REPORT ON THE ENERGY SITUATION IN SLOVENIA

2022

Agencija za energijo

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FOREWORD

MAG. DUŠKA GODINA

DIRECTOR

Energy is a commodity. It is vital for our daily activities and it enables us to live with dignity. It is key to the functioning of the economy and ensuring the economic conditions that make it affordable and, therefore, prosperous. This is why energy policy aims for a reliable, high-quality and affordable energy supply. Climate change is such a significant challenge that all 27 Member States have committed to making the European Union (EU) the first climate-neutral continent by 2050. They have set firm and ambitious targets to reduce greenhouse gas emissions, including by increasing the use of renewable energy and reducing energy consumption.

By 2022, the energy sector was operating in a relatively stable and predictable environment, with no major disruptions to the energy supply. Energy was affordable, and we were confident that nothing could surprise us. But last year, the energy sector found itself in very different circumstances. The recovery from the pandemic had already seen wholesale prices rise in 2021, and the tense geopolitical situation in Europe had led to an uncontrolled rise in natural gas prices, and thus electricity prices, over the past year. European and global energy exchange prices went wild, and distrust in markets and trading increased. In August last year, the electricity prices soared to an unimaginable EUR 1,000 per MWh. Despite environmental targets, fossil fuel power plants that had already been decommissioned had to be put into operation and emission allowance prices reached record highs. We have entered an era of soaring energy prices and energy dependency awareness.

In response to this situation, the European Commission published the REPowerEU plan in May 2022, highlighting an accelerated transition to clean energy, an increased diversification of sources and energy saving as key actions to rapidly reduce the EU's dependence on Russian fossil fuels and ensure affordable energy.

The European Commission considers that the measures have been effective. The EU's dependence on Russian fossil fuels has been reduced and most of the natural gas supplied through pipelines from Russia until the start of the energy crisis has been replaced by other sources in less than eight months. Nearly 20% of the energy savings have been achieved through consumption-reduction measures. A price cap on the purchase of natural gas and oil was introduced, which had an immediate and significant impact on the prices of some energy products.

The coordinated filling of EU natural gas storage facilities has also contributed to stabilising the natural gas prices ahead of the winter period, ensuring a reliable supply of natural gas and, in some cases, sufficient electricity production. The target of 80% European storage capacity was reached two months before the heating season, and in November, storage capacity was already at 96%. In the context of the favourable weather conditions that delayed the heating season, the rational use of gas in industry and the replacement of natural gas with alternative fuels were other key measures to achieve security of supply.

In parallel, the EU has also seen an increase in electricity generation from renewable energy sources. Figures on the promotion of investment in renewables show that the EU has built 41 GW of new solar power plants, increased wind capacity by 16 GW and, together with other existing renewables, accounted for 39% of the EU's total electricity consumption.

Slovenia has also followed through on its commitments, with electricity and natural gas consumption falling and, despite late commitments, Slovenian suppliers having secured 11% of the average natural gas consumption in storage by November. Gas imports from Algeria have resumed and will cover about one-third of Slovenia's annual consumption over the next three years.

The Government has also taken several measures to mitigate the pressure of rising energy prices. It has significantly reduced the cost of energy supply for households and certain protected groups of consumers by lowering taxes, excise duties and contributions, as well as capping the price of electricity and natural gas. The extremely high energy prices on the wholesale markets have had an adverse impact on the performance of suppliers in retail markets, including in our own country. The Government has responded effectively to this situation by introducing an alternative supply to ensure that all customers who would be left without a supplier in such a situation are automatically switched to another supplier.

Unfortunately, the estimated share of renewables in the gross final energy consumption for 2022 is only 23%, 2.4 percentage points below the 2022 target. While solar power plants accounted for 49% more electricity generation than in 2021, poor hydrology, particularly last autumn, reminded us of the volatility and weather dependence of renewables. We generated 5.8 percentage points less electricity from renewables, fossil fuel generation was also down due to the temporary shutdown of TEŠ 6, and in 2022 we recorded our lowest electricity generation in five years and also our lowest self-sufficiency, importing more than 30% of our electricity for domestic consumption. At the same time, consumer interest in self-supply is growing significantly. At the end of last year, more than 27,000 such installations were in operation, with a total capacity of 350 MW. Unfortunately, a quarter of all the connection applications were rejected due to grid constraints.

At the time of writing, the National Assembly has adopted two important laws that could help to accelerate the deployment of renewable energy generation facilities in the country and the use of alternative fuels in transport. In this context, it will be crucial to consider the state of the electricity network. The estimated resources needed in the ten-year development plans of the electricity operators amount to more than EUR 3.5 billion. But by using the networks efficiently and changing our habits in small ways, we can impact these costs while allowing renewables and other loads to be integrated more quickly into the system. This is why the Energy Agency introduced a new network charging methodology last November, which will apply from 1 March 2024. Through price signals in individual time blocks and the gradual charging of excess capacity, this new way of charging will encourage customers to shift their consumption to periods when the network is less stressed. The load on the network provides the signals for the necessary reinforcements of the network.

The increase in the world population and the even more accelerated growth of the global economy have resulted in a multi-fold increase in energy consumption over the last 50 years. Scientists have noted that greenhouse gas emissions from burning fossil fuels reached and exceeded the self-cleaning capacity of the entire global atmosphere several decades ago.

Significant social changes will be needed, including in attitudes to energy. We may indeed be, as Dr Plut shows and teaches us in his recent monograph, on the threshold of a new ecosystem-based social order, which must be based, among other things, on a reduction in the current excessive consumption of primary and final energy, abandoning the use of fossil fuels and a responsible rethinking of the use of nuclear energy, as well as the thoughtful siting of production facilities in the environment. This is the only way to achieve the goal of a sustainable energy supply and to ensure living conditions for the generations that come after us. This last is the responsibility of every society because a society that does not think about future generations has no future.

Thank you to all the energy market participants for providing the data, and thank you to the Energy Agency's staff who, by carefully processing and analysing this data, produce this extraordinarily comprehensive and high-quality report each year.

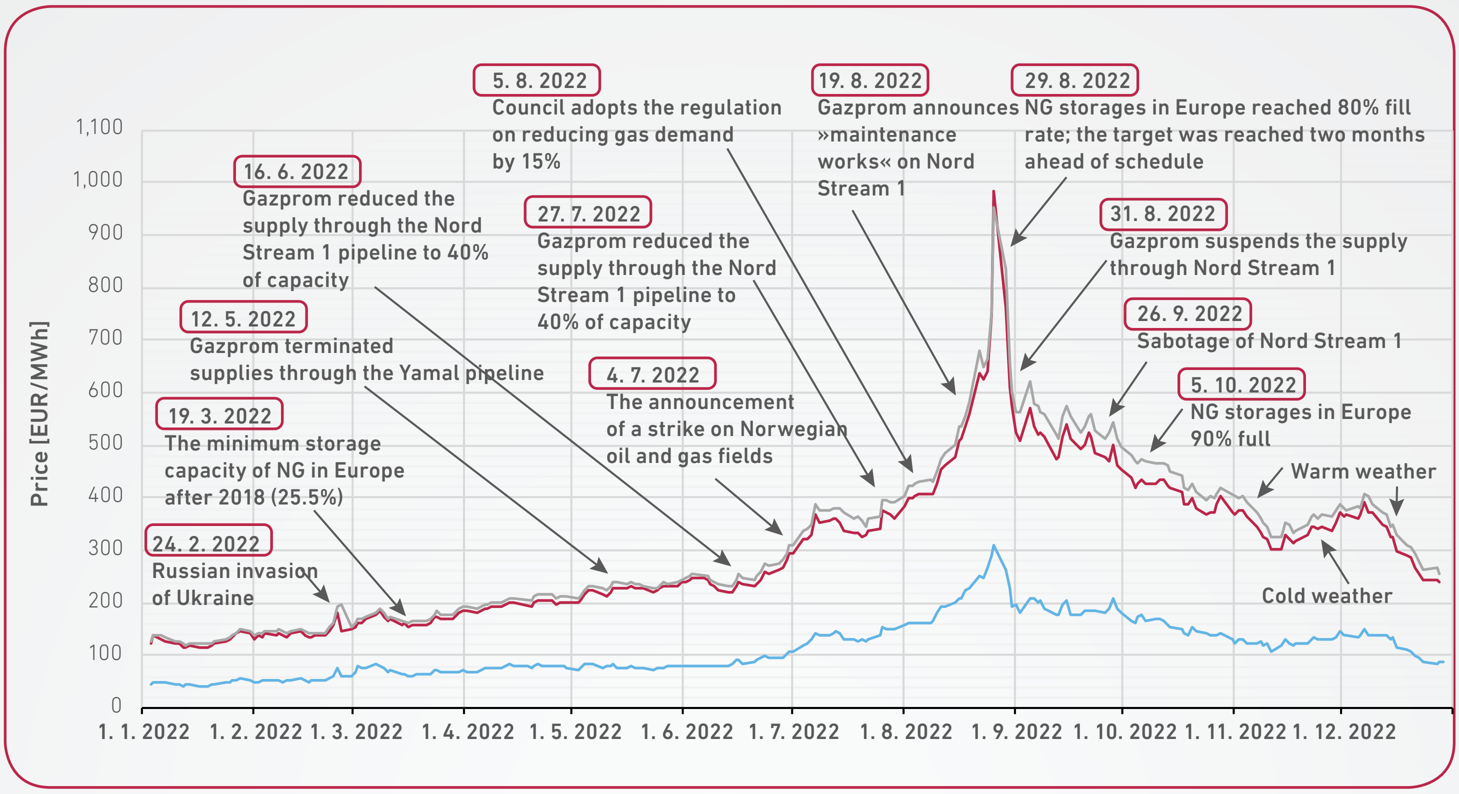
HOW WE TACKLED THE ENERGY CRISIS

The upward trend in electricity and natural gas prices in the wholesale markets, which was already present in the second half of 2021, continued in the past year. The price increases have been recorded since practically the beginning of the year, with the prices on the exchanges peaking in August. However, the past year has yet to be characterised by rising energy prices alone. The war in Ukraine and the related heightened geopolitical situation have severely shaken the global energy market, and the European Union's (EU) dependence on gas, oil and coal imported from Russia has come to the fore. Concerns about energy security have increased in the EU, and the security of supply has become a pressing issue. The EU has sourced 40% of its natural gas from Russia in recent years, and the dependence of individual Member States on Russian fossil fuels, and hence their vulnerability, varies from one Member State to the next.

In 2021, consumers in Slovenia were supplied with more than 85% of their gas from Austria, which in turn was heavily dependent on gas imports from Russia. In the autumn of 2021, there were indications that the storage facilities used by Gazprom in Europe were insufficiently filled, leading to speculation about the security of supply for the 2021/22 winter period. Russian gas flows to Europe via the Yamal pipeline have decreased weekly since October 2021 and subsequently via other supply routes. There were legitimate questions about whether the gas from Europe's abundant storage facilities would be sufficient, without additional refills, to ensure the security of supply, which had been very high throughout the EU up to that point. Russian gas imports via Ukraine have also been gradually reduced since February 2022 and the Nord Stream 1 gas pipeline was totally cut off in September 2022. At the EU level, Member States launched urgent new activities to switch to other gas sources and new suppliers, securing supplies of Norwegian gas, LNG and, to a lesser extent, gas from North Africa and Central Asia. LNG imports were mainly via transport routes through Germany and Italy. Slovenia has taken an active approach to ensuring the security of supply by agreeing on additional gas supplies from Algeria and possible gas supplies from the LNG terminal at Krk island.

The increased risk of natural gas shortages has also put pressure on electricity prices, as natural gas is used for power generation in many EU countries.

FIGURE 1: GAS SUPPLY MILESTONES IN THE DEVELOPMENT OF PRICES FOR LONG-TERM PURCHASES OF NATURAL GAS AND ELECTRICITY



SOURCES: ENERGY AGENCY, MONTEL, GIE AGSI

The EU Legal Framework and the Impact of Measures to Mitigate the Energy Crisis

As early as October 2021, the European Commission (EC) set out a set of measures and tools to tackle the rising energy prices[1], showing Member States how to quickly mitigate the effects and improve the situation for vulnerable consumer groups without interfering with markets or undermining incentives to move towards a climate-neutral society.

Among the short-term and time-limited measures proposed were reduced tax rates for vulnerable groups, measures to reduce energy costs for all energy end-users and the possibility of providing aid to companies or industries to help them cope with the crisis, with full respect of the state aid framework. At the same time, countries were also required to voluntarily reduce their gas, electricity and heat consumption.

In addition to temporary energy price regulation, short-term support for companies affected by high energy prices are permissible under EU state aid rules. To ensure that consumers have confidence in the functioning of the market despite the rising and volatile prices, the EC has called on the competent institutions at the EU and national levels to ensure transparency and integrity in the functioning of the markets to address concerns about manipulative or abusive practices.

In cooperation with all the national regulators, ACER examined the benefits and drawbacks of the existing electricity market design and published an opinion[2] at the end of April 2022, focusing on the longer-term development and adaptation of the EU wholesale electricity market design. Indeed, long before the crisis, the appropriateness of the wholesale market design in the light of the clean energy transition was debated in expert, academic and policy circles. ACER concludes that the current wholesale electricity market design ensures an efficient and secure electricity supply under

1 Communication from the commission to the european parliament, the european council, the council, the european economic and social committee and the committee of the regions tackling rising energy prices: a toolbox for action and support COM(2021) 660 final; EUR-Lex - 52021DC0660 - EN - EUR-Lex (europa.eu)

2 Final_Assessment_EU_Wholesale_Electricity_Market_Design.pdf (europa.eu)

relatively normal market conditions and therefore considers that the current market design is worth maintaining. ACER believes that the design of the electricity market is not to blame for the energy crisis and that the current market rules have helped to mitigate the crisis to a certain extent, preventing the curtailment of electricity consumption or even blackouts in some parts of the EU.

Risks related to the security of supply and access to energy products, particularly natural gas, have further spurred agreements in the EU, and the EC published the REPowerEU plan in May 2022. This coordinated agreement between EU Member States highlights an accelerated transition to clean energy, an increased diversification of sources and energy saving as key measures to rapidly reduce the EU's dependence on Russian fossil fuels and ensure affordable energy. Solidarity and cooperation between Member States is also essential.

To ensure an affordable energy supply for the next year, **Council Regulation (EU) 2022/1854 on an emergency intervention to address high energy prices**[3] was adopted, which includes voluntary targets of a 10% reduction in the total gross electricity consumption and a binding target of a 5% reduction in peak electricity consumption, as well as a profit levy and a solidarity contribution. The Regulation also sets a cap of EUR 180/MWh on the market revenues of electricity generators using so-called inframarginal technologies such as renewables, nuclear and lignite to produce electricity. Certain flexibility mechanisms have been included in the Regulation to take account of the national circumstances. In addition, the Regulation provides for a time-limited compulsory solidarity contribution to companies' profits in the oil, gas, coal and refining sectors. These are temporary specific measures applicable from 1 December 2022 to 31 December 2023. The energy reduction targets apply until 31 March 2023. The mandatory cap on market revenues applies until 30 June 2023.

Council Regulation (EU) 2022/2578 Establishing a market correction mechanism to protect citizens and the economy against excessively high prices[4] provides temporary emergency measures to introduce a market correction mechanism – often referred to as a gas price corridor – for the prices of certain gas transactions in the Title Transfer Facility (TTF) in the Netherlands. This cap can be triggered if the price on the TTF exchange reaches EUR 180/MWh and exceeds the reference price for LNG calculated by ACER by EUR 35 over a certain period. The Regulation entered into force following lengthy negotiations in February 2023. The mechanism can be activated as of 15 February 2023.

Council Regulation (EU) 2022/1369 on coordinated demand-reduction measures for gas[5] required the Member States to do their best to reduce their gas consumption in the period from 1 August 2022 to 31 March 2023 by at least 15% compared to the average gas consumption in the period from 1 August to 31 March in the five consecutive years preceding the entry into force of the Regulation. The competent authorities in the Member States monitored the measures and the monthly gas consumption. The voluntary gas reduction measure was extended until 31 March 2024 at the beginning of 2023.

Under **Council Regulation (EU) 2022/2576 enhancing solidarity through the better coordination of gas purchases, reliable price benchmarks and exchanges of gas across borders**[6], the Member States and energy companies will be able to purchase gas jointly in the future. Demand aggregation at the EU level aims to ensure that EU Member States have more influence in purchasing gas on world markets without being overtaken by each other. The Regulation introduces additional solidarity measures in case of a gas supply shortage, complementing the existing rules. The Member States can now request solidarity measures from other Member States if they cannot supply the critical quantities of gas they need for their electricity system. The Regulation also includes measures to limit volatility in gas and electricity prices and establishes reliable benchmarks for gas prices. The Regulation entered into force at the end of December 2022 and can be applied for one year from its entry into force.

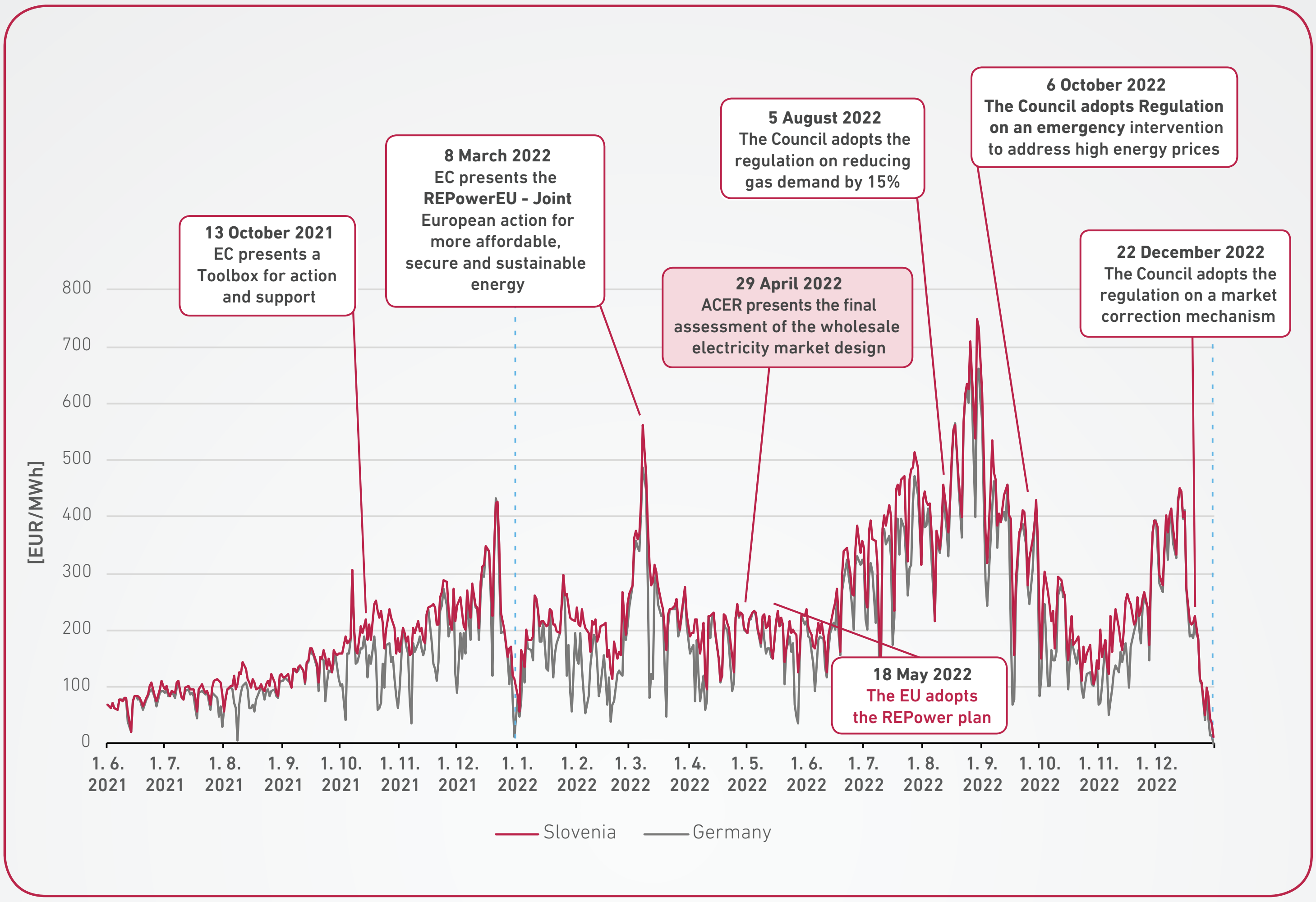
3 Uredba Sveta (EU) 2022/1854 z dne 6. oktobra 2022 o nujnem posredovanju za obravnavo visokih cen energije; https://eur-lex.europa.eu/legal-content/SL/TXT/HTML/?uri=CELEX:32022R1854

4 Council Regulation (EU) 2022/2578 of 22 December 2022 establishing a market correction mechanism to protect Union citizens and the economy against excessively high prices; https://eur-lex.europa.eu/legal-content/SL/TXT/HTML/?uri=CELEX:32022R2578

5 Council Regulation (EU) 2022/1369 of 5 August 2022 on coordinated demand-reduction measures for gas; https://eur-lex.europa.eu/legal-content/SL/TXT/?uri=CELEX:32022R1369

6 Council Regulation (EU) 2022/2576 of 19 December 2022 enhancing solidarity through the better coordination of gas purchases, reliable price benchmarks and exchanges of gas across borders; https://eur-lex.europa.eu/legal-content/SL/TXT/HTML/?uri=CELEX:32022R2576

FIGURE 2: EU IN ACER RESPONSE TO DEVELOPMENTS IN WHOLESALE ELECTRICITY MARKETS



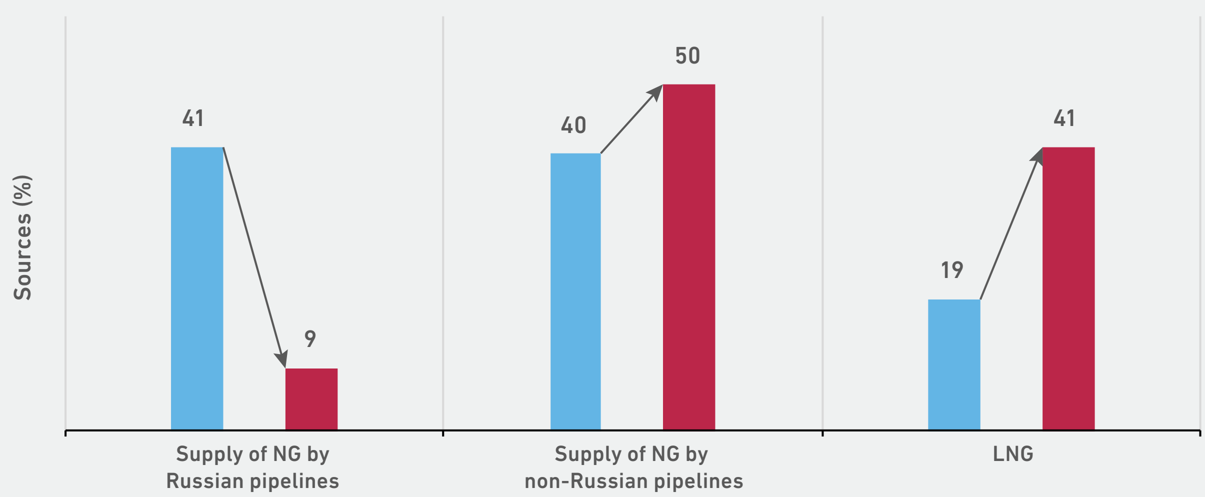
SOURCES: ENERGY AGENCY, MONTEL

At the beginning of 2023, the EC published the key achievements of the REPowerEU actions. According to the EC, the EU has significantly reduced its dependence on Russian fossil fuels, saved almost 20% of its energy by reducing energy consumption, introduced a price cap on the purchase of natural gas and oil, and increased electricity production from renewable energy sources[7]. EU action ensured that most (80%) of the natural gas supplied through pipelines from Russia until the start of the energy crisis was replaced by other sources in less than eight months.

The EU has thus concluded several agreements, e.g. with Egypt, Namibia and Kazakhstan – a strategic partnership for the sustainable supply of green hydrogen – and with Middle Eastern countries – Israel and Egypt – for the supply of natural gas.

7 REPowerEU: affordable, secure and sustainable energy for Europe (europa.eu)

FIGURE 3: DIVERSIFYING EU GAS SUPPLIES



SOURCE: EUROPEAN COMMISSION

The coordinated filling of EU natural gas storage facilities has been among the measures that have had a major impact on stabilising natural gas prices ahead of the 2022/2023 winter period and ensuring the security of the natural gas supply and, in some cases, sufficient electricity generation. The EC target of 80% storage capacity on 1 November 2022 was already reached at the end of August 2022 – well ahead of the heating season. Storages were still filling up at the beginning of November 2022, when occupancy peaked at 96%.[8] In addition to favourable weather delaying the heating season, the rational use of gas in industry and replacing natural gas with alternative fuels were key measures to achieve this target.

FIGURE 4: NATURAL GAS STORAGE CAPACITY IN THE EU

SOURCE: EUROPEAN COMMISSION

8 According to Gas Infrastructure Europe, the maximum storage capacity was reached on 13 November 2022 and 80% capacity was reached as early as 29 August 2022; Gas Infrastructure Europe – AGSI (gie.eu)

To ensure the security of the supply in years to come, a storage capacity of at least 90% on 1 November is also required for the following gas years.

The accelerated financing of the green transition foreseen by REPowerEU will provide close to EUR 300 billion – around EUR 72 billion in grants and around EUR 225 billion in loans. The main source of funding for the programme will come from the Recovery and Resilience Facility (RRF)[9], a temporary instrument of the EU's broader NextGenerationEU[10] plan to make the EU stronger and more resilient in the aftermath of the pandemic and the energy crisis in 2022.

In stimulating investment in renewables, figures show that the EU has built 41 GW of new solar power plants, increased wind capacity by 16 GW and, together with other existing renewables, accounted for 39% of the EU's total electricity consumption.

The Legal Framework of the Republic of Slovenia and the Effects of Measures to Ensure the Security of Supply and Mitigate Energy Prices

Ensuring the Security of Supply

Increased Diversification of Sources

The Government of the Republic of Slovenia (the Government) participated in the adoption of measures in the Council of the EU and then followed the EU recommendations in both markets in the second half of 2021. The dynamics of activities started in the gas area after Slovenia signed a solidarity agreement on gas supply assistance with Italy and continued negotiations with Croatia and Austria. Cooperation with other countries such as Croatia, Austria and Hungary has also increased, as has the search for new suppliers outside Europe. These measures aimed to diversify gas supplies to reduce the dependence on a single supplier. The TSOs have developed new proposals to build additional gas pipeline links, one creating a transmission corridor from Italy to Hungary and the other from Croatia to Austria, connecting the Slovenian gas network to the Croatian LNG terminal on the island of Krk. This link would provide an alternative gas source for Slovenia and contribute to the diversification of gas suppliers and transmission routes. A partial upgrade of the Šempeter interconnection point has been carried out and will be completed in 2023, allowing sufficient gas to be transported from the west even during colder periods. Gas imports from Algeria were restarted in 2022 and will cover about one-third of the annual consumption over the next three years. Algeria and Italy supplied 10% of the gas needed by Slovenian gas consumers. In 2022, the dispersion of gas sources increased.

Resumed gas supplies from Algeria

Mandatory Storage of Natural Gas

Due to the high risk of gas shortages in the upcoming gas year of 2022/2023, especially in the colder period, the leaders of the balance groups were obliged by the Act on Measures for the Management of Crisis Conditions in the Field of Energy Supply (ZUOKPOE)[11] to compulsorily store gas in an amount equal to at least 15% of the average annual gas supply of this balance group to final consumers in the Republic of Slovenia in the last five calendar years preceding the current year. The Energy Agency has received data from the balance group leaders on the quantities of gas stored on 1 November 2022 and supporting documents proving the quantities stored. The data received showed that all the balancing group leaders supplying Slovenian consumers had 11% of their average consumption of the last five years stored. The majority of the gas was stored in Austria and Croatia by the balancing group leaders.

9 The Recovery and Resilience Facility; Recovery and Resilience Facility (europa.eu)
10 NextGenerationEU; NextGenerationEU (europa.eu)
11 Act on Measures for the Management of Crisis Conditions in the Field of Energy Supply (ZUOKPOE) (Official Gazette of the Republic of Slovenia, Nos 121/22 in 49/23)

Reducing Natural Gas Consumption

On 12 July 2022, the Energy Agency, as the competent authority, declared an early warning level for gas supply in Slovenia based on analyses of the market situation and conditions. While the gas supply and gas transmission to Slovenia were uninterrupted, gas suppliers informed their industrial customers that if a higher level of crisis is declared, gas consumption may be reduced or interrupted or, if they have the option, they may switch to alternative energy sources. Suppliers urged their customers to use gas more rationally, and the Energy Agency urged consumers to consider and find solutions to replace gas with other energy sources.

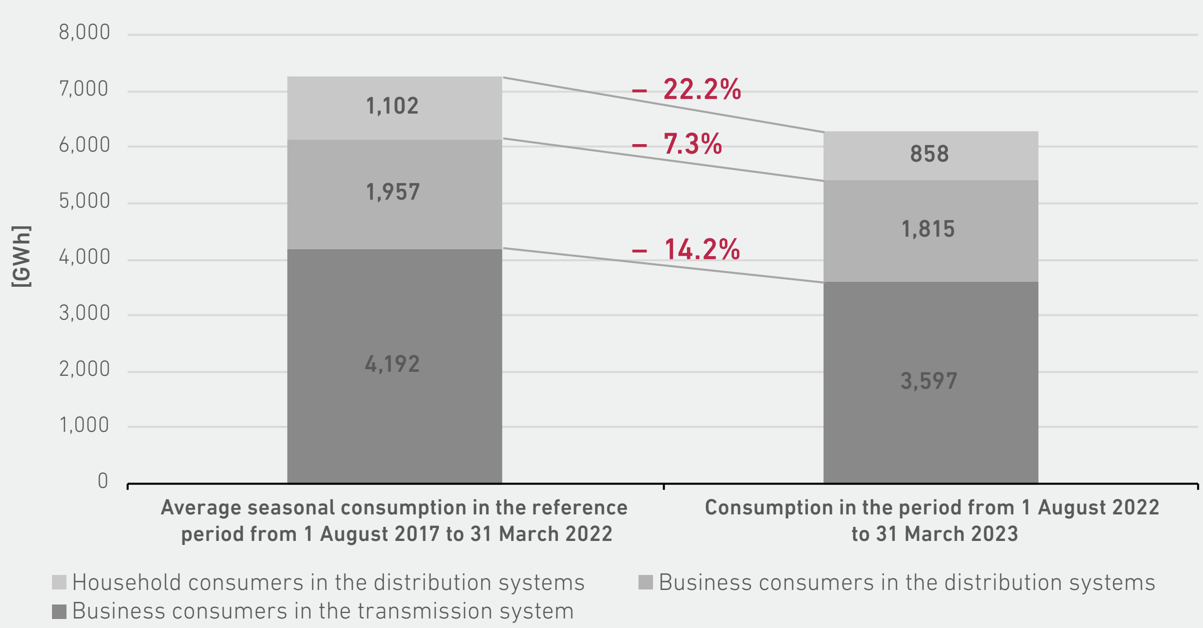
On 12 July, the Energy Agency announced an early warning stage – consumers were urged to use natural gas rationally and consider switching to another energy source

The EU-level measures have had a noticeable impact in 2022 and in the winter season until the end of March 2023. In line with Council Regulation (EU) 2022/1369 on coordinated action to reduce gas demand, Member States aimed to reduce their gas consumption by 15% compared to the average gas consumption over the reference period. These reductions significantly reduced the risks of gas shortages in the Member States and at the EU level during the winter season. Member States implemented voluntary measures, which had an impact. By the end of March 2023, gas consumption at the EU level had been reduced by around one-fifth in the winter season compared to the previous five years, which is higher than the required 15% reduction. The reductions achieved varied widely across Member States.

A 13.7% reduction in gas consumption in the period from 1 August 2022 to 31 March 2023 compared to consumption in the reference period of the previous five years

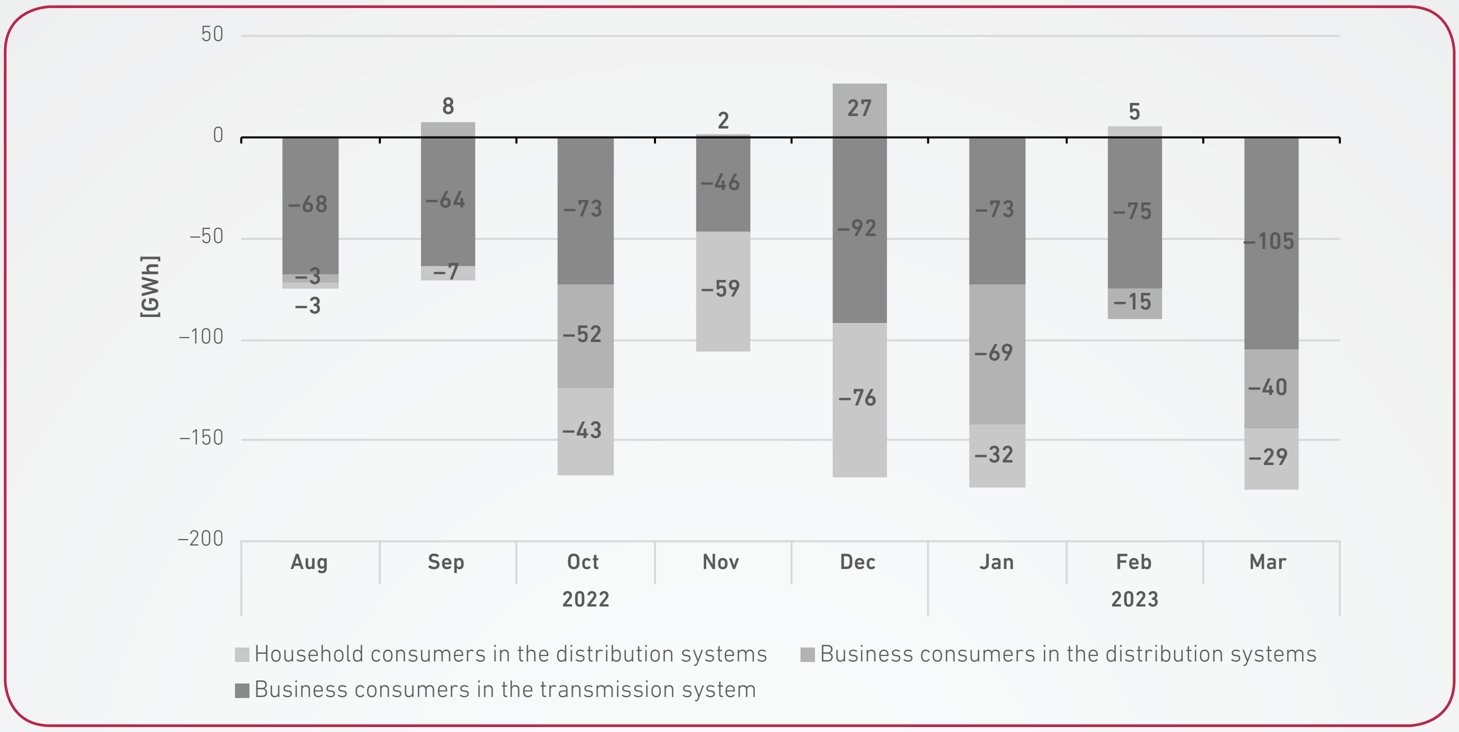
The Energy Agency monitored the actions and published the findings every month. From 1 August 2022 to 31 March 2023, Slovenia reduced its gas consumption by 13.7% compared to the consumption in the reference period. The largest reduction in gas consumption was in households, which consumed 22.2% (or 244 GWh) less gas compared to the reference period. Other consumers on distribution systems consumed 7.3% (or 142 GWh) less gas, and business consumers connected to the transmission system consumed 14.2% (or 595 GWh) less gas than in the reference period.

FIGURE 5: NATURAL GAS CONSUMPTION IN THE PERIOD FROM 1 AUGUST 2022 TO 31 MARCH 2023 COMPARED TO THE REFERENCE PERIOD



SOURCE: ENERGY AGENCY

FIGURE 6: MOVEMENT OF THE MONTHLY CONSUMPTION OF INDIVIDUAL GROUPS OF NATURAL GAS CONSUMERS IN THE PERIOD FROM 1 AUGUST 2022 TO 31 MARCH 2023 COMPARED TO THE REFERENCE PERIOD



SOURCE: ENERGY AGENCY

The Legal Basis for Managing Emergency Situations Affecting Natural Gas Supply

The Energy Agency has prepared an updated Emergency Plan and determined a new order of reduction and interruption of gas supply to consumption groups, taking into account the purpose for which gas is consumed at each delivery point, as well as the economic importance of the consumer or its impact on the provision of goods or services of national importance.

The Energy Agency has also adopted a methodology for calculating the gas price in the event of the involuntary reduction or interruption of gas supply[12], and a methodology for calculating compensation in the event of the involuntary reduction or interruption of gas supply[13].

Plinovodi vzpostavili enoten informacijski sistem

The Energy Agency has prepared all the necessary legal basis for a possible emergency situation

The TSO has established a unified information system, making the data necessary for managing the crisis easier to access and use.

The TSO has set up a single information system to make the data needed for crisis management more accessible and usable.

An inter-state agreement on solidarity measures to ensure the security of the gas supply between Slovenia and Italy was signed. A similar agreement has been technically coordinated with Croatia, while negotiations on a similar agreement with Austria are ongoing.

In order to work in a coordinated way on the security of supply across the EU, the European Commission has set up a Gas Coordination Group for information exchange and coordination. Good co-

12 Legal Act on the methodology for calculating the gas price in the event of the involuntary reduction or interruption of gas consumption (Official Gazette of the Republic of Slovenia, No 136/22)

13 Legal Act on the methodology for calculating compensation in the event of the involuntary reduction or interruption of gas consumption (Official Gazette of the Republic of Slovenia, No 136/22)

operation and coordinated action have contributed significantly to ensuring that there were no shortages of gas in the EU in the 2022/23 heating season and that there was sufficient gas available in storage. The Gas Coordination Group involves the Energy Agency and the Ministry responsible for energy.

To test the functioning of the Crisis Group and the response to the different stages of a crisis, the Energy Agency carried out a two-day exercise in September 2022, which showed that we are well prepared for a possible gas shortage. It also showed that how the stakeholders and the Crisis Group communicate with each other could be improved, and this has been taken into account in the new Emergency Plan. An EU-wide exercise was also carried out in December 2022 to test the response of individual countries to two weeks of particularly low temperatures, such as those experienced over the last 20 years, with reduced gas supplies to the EU. Slovenia participated in the exercise and demonstrated the good preparedness of the team that would lead the crisis team and coordinate actions at the national and EU levels.

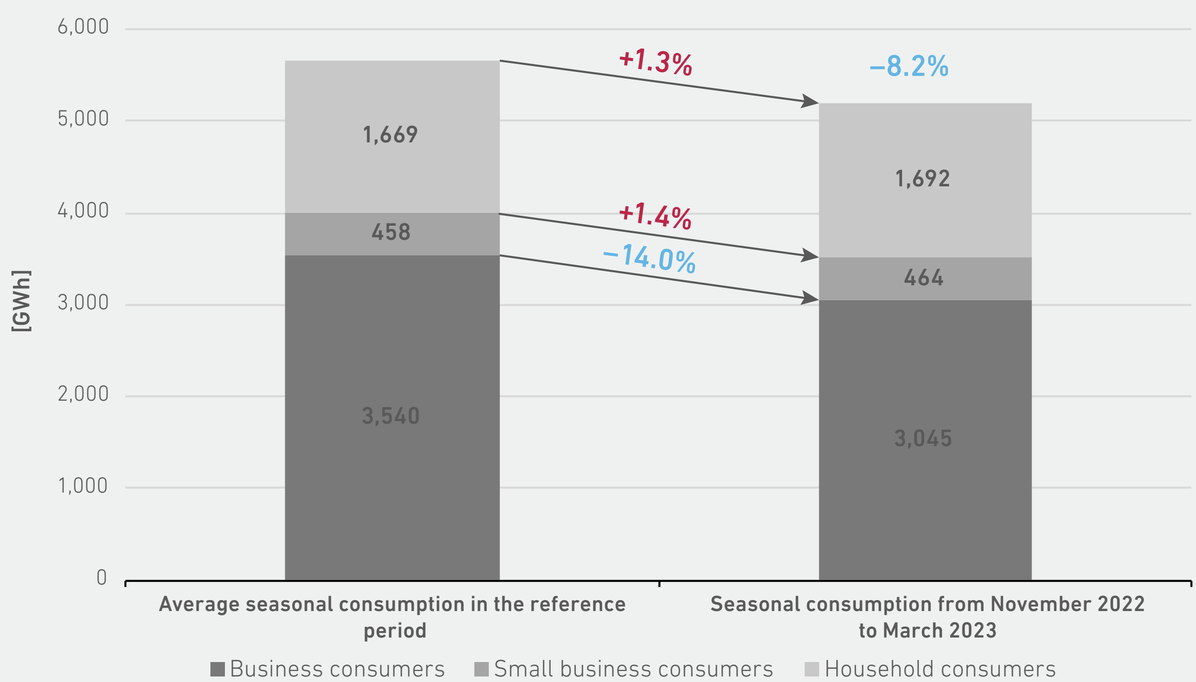
A solidarity agreement signed between Slovenia and Italy

Reducing Electricity Consumption

Following Council Regulation (EU) 2022/1854 on the emergency intervention to address high energy prices, the Member States have endeavoured to implement measures to reduce their total monthly gross electricity consumption by 10% over the period from 1 November 2022 to 31 March 2023, compared to the average gross electricity consumption in the corresponding months of the reference period (five consecutive years starting from the period from 1 November 2017 to 31 March 2018).

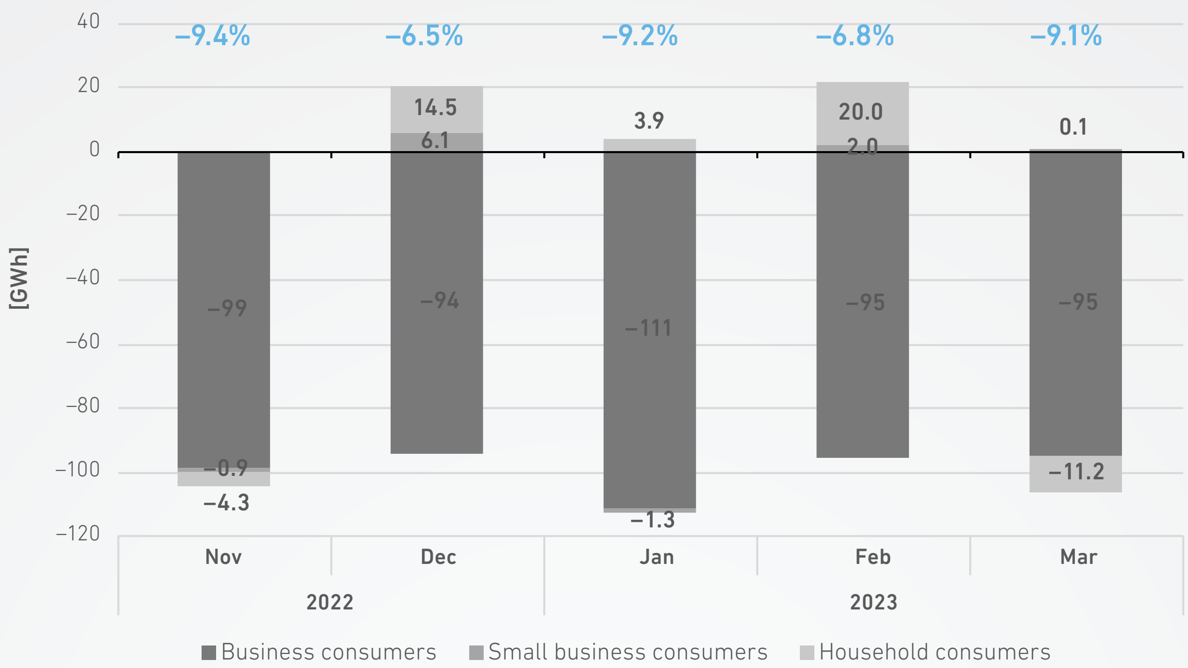
Electricity consumption from 1 November 2022 to 31 March 2023 has decreased by 8.2% (or 466 GWh) compared to the same period in the last five years (2017–2022). The decrease in consumption is due to reduced consumption by large business consumers of 14% (or 466 GWh). Consumption was higher for household and small business consumers, by 1.4% (or 23 GWh) for household and 1.3% (or 6 GWh) for small business consumers.

FIGURE 7: ELECTRICITY CONSUMPTION FROM 1 NOVEMBER 2022 TO 31 MARCH 2023 COMPARED TO THE REFERENCE PERIOD



SOURCE: ENERGY AGENCY

FIGURE 8: MONTHLY AMOUNT OF EACH FORM OF ELECTRICITY CONSUMPTION COMPARED TO THE REFERENCE PERIOD



SOURCE: ENERGY AGENCY

Mitigating the Impact of High Energy Prices

Over the past year, several measures have been taken to mitigate the impact of the high energy prices on households and the business sector. The following briefly summarises the electricity and natural gas supply measures that have significantly affected household and small business consumers.

EUR 94 million less income for electricity operators due to the measure of a three-month exemption from paying the network charge

February 2022 – Act Determining Emergency Measures to Mitigate the Consequences of the Impact of High Energy Commodity Prices (ZUOPVCE)[14]:

- payment of a one-time solidarity allowance to alleviate the effects of energy poverty to certain beneficiaries;
- temporary exemption from the payment of the contribution for the provision of support for the production of energy from high-efficiency cogeneration and renewable energy sources for final consumers in the low-voltage with unmetered power consumption group and household electricity consumers from 1 February 2022 to 30 April 2022;
- reducing the amount of excise duties on energy products and electricity from 1 February 2022;
- the adoption of a measure for electricity consumers not to pay network charges for the electricity distribution and transmission system from 1 February to 30 April 2022;
- equalisation of the rights of all household gas consumers, both individual consumers and those who use gas in shared boiler rooms for heating.

In the second half of the year, the Government's actions were targeted at the permitted support for consumers, the business sector and also suppliers of electricity or natural gas.

14 Act Determining Emergency Measures to Mitigate the Consequences of the Impact of High Energy Commodity Prices (Official Gazette of the Republic of Slovenia, No 29/22)

July 2022 – Decree on the Determination of Electricity Prices[15]

A maximum permitted electricity price for household and small business customers (up to 43 kW connection capacity) was set for the period from 1 September 2022 to 31 August 2023. The measure was extended in 2023 until the end of 2023.[16] The maximum retail price for electricity for household consumers and consumption in the common areas of multi-apartment buildings and common areas in mixed multi-apartment buildings was set at 0.11800 EUR/kWh for the higher daily tariff, 0.08200 EUR/kWh for the lower daily tariff and 0.09800 EUR/kWh for the uniform daily tariff.

Suppliers responded to the Decree by setting the prices of their offers at the limit of the maximum allowed electricity price. As of 1 October, only one electricity supplier offered a retail electricity price below the regulatory maximum (the only bid below the maximum was the price of the lower daily tariff).

July 2022 – Decree on Setting Gas Prices from the System[17]

A maximum retail price of natural gas was set for household and small business consumers and for consumers where gas is used in shared boiler rooms (multi-apartment buildings, kindergartens, schools, primary social services, etc.). The maximum permitted natural gas prices were valid from 1 September 2022 to 31 August 2023. The measure was extended until the end of 2023.[18] The maximum permitted retail price for natural gas for households and joint household consumers was EUR 0.073/kWh.

From 1 September onwards, suppliers gradually adjusted their offers to the maximum permitted price of natural gas by setting their offer prices at the limit of the maximum permitted retail price of natural gas. Suppliers that still had higher retail prices in August 2022 reduced their retail prices in September to the capped retail price of natural gas. On the other hand, the remaining suppliers have gradually increased their retail natural gas prices since September. All the suppliers set their retail natural gas prices at the ceiling in December.

In **January 2023**, the **Decree on Setting the Price for District Heating**[19] **set the maximum tariff for the variable part of the district heating price for households at 98.7 EUR/MWh, and did not allow any increase in the heat tariff. The measure was in force from 1 January to 30 April 2023**.

January, April, July 2022 – Decree Determining the Amount of Excise Duty on Energy Products and Electricity[20]

Reduction of the amount of excise duty on electricity and heating energy products (fuel oil and natural gas) by half from 1 February 2022. The measure was extended in April and July 2022 after its adoption in January 2022.

August 2022 – Decree on the Method of Determining and Calculating the Contribution for Ensuring Support for the Production of Electricity from High-Efficiency Cogeneration and Renewable Energy Sources[21]

A temporary 50% reduction of the contribution for the provision of support for the production of electricity from high-efficiency cogeneration and renewable sources (RES and CHP contribution) for the period from 1 September 2022 to 31 August 2023.

September 2022 – Act Determining Emergency Measure in the Field of Value-Added Tax to Mitigate the Increase in Energy Prices (ZNUDDVE)[22]

For the period 1 September 2022 to 31 May 2023, a reduced VAT rate was implemented, with the VAT rate reduced to 9.5% instead of 22% for all consumers of electricity, natural gas, district heating and purchasers of fuel wood.

15 Decree on the determination of electricity prices (Official Gazette of the Republic of Slovenia, Nos 95/22 in 98/22)
16 Decree on the determination of electricity prices (Official Gazette of the Republic of Slovenia, No 45/23)
17 Decree on setting gas prices from the system (Official Gazette of the Republic of Slovenia, Nos 98/22, 138/22 in 12/23)
18 Decree on setting gas prices from the system (Official Gazette of the Republic of Slovenia, Nos 45/23)
19 Decree on setting the Price for District Heating (Official Gazette of the Republic of Slovenia, No 9/23)
20 Decree determining the Amount of Excise Duty on Energy Products and Eelectricity (Official Gazette of the Republic of Slovenia, Nos 99/22, 6/23, 13/23, 19/23, 26/23, 36/23 in 47/23)
21 Decree on the Method of Determining and Calculating the Contribution for Ensuring Support for the Production of Electricity from High-Efficiency Cogeneration and Renewable Energy Sources (Official Gazette of the Republic of Slovenia, Nos 184/21, 84/22, 86/22 in 112/22)
22 Determining Emergency Measure in the Field of Value-Added Tax to Mitigate the Increase in Energy Prices (Official Gazette of the Republic of Slovenia, No 114/22)

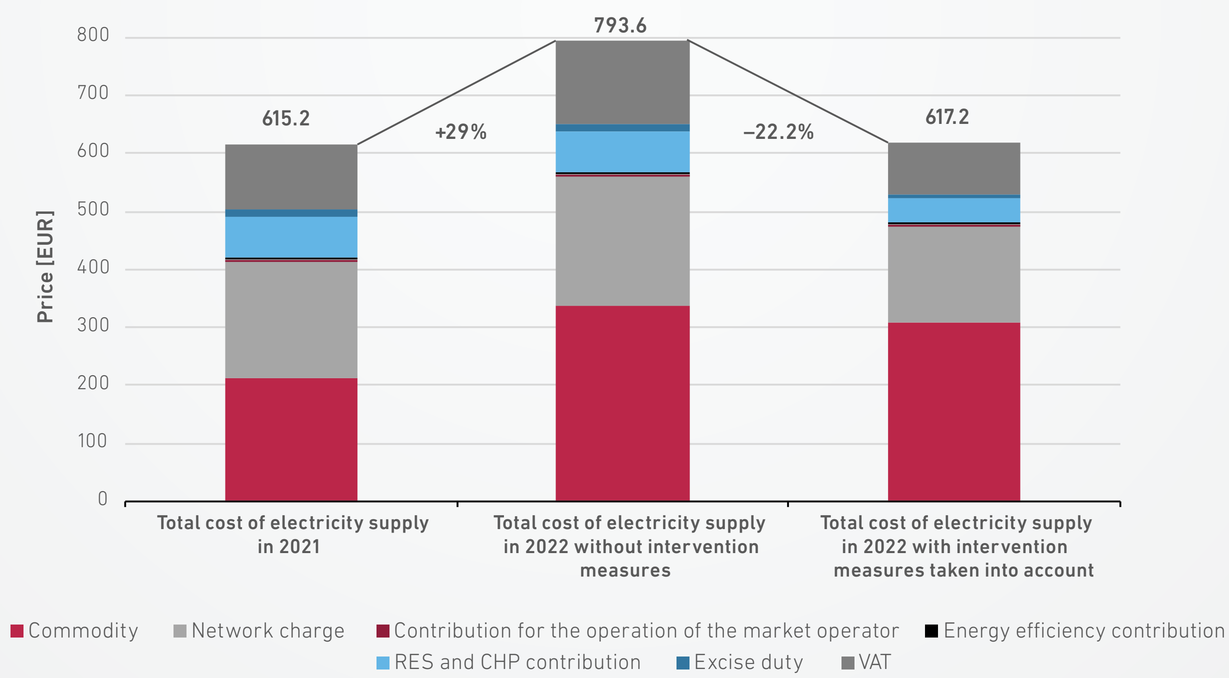
June and September 2022 – Decree Amending the Decree on the Environmental Tax on Air Pollution Caused by Carbon Dioxide Emissions[23]

The cost of electricity and natural gas supply would be significantly higher for certain groups of consumers without the intervention measures

Temporary suspension of the obligation to pay the environmental tax on carbon dioxide emissions for certain fossil fuels – gas, oil, petrol, heating oil and natural gas – from 21 June 2022 to 1 August 2022 and from 13 September 2022 to 9 May 2023.

According to the Energy Agency's calculations, these intervention measures alleviated the pressure of the high prices on the annual cost of electricity supply for the average household consumer[24] by EUR 176.4. Without the intervention measures, the annual cost of electricity supply for the average household consumer would have been EUR 793.6, while with the intervention measures taken into account, it would have been EUR 617.2. This represents a 22.2% reduction in the annual cost of electricity compared to the calculation without the intervention measures. In 2021, the annual cost of electricity supply for an average household consumer was EUR 615.2. Without the intervention measures, the annual cost of electricity supply in 2022 would have been 29% higher, while after the intervention measures, the annual cost of electricity supply in 2022 was 0.3% higher. The impact of the intervention measures taken to mitigate the impact of high energy prices on the price of electricity supply for the average household consumer is shown in Figure 9.

FIGURE 9: IMPACT OF THE INTERVENTION MEASURES TAKEN TO MITIGATE THE EFFECTS OF HIGH ENERGY PRICES ON THE PRICE OF ELECTRICITY SUPPLY FOR THE AVERAGE HOUSEHOLD CONSUMER



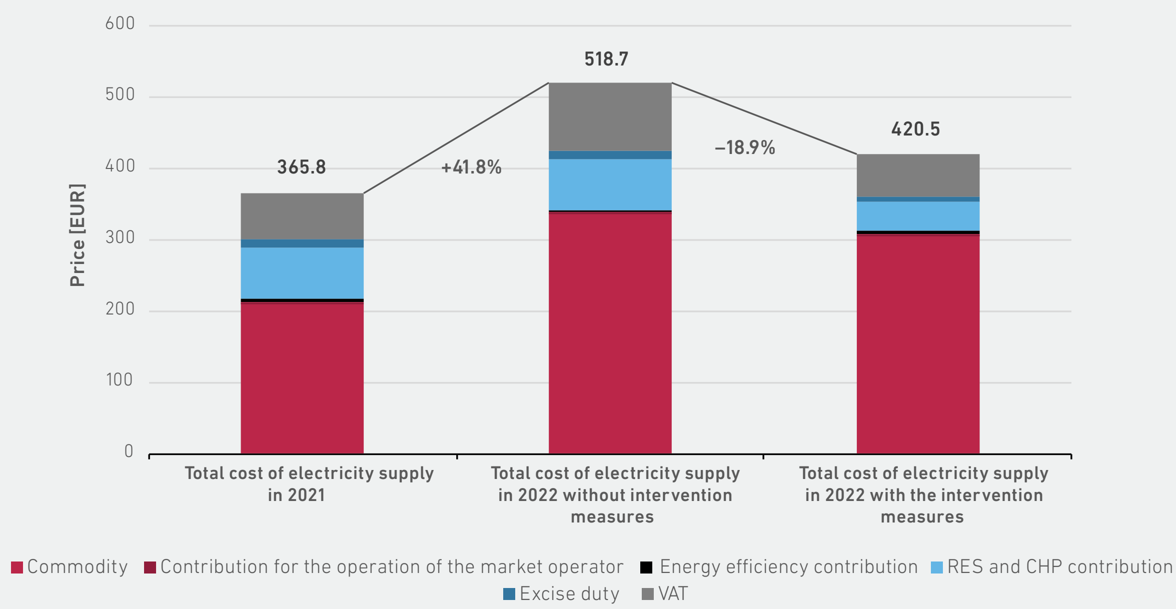
SOURCE: ENERGY AGENCY

23 Decree Amending the Decree on the Environmental Tax on Air Pollution Caused by Carbon Dioxide Emissions (Official Gazette of the Republic of Slovenia, No 118/22)

24 Consumption profile of the average household electricity consumer in Slovenia: billing power 8 kW, 1,996 kWh (VT) and 2,100 kWh (MT)/year

If the calculation does not take into account the network charge and the intervention measure of the exemption from paying network charges, which was in force from 1 February to 30 April 2022 and was not included in the list of recommended measures of the EC, the State's intervention measures have, according to the Energy Agency's calculations, alleviated the pressure of high prices on the annual cost of electricity supply for the average household consumer by EUR 98.2. Without the intervention measures, the annual cost of electricity supply for the average household customer (excluding the network charge) would have been EUR 518.7, while with the intervention measures, it would have been EUR 420.5. This represents an 18.9% reduction in the annual cost of electricity supply compared to the calculation without the intervention measures, which do not include the network charge intervention. In 2021, the annual cost of supplying electricity to an average household consumer without the network charge was EUR 365.8. Without the intervention measures, the annual cost of supplying electricity without the network charge would have been 41.8% higher in 2022, while after the intervention measures, the annual cost of supplying electricity without the network charge was 15% higher in 2022. The impact of the intervention measures adopted to mitigate the impact of high energy prices on the cost of electricity supply for the average household consumer is shown in Figure 10.

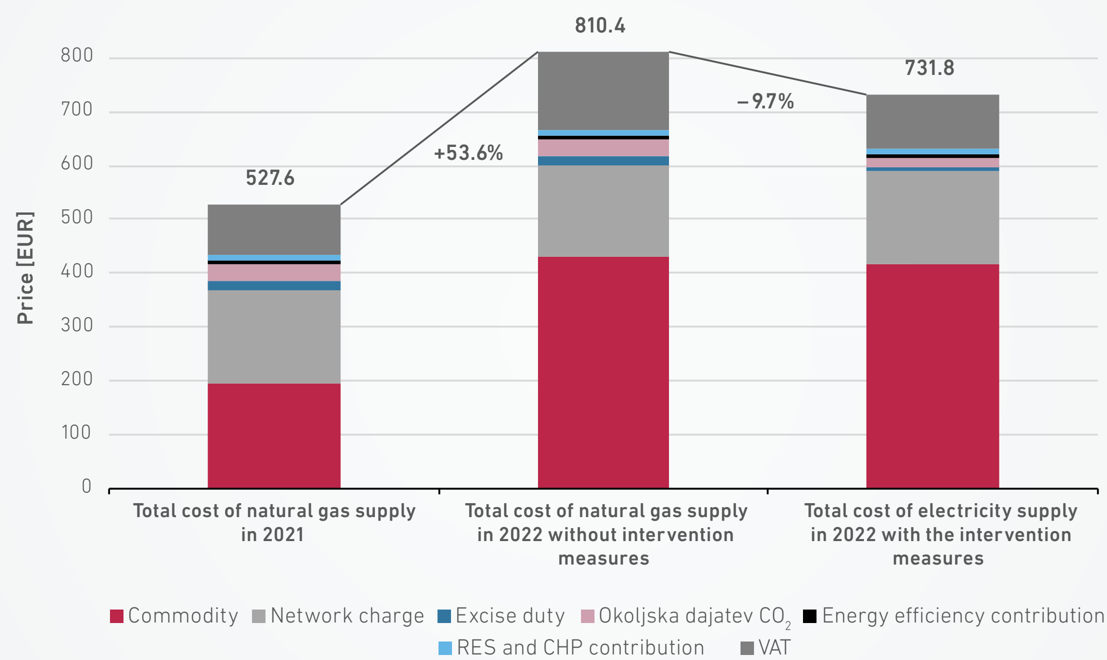
FIGURE 10: IMPACT OF THE INTERVENTION MEASURES TAKEN TO MITIGATE THE EFFECTS OF THE HIGH ENERGY PRICES ON THE PRICE OF ELECTRICITY SUPPLY FOR THE AVERAGE HOUSEHOLD CONSUMER, WITHOUT THE NETWORK CHARGE



SOURCE: ENERGY AGENCY

According to the Energy Agency's calculations, these intervention measures alleviated the pressure of the high prices on the annual cost of natural gas supply for the average household consumer[25] by EUR 78.6. Without the intervention measures, the price of natural gas supply for the average household consumer would have been EUR 810.4, while with the intervention measures, it was EUR 731.8, which represents a 9.7% reduction in the annual cost of natural gas supply compared to the calculation without the intervention measures. In 2021, the annual cost of supplying natural gas to an average household consumer amounted to EUR 527.6. Without the intervention measures, the annual cost of supplying natural gas in 2022 would have been 53.6% higher, while after the intervention measures, the annual cost of supplying natural gas in 2022 was 38.7% higher. The impact of the intervention measures adopted to mitigate the impact of high energy prices on the price of natural gas supply for the average household consumer is shown in Figure 11.

FIGURE 11: IMPACT OF THE INTERVENTION MEASURES TAKEN TO MITIGATE THE EFFECTS OF THE HIGH ENERGY PRICES ON THE PRICE OF NATURAL GAS SUPPLY TO THE AVERAGE HOUSEHOLD CONSUMER



SOURCE: ENERGY AGENCY

25 Consumption profile of the average household natural gas consumer in Slovenia: 9508 kWh/year

In calculating the effects of the intervention measures adopted to mitigate the effects of high energy prices, the Energy Agency took into account the cheapest offer on the retail market in each month in 2021 and 2022, which was available to all household consumers and allowed the customer to switch supplier at any time without a contractual penalty. The Energy Agency also calculates retail price indices (RPI)[26] on the basis of these offers. In the months when the retail price was at the level of the permitted retail price, the total cost of energy supply in 2022, without taking into account the intervention measures, used the average indicative prices of the suppliers indicated in the price lists together with the permitted highest retail price and would have been applicable in the absence of the regulation prescribing the highest retail price[27]. The consumption by month was evenly distributed. The network charge of the Maribor distribution system was considered in calculating the annual cost of natural gas supply to the average household consumer. The measures taken and the changes in retail prices were also taken into account on a rolling basis by month.

To mitigate the impact of the rising energy prices, the State has also come to the aid of the economy with a set of temporary measures:

September 2022 – Act Governing Aid to Businesses Hit by High Increases in Electricity and Natural Gas Prices (ZPGVCEP)[28]

Subsidy support for small, medium and large enterprises in the second half of 2022 (the amount of the subsidy for each enterprise depended on the price of energy products in 2021 and 2022), measures to improve the liquidity of enterprises for investment and working capital. The law was amended at the end of the year.

The 2023 network charge tariffs did not increase despite a 42.5% increase in the planned costs of the electricity operators – with the State intervention measure, another source was found to cover the costs

September 2022 – Act on the Guarantee of the Republic of Slovenia for the Obligations from Credits Taken Out to Ensure Liquidity on the Organized Electricity Markets and Emission Coupons and Obligations from the Purchase Additional Quantities of Natural Gas from Outside the European Union Market (ZPKEEKP)[29]

This law ensured that energy companies (GEN Energija, HSE and its subsidiaries, and Geoplin) had reliable access to short-term liquid working capital that they might need to cover short-term liquidity stresses.

December 2022 – Act Regulating the Emergency Intervention to Address High Energy Prices (ZNPOVCE)[30]

Temporary measures were taken to reduce import dependency in energy supply, increase renewable energy production, energy price control measures (district heating prices) and energy products (subsidies for the purchase of wood pellets), contributions from surplus revenues of electricity producers and other measures to intervene in high energy prices. To monitor the measure to reduce import dependency, the electricity transmission system operator identified and monitored the actual electricity consumption of the final consumer in peak hours, which was 6% lower than the required monitoring period of the last five years and 1% higher than required by Council Regulation (EU) 2022/1854 on emergency intervention to address the high energy prices.

26 In the 2021–2022 period, there is no significant spread between the RPI and the so-called regular list prices, so the use of the RPI is a good enough basis for the analysis based on costs at the level of a single calendar month (e.g. the average annual RPI is 11% lower than the average electricity price according to the STAT methodology for 2022). The RPI is defined in more detail in the Retail Price Index for Typical Household Consumer section.

27 The average indicative price for each month was determined as the unweighted average of all the available indicative prices from suppliers (isolates were excluded). Thus, five such prices were taken into account for calculating the indicative price for electricity, and two such available prices were taken into account for determining the indicative price for natural gas.

28 Act Governing Aid to Businesses Hit by High Increases in Electricity and Natural Gas Prices (Official Gazette of the Republic of Slovenia, Nos 117/22 in 133/22)

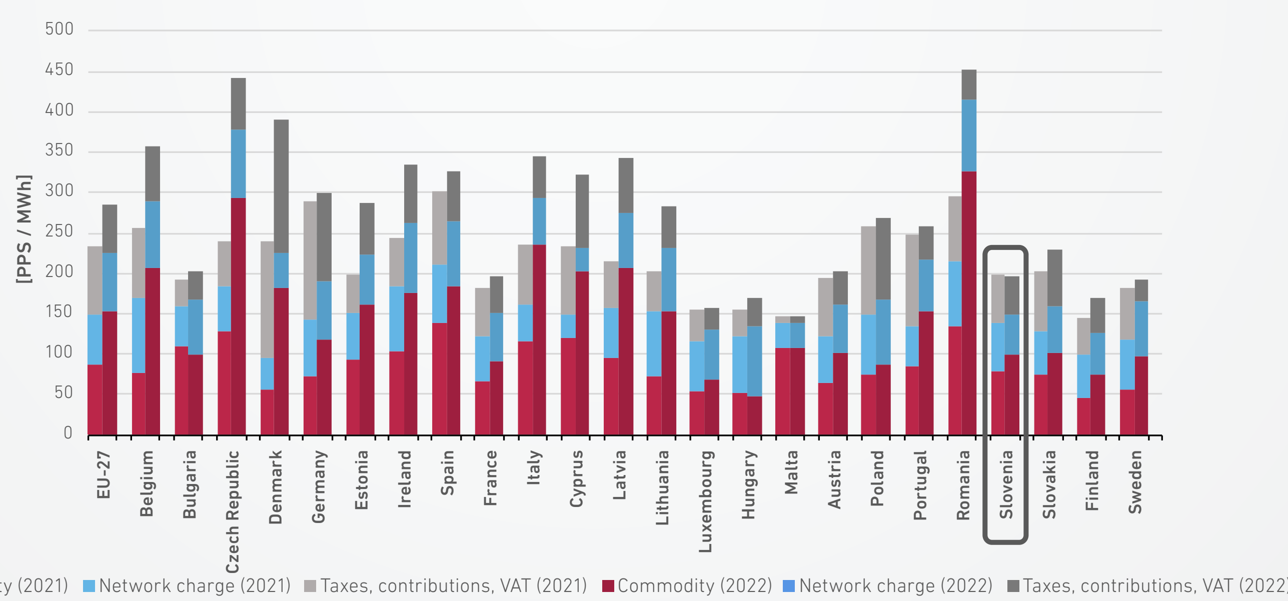
29 Act on the Guarantee of the Republic of Slovenia for the Obligations from Credits Taken Out to Ensure Liquidity on the Organized Electricity Markets and Emission Coupons and Obligations from the Purchase Additional Quantities of Natural Gas from Outside the European Union Market (Official Gazette of the Republic of Slovenia, No 121/22)

30 Act Regulating the Emergency Intervention to Address High Energy Prices (Official Gazette of the Republic of Slovenia, Nos 158/22 in 49/23)

One of the eligible costs for electricity operators is the cost of purchasing electricity for losses in the system. The extremely high electricity prices for losses have also had an impact on the projected eligible costs of the two electricity operators, which were 42.5% higher in total in 2023 compared to 2022. Consequently, the 2023 transmission system network charge should increase by 109.7% compared to 2022, while the distribution system network charge should increase by 4%. The State stipulated in the ZNPOVCE that the 2023 network tariff rates would remain unchanged compared to 2022 and that the surplus congestion revenues of 2022 and 2023 will be used to cover eligible costs on the transmission and distribution system. The ZNPOVCE stipulates that if the surplus congestion revenues of 2022 and 2023 are insufficient to cover all the planned eligible costs, surplus market revenues or other appropriate resources may also be used for these purposes. With the above measures, the State has ensured that the network charge for all final consumers remains unchanged in 2023 and, according to the Energy Agency's calculations, the pressure of the high prices on the annual cost of electricity supply for the average household consumer[31] has been alleviated by an additional EUR 76.6.

At different times of the year, EU Member States have taken measures to mitigate the effects of the rising energy prices. Figure 12 shows the effects of a group of measures to mitigate the effects of rising electricity prices and it can be seen that not all countries have been able to significantly reduce the impact of the rising electricity prices on the final cost of supply for a typical household consumer. This impacted the consumers' economic situation, as measured by the purchasing power standar[32]. This indicator allows the assessment that the measures to mitigate the effects of electricity price increases on the household segment in Slovenia have had an impact, and thus a positive impact on the economic situation of households.

FIGURE 12: OVERVIEW OF THE COMPONENTS OF THE TOTAL ELECTRICITY SUPPLY PRICE BY PURCHASING POWER STANDARD FOR A TYPICAL DC HOUSEHOLD CONSUMER BETWEEN 2021 AND 2022



SOURCES: ENERGY AGENCY, EUROSTAT

31 Consumption profile of the average household electricity consumer in Slovenia: billing power 8 kW, 1,996 kWh (VT) and 2,100 kWh (MT)/year

32 Purchasing power standard (PPS) is an artificial, fictitious currency. It is equal to one euro at the level of the EU average. In theory, one PPS can buy the same amount of goods and services in each country. Cross-border price differences mean that the same goods and services require different quantities of units in the national currency. The PPS is calculated by dividing any country's economic aggregate in national currency into its purchasing power parities. Purchasing power parities are exchange rates that equalise the purchasing power of different currencies by eliminating differences in price levels between countries.

Uninterruptible Natural Gas Supply for Specific Categories of Consumers

The energy crisis also indicated certain shortcomings in the system legislation, as in the field of natural gas supply, the right of consumers to uninterrupted supply was not regulated in cases where they are left without supply for reasons on the supplier's side.

Developments in the wholesale markets also affected the business of suppliers, as some of them exited the market or stopped supplying natural gas. In a number of cases, consumers whose supply contracts have expired have not been able to obtain offers on the market for the supply of natural gas, even though they have applied to several suppliers. In **September 2022**, the **Act Amending the Gas Supply Act**[33] was therefore adopted, introducing substitute and basic gas supply, to which household consumers, small business consumers, joint household consumers and protected consumers connected to the distribution system are entitled if they are suddenly left without a supplier or a gas supply offer.

To ensure the equal treatment of all households, the definition of household gas customers has been amended to clarify that household customers use household gas at their point of consumption up to a maximum of the estimated annual gas consumption per 100,000 kWh, similar to the situation for a small business customer. The household customer's estimated annual gas consumption of 100,000 kWh is assimilated to the annual consumption of the small business customer, thus treating them similarly in terms of choice and switching supplier, as well as in terms of special rights for the protection of gas customers.

33 Act Amending the Gas Supply Act (Official Gazette of the Republic of Slovenia, No 121/22)

ELECTRICITY

RES **5.8** PERCENTAGE POINTS LOWER THAN IN 2021

ELECTRICITY GENERATED AND DELIVERED INTO THE SYSTEM:
- 43.5% NUCLEAR FUEL
- 330.9% RENEWABLE
- 25.5% FOSSIL FUELS

ESTIMATED **23%** SHARE OF RES IN TOTAL GROSS FINAL ENERGY CONSUMPTION - 2.4 PERCENTAGE POINTS BELOW THE 2022 TARGET

70% COVERAGE

ELECTRICITY CONSUMPTION BY DOMESTIC PRODUCTION - 12,9 PERCENTAGE POINTS LESS THAN IN 2021

7.8% OF ELECTRICITY FROM GENERATION INSTALLATIONS IN THE SUPPORT SCHEME

53.4% SHARE OF UNDERGROUND LINES IN THE DISTRIBUTION SYSTEM

ELECTRICITY LOSSES ON THE TRANSMISSION SYSTEM THE HIGHEST IN THE LAST TEN YEARS AS A RESULT OF:

- INCREASED TRANSIT THROUGH THE SLOVENIAN TRANSMISSION SYSTEM
- LOWER GENERATION FROM DOMESTIC SOURCES
- HIGHER IMPORTS OF EE

91.9% OF CUSTOMERS ON THE DISTRIBUTION SYSTEM EQUIPPED WITH ADVANCED METERING SYSTEMS

The cornerstone of modern lifestyles technological development and achieving climate neutrality

TOTAL **INVESTMENT IN SMART GRIDS €38.1 MILLION** – STILL SIGNIFICANTLY UNDERINVESTED IN DISTRIBUTION, ONLY €0.78 MILLION

42.8% INCREASE IN THE TOTAL NUMBER OF ELECTRIC VEHICLES IN THE TOTAL NUMBER OF PASSENGER CARS AND LIGHT COMMERCIAL VEHICLES

49% MORE ELECTRICITY GENERATED FROM SOLAR POWER PLANTS THAN IN 2021

2.9% OF ALL CONSUMERS ON THE DISTRIBUTION SYSTEM AT THE SAME TIME AS A PRODUCER

6 SUPPLIERS EXITED FROM THE RETAIL MARKET

25,743
HOUSEHOLD CONSUMERS ON THE SELF-SUPPLY SYSTEM – MORE THAN 11,500 NEWLY CONNECTED LAST YEAR – 25% OF CONNECTION APPLICATIONS REJECTED

5 ACTIVE AGGREGATORS ON THE SLOVENIAN MARKET

27 NEW SELF-SUPPLY COMMUNITIES

CONTINUATION OF **RECORD ENERGY PRICE GROWTH** ON WHOLESALE MARKETS

FINAL PRICE OF ELECTRICITY SUPPLY FOR A TYPICAL HOUSEHOLD AND BUSINESS CONSUMER BELOW THE EU AVERAGE

MORE THAN **80%** INCREASE IN FINAL SUPPLY PRICES FOR THE AVERAGE BUSINESS CONSUMER

0.5%
DECREASE IN THE AVERAGE ANNUAL FINAL SUPPLY PRICE FOR A TYPICAL HOUSEHOLD CONSUMER

- 27.8 HIGHER AMOUNT FOR ENERGY
- 16,4 % LOWER NETWORK CHARGE DUE TO THE THREE-MONTH SUSPENSION OF THE PAYMENT
- VAT, EXCISE DUTY AND RES AND CHP CONTRIBUTION ALSO LOWER

3.9% LOWER CONSUMPTION OF ALL END CONSUMERS

4.7% LOWER CONSUMPTION BY HOUSEHOLD CONSUMERS
CONSUMPTION IN THE INDOOR INSTALLATION OF CONSUMERS IS NOT TAKEN INTO ACCOUNT

3,5 % REDUCTION IN CONSUMPTION OF COMMERCIAL CONSUMERS

42.5% HIGHER COSTS FOR ELECTRICITY OPERATORS FOR 2023 - TARIFFS FOR CONSUMERS FOR 2023 REMAINED UNCHANGED

ELECTRICITY

Electricity Balance

Inputs and Outputs of Electricity in the System

In 2022, 12,192 GWh of electricity were delivered into the electricity system from generation units connected to the transmission or distribution system, which was 2231 GWh less than in 2021. The electricity balance of the inputs and outputs shown in Figure 13 also includes the withdrawal of 32 GWh from battery storage in the context of generation in the distribution system and within closed distribution systems. The delivery from facilities using RES amounted to 3762 GWh, which is 1530 GWh less than the year before, while facilities using fossil fuels contributed 3128 GWh or 592 GWh less than in 2021. The Krško Nuclear Power Plant (NPP) delivered 5302 GWh of electricity or 109 GWh less than the year before. These quantities are taken from the balance sheets of the electricity system operators and are based on physical flows.

12,192 GWh of electricity delivered into the electricity system, 30.9% of which was generated in production facilities using RES

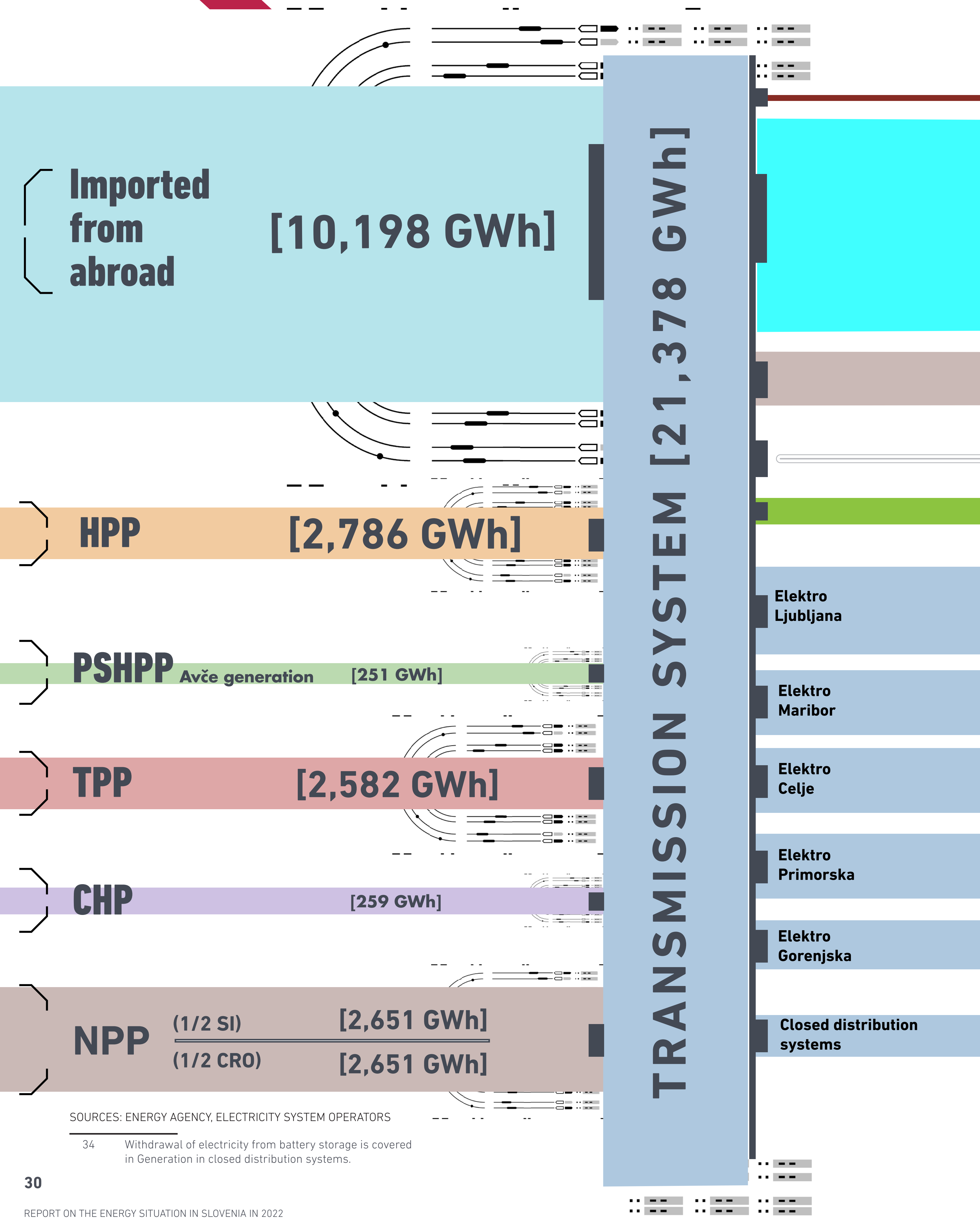
The quantity of electricity delivered into the electricity system produced by facilities connected to the distribution system, which includes closed distribution systems (CDS), decreased by 99 GWh to a total of 980 GWh, or 1,012 GWh including the electricity drawn from battery storage. In internal consumers' networks with connected production facilities according to connection scheme PS.2, an additional 445 GWh of electricity was consumed, which represents 44% of all electricity generated in facilities connected to the distribution system and closed distribution systems. The estimated production from self-supply devices amounted to 288 GWh, of which, considering the annual calculation, 248 GWh of electricity was consumed by final consumers as self-supply.

TABLE 1: ELECTRICITY INPUTS INTO THE TRANSMISSION AND DISTRIBUTION SYSTEMS IN THE 2020–2022 PERIOD, IN GWh

Electricity input to the transmission system [GWh]	**2020**	**2021**	**2022**
Dravske elektrarne Maribor	3,182.3	2,888.3	1,846.9
Savske elektrarne Ljubljana	327.4	339.8	225.7
Hidroelektrarne na spodnji Savi	524.6	549.8	400.0
Soške elektrarne Nova Gorica	423.1	442.5	313.0
Avče PSHPP in the generation regime	289.4	283.3	251.2
Total Hydro	**4,746.8**	**4,503.7**	**3,036.7**
Šoštanj TPP	3,581.6	3,112.0	2,541.8
Brestanica TPP	47.6	46.1	40.8
Trbovlje TPP	–1.7	–1.6	0.1
Javno podjetje Energetika Ljubljana	244.7	272.4	258.8
Total TPP and CHP	**3,872.2**	**3,429.0**	**2,841.4**
Krško Nuclear Power Plant	**6,040.1**	**5,411.3**	**5,302.2**
Total electricity input into the transmission system	**14,659.0**	**13,344.1**	**11,180.4**
Electricity input into the distribution system [GWh]	**2020**	**2021**	**2022**
HPP up to and including 1 MW	199.3	211.3	158.7
HPP above 1 MW	159.5	165.6	114.1
Woody biomass-fuelled facilities	57.6	59.6	41.5
Wind farms	6.2	5.5	5.7
Solar power plants	250.2	252.6	286.8
Facilities using biogas	89.6	92.6	117.1
Waste-to-energy plants	4.5	0.9	0.7
Total RES	**766.9**	**788.2**	**724.6**
Total conventional sources	**321.9**	**291.0**	**255.5**
Unidentifiable (withdrawal from storage facilities)	**0.0**	**20.6**	**31.8**
Total electricity input into the distribution system	**1,088.7**	**1,099.8**	**1,011.9**
TOTAL ELECTRICITY INPUT	**15,747.7**	**14,443.9**	**12,192.3**

SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

FIGURE 13: BALANCE OF ELECTRICITY INPUTS AND OUTPUTS IN THE TRANSMISSION AND DISTRIBUTION SYSTEM IN 2022[34]



SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

34 Withdrawal of electricity from battery storage is covered in Generation in closed distribution systems.

Consumers connected directly to the transmission system [96 GWh]

Exported abroad [6,101 GWh]

NPP (1/2 CRO) export: [2,651 GWh]

Transmission system losses [364 GWh]

Avče PSHPP—consumption [341 GWh]

[4,246 GWh]

[2,046 GWh]

[1,822 GWh]

[1,511 GWh]

[1,071 GWh]

[1,129 GWh]

Generation in the distribution system [917 GWh]

Generation in closed distribution systems [95 GWh]

DISTRIBUTION SYSTEM [12.915 GWH]

Business consumption (110 kV) [467 GWh]

Business consumption (1-35 kV) [5,235 GWh]

Business consumption (0,4 kV) [3,160 GWh]

Household consumption [3,493 GWh]

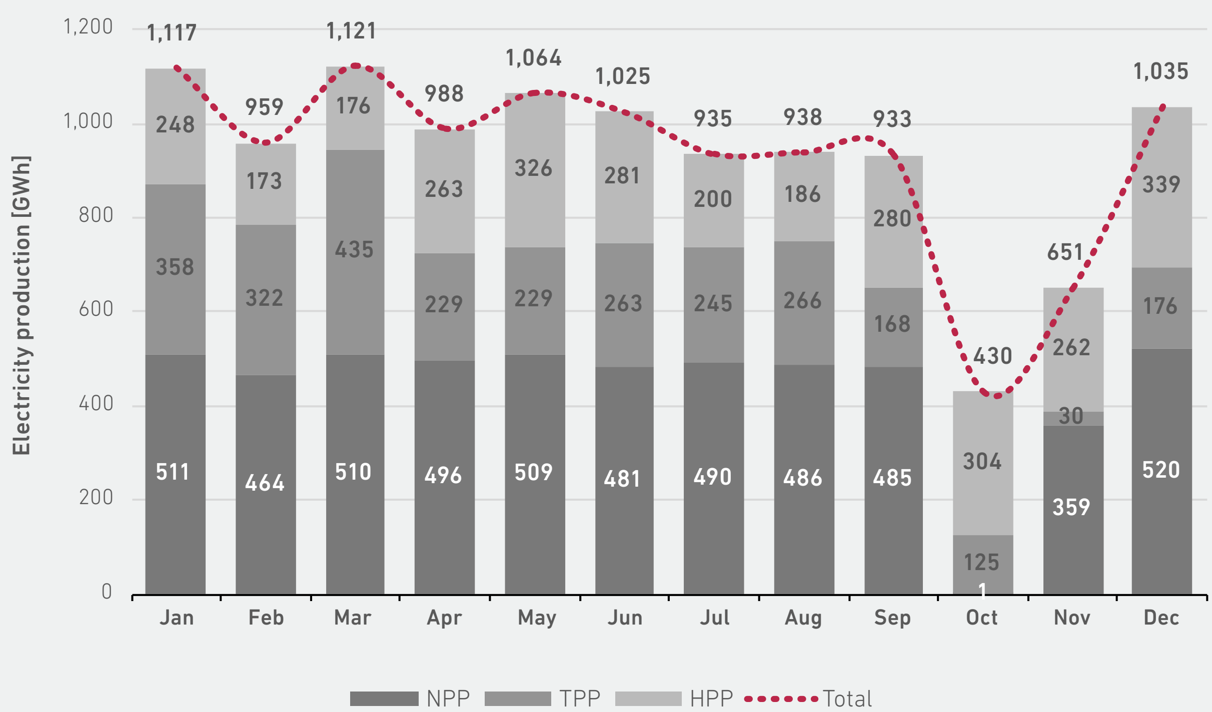
Distribution system losses [456 GWh]

Losses in closed distribution systems [26 GWh]

Domestic production sources – which include half of the production from the Krško NPP – contributed 9,541 GWh of electricity to the Slovenian electricity system. The demand from final consumers, including system losses, amounted to 13,637 GWh. In 2022, 70% of electricity consumption by final consumers in Slovenia was covered using domestic production sources.

Figure 14 shows the monthly movement of electricity production in large power plants that were connected to the transmission system in 2022. Poor hydrological conditions marked the entire year, which affected the quantity of electricity generated by the hydropower plants. In October, the Krško NPP underwent its regular overhaul. During this period, the decision was made to start saving coal for the presumed increase in demand in the winter months, due to the limited extraction of coal in the Velenje Coal Mine. Consequently, the night from 14 to 15 October saw the shut-down of TEŠ 6, which means that electricity production using coal stopped completely. The unit was shutdown until the morning of 5 December, when it was put back into operation. The resumed operation was possible mainly due to a drop in prices in neighbouring markets and the relatively favourable hydrology in the period from September to the end of the year, which enabled more production in the hydropower plants.

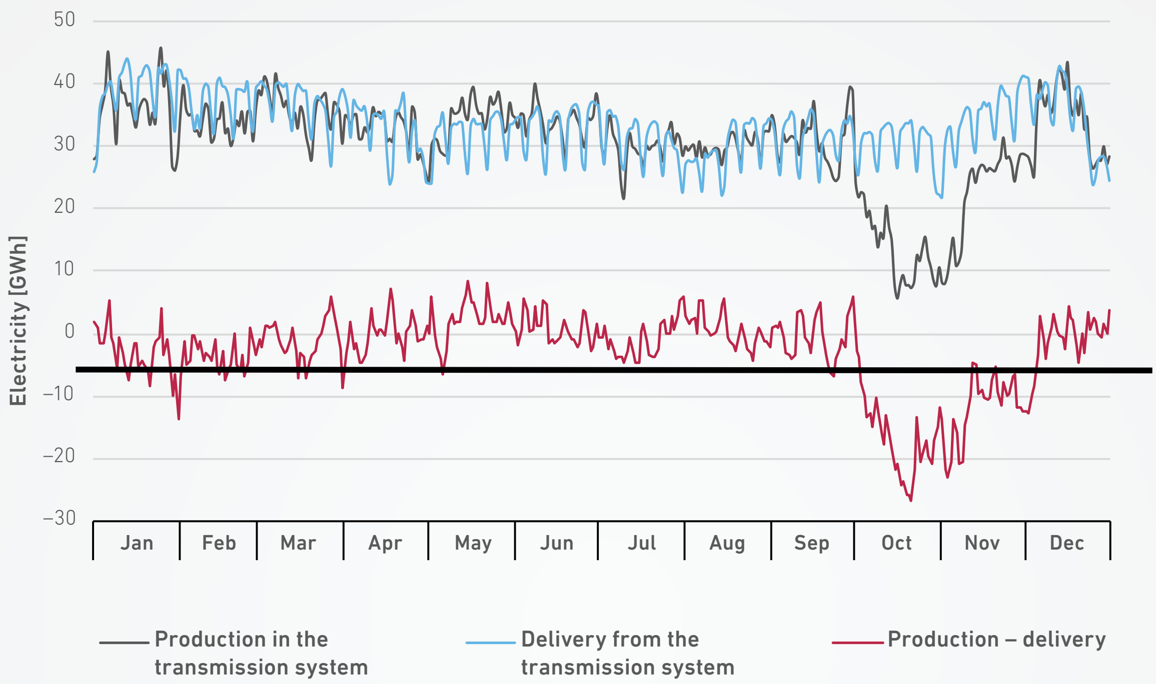
FIGURE 14: MONTHLY VARIATION OF ELECTRICITY PRODUCTION IN LARGE POWER PLANTS CONNECTED TO THE TRANSMISSION SYSTEM



SOURCES: ENERGY AGENCY, ELES

Figure 15 shows the variation in electricity production and delivery from the transmission system, where it is possible to observe a drastic drop in production in October and November. Consequently, Slovenia's import dependency increased significantly in this period. In other months, the domestic production on average kept up with domestic needs.

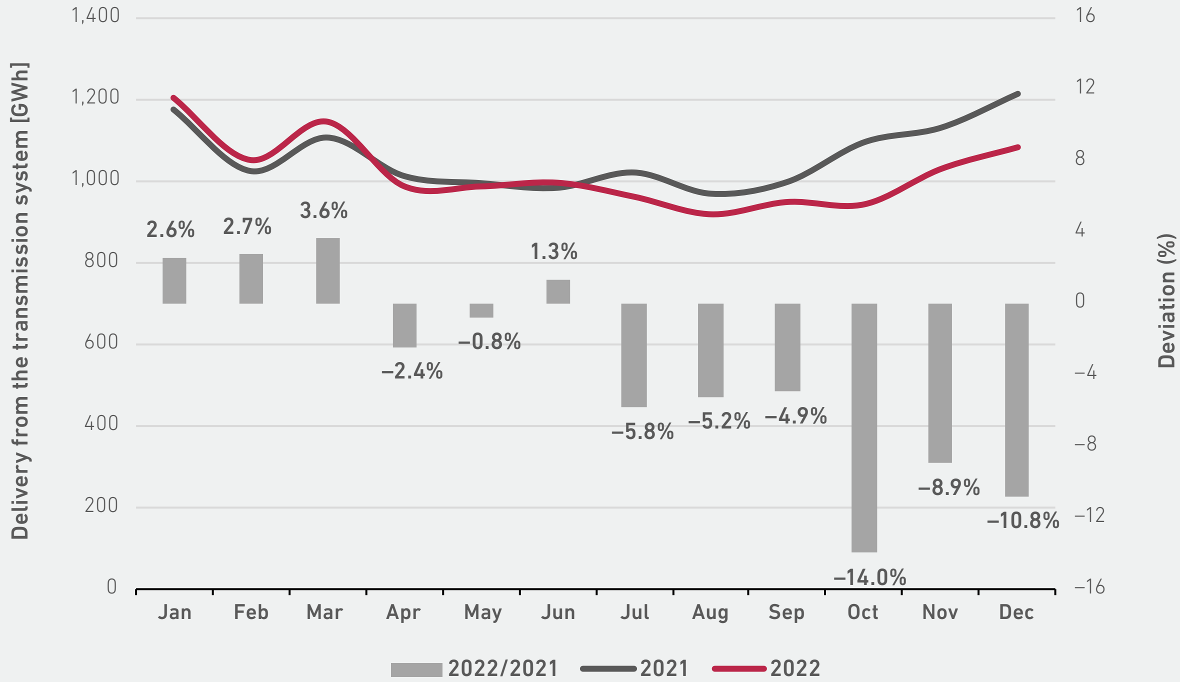
FIGURE 15: DAILY VARIATION OF ELECTRICITY PRODUCTION AND INPUT INTO THE TRANSMISSION SYSTEM



SOURCES: ENERGY AGENCY, ELES

Figure 16 shows the monthly variation in the delivery of electricity from the transmission system in 2021 and 2022. Shown separately is the monthly margin of delivery during both years, which clearly shows the impact of the price increase in the second half of 2022, contributing to lower consumption. Another factor in the reduced consumption was Council Regulation (EU) 2022/1854 of 6 October 2022 on an emergency intervention to address high energy prices, which required the gross electricity consumption to be reduced by 10%.

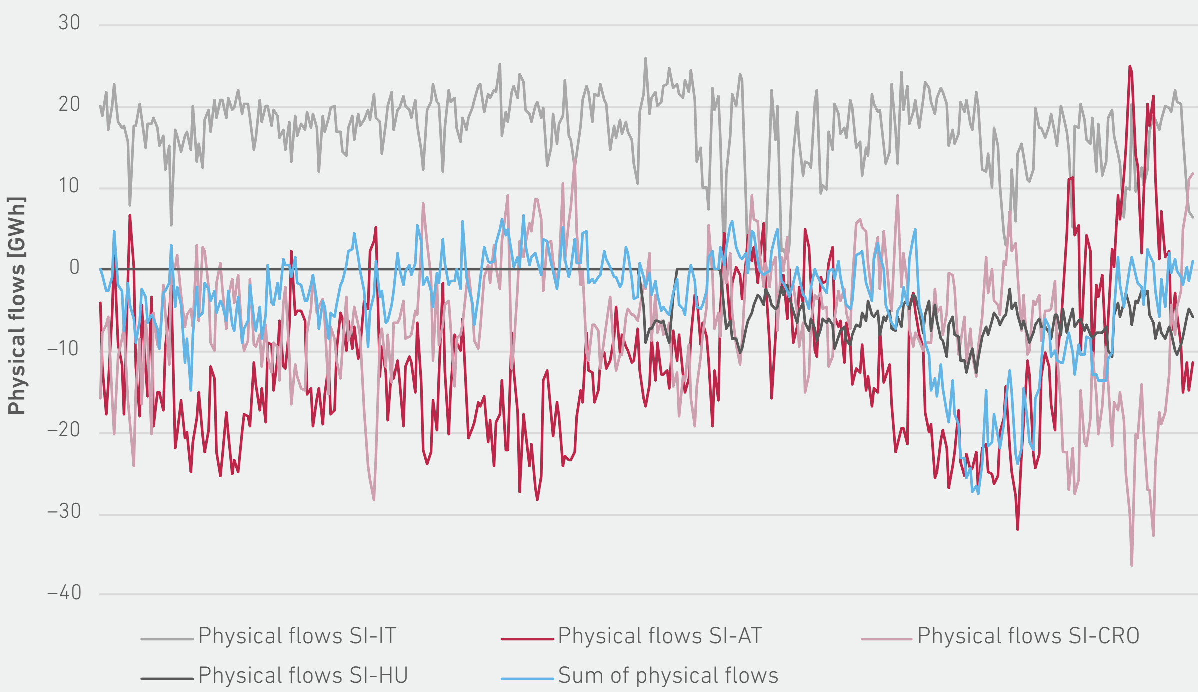
FIGURE 16: MONTHLY DELIVERY OF ELECTRICITY FROM THE TRANSMISSION SYSTEM IN 2021 AND 2022, ALSO SHOWING MONTHLY DEVIATIONS



SOURCES: ENERGY AGENCY, ELES

The Slovenian electricity transmission system is connected to the transmission systems of neighbouring countries on the borders with Italy, Croatia and Austria, and also with Hungary since 30 June 2022, when the 400-kV Cirkovce–Pince transmission line was put into operation. 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 deficit or the export of surplus electricity from the transmission system. Figure 17 shows the sum of the physical electricity flows at all four borders (SI-IT, SI-HR, SI-AT and SI-HU) in addition to the movement of individual physical flows.

FIGURE 17: PHYSICAL ELECTRICITY FLOWS AT THE BORDERS WITH NEIGHBOURING COUNTRIES AND THE NET SUM OF THE PHYSICAL FLOWS

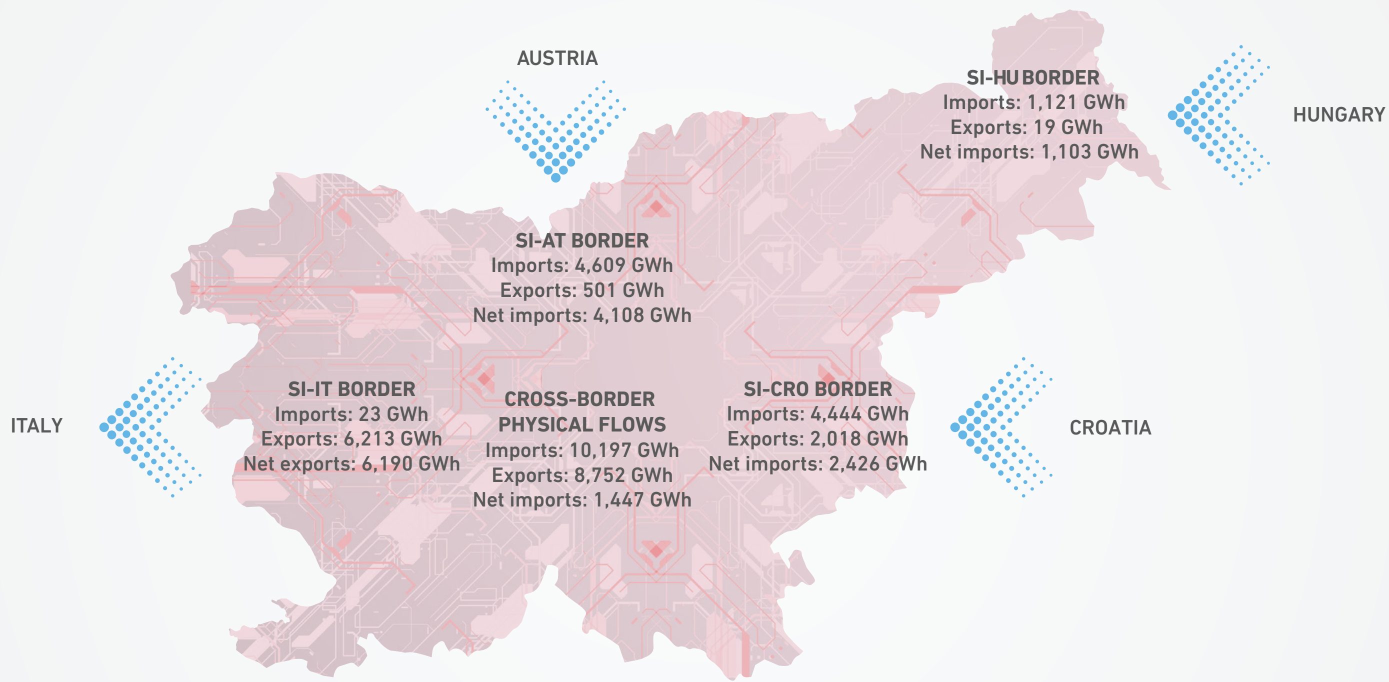


SOURCES: ENERGY AGENCY, ELES

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 2022, Slovenia was a net exporter of electricity to Italy and a net importer of electricity at the other three borders. Slovenia was a net importer of electricity in 2022 in terms of the total exchanges of electricity at the borders with neighbouring countries, even when electricity production by the Krško NPP is taken into account. Figure 18 shows the annual volumes of physical flows at the borders with neighbouring countries.

In 2022, Slovenia was a net electricity importer

FIGURE 18: PHYSICAL ELECTRICITY FLOWS ACROSS THE BORDERS WITH NEIGHBOURING COUNTRIES

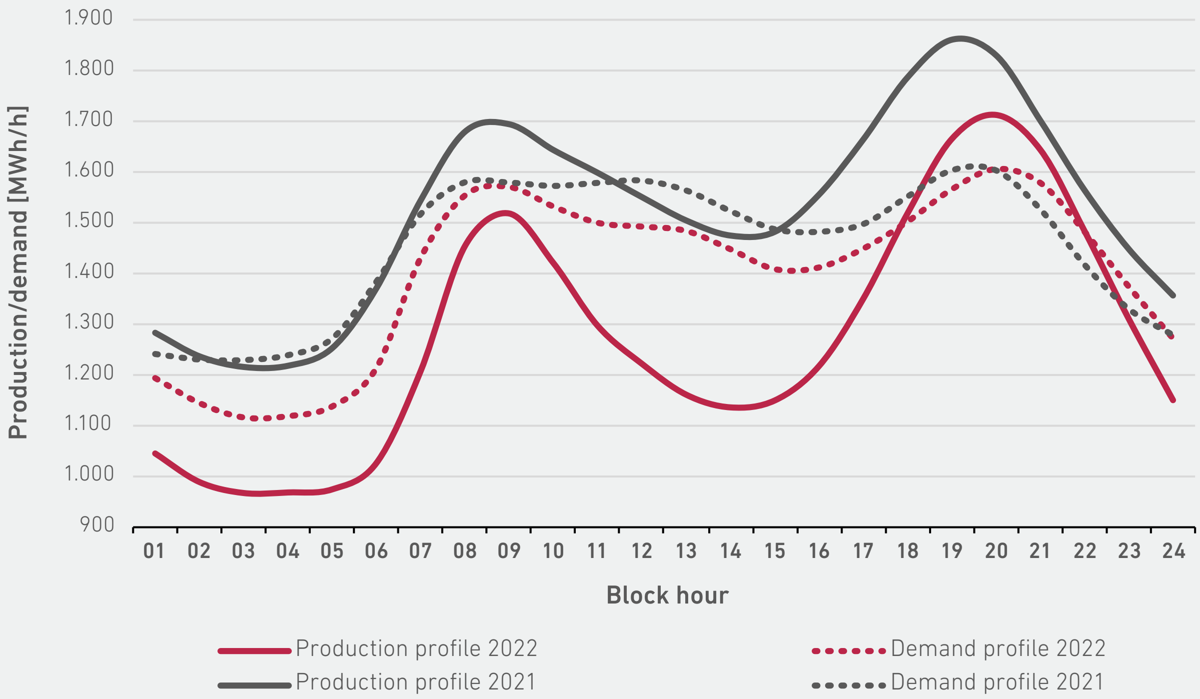


SOURCES: ENERGY AGENCY, ELES

Figure 19 shows the average daily profile of electricity generation and delivery in the transmission system in the years 2021 and 2022. In 2022, the transmission system saw the lowest load at night (between 02:00 and 03:00). There were two peaks, the first in the morning (between 08:00 and 12:00) and the second in the evening between 18:00 and 21:00. From the comparison of the profiles of generation and delivery in both years, it can be seen that for most of 2021, the production was higher on average than the delivery during the majority of hours, while in 2022 this was only true for five hours in the evening (between 18:00 and 22:00). Obviously, the main causes for this are the TEŠ 6 shut-down, which lasted for nearly two months, the Krško NPP overhaul, and the poor hydrological conditions in the first two-thirds of the year. Furthermore, it must also be taken into account that during the periods of lower electricity prices between 1:00 and 6:00, and 12:00 and 15:00, the hydropower plants are filling accumulation basins, while at the same time, the Avče PSHPP usually operates in the pumping regime.

The difference between the hourly generation and the delivery averages in 2022 was the highest at 13:00, when the production deficit reached 321 MWh/h, while the greatest difference between the average delivery and generation in 2022 was 260 MWh/h in terms of production surplus, occurring at 19:00. The highest hourly load on the electric transmission system in 2022 was 2109 MW – 37 MW less than in 2021. It was reached on Thursday, 8 January 2022, in the 8. block hour (between 7:00 and 8:00). Given that the peak in the last 10 years occurred around noon and in the evening hours, this peak occurred at an unusual time.

FIGURE 19: THE AVERAGE DAILY PROFILE OF ELECTRICITY GENERATION AND DELIVERY FROM THE TRANSMISSION SYSTEM IN THE YEARS 2021 AND 2022

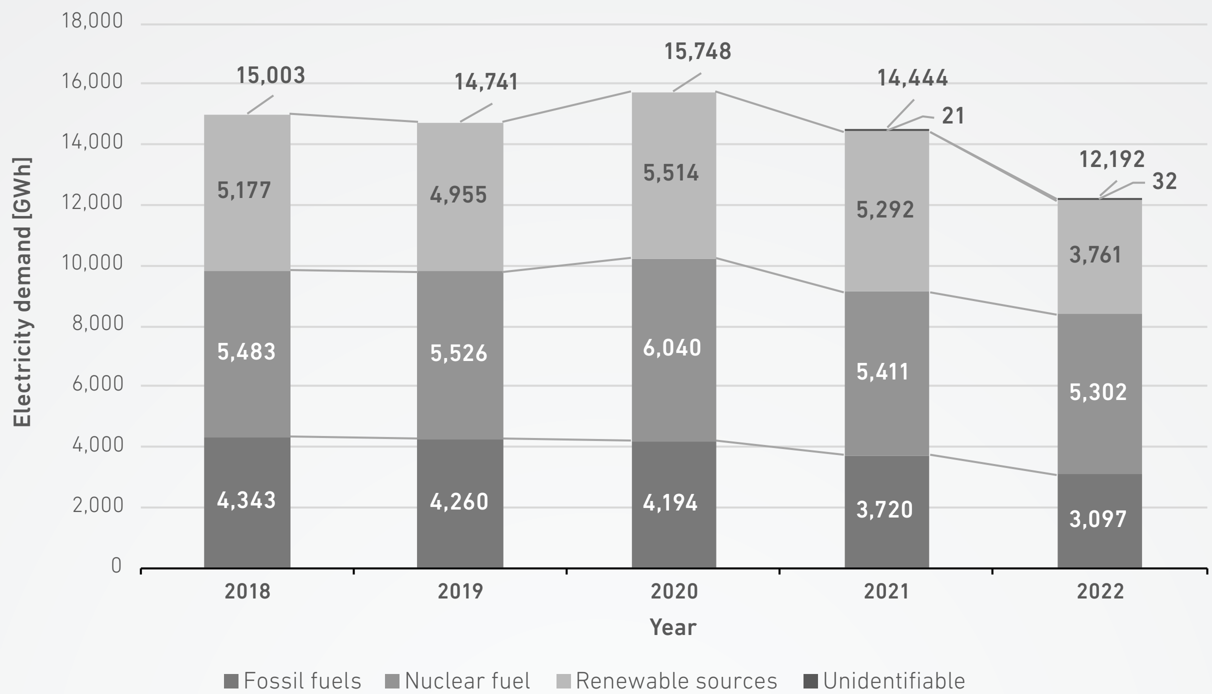


SOURCES: ENERGY AGENCY, ELES

The share of electricity generated in the hydropower plants and facilities using RES varies annually, depending on the hydrological and other conditions and investments in new generating facilities using RES. In 2022, this share was around 30.9% of all the electricity produced in Slovenia, which is 5.8 percentage points less than the previous year. Fossil-fuel power plants contributed 25.5% of the total generation, which is 0.3% less than in 2021, while the Krško NPP contributed 43.6% of all the electricity produced, which includes the 50% share belonging to Croatia in accordance with the intergovernmental agreement.

43.6% of all electricity produced and delivered was from the nuclear power plant, 30.9% from RES, and 25.5% from fossil fuels

FIGURE 20: ELECTRICITY DELIVERED FROM THE GENERATION FACILITIES TO THE TRANSMISSION AND DISTRIBUTION SYSTEMS IN THE 2018–2022 PERIOD



SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

TABLE 2: PRIMARY ENERGY SOURCES DELIVERED TO THE TRANSMISSION AND DISTRIBUTION SYSTEMS IN THE 2020–2022 PERIOD

Primary energy sources for electricity generation	2020		2021		2022	
	GWh	Share	GWh	Share	GWh	Share
Fossil fuels	4,194	26.6%	3,720	25.8%	3,097	25.5%
Nuclear fuel	6,040	38.4%	5,411	37.5%	5,302	43.6%
Renewable sources	5,514	35.0%	5,292	36.7%	3,761	30.9%
• Hydro	5,106	92.6%	4,881	92.2%	3,310	88.0%
• Wind	6.21	0.1%	5.54	0.1%	5.7	0.2%
• Solar	250	4.5%	253	4.8%	287	7.6%
• Biomass	152	2.8%	153	2.9%	159	4.2%
Unidentifiable			21	-	32	-
TOTAL ELECTRICITY INPUT	**15,748**		**14,444**		**12,192**	

SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

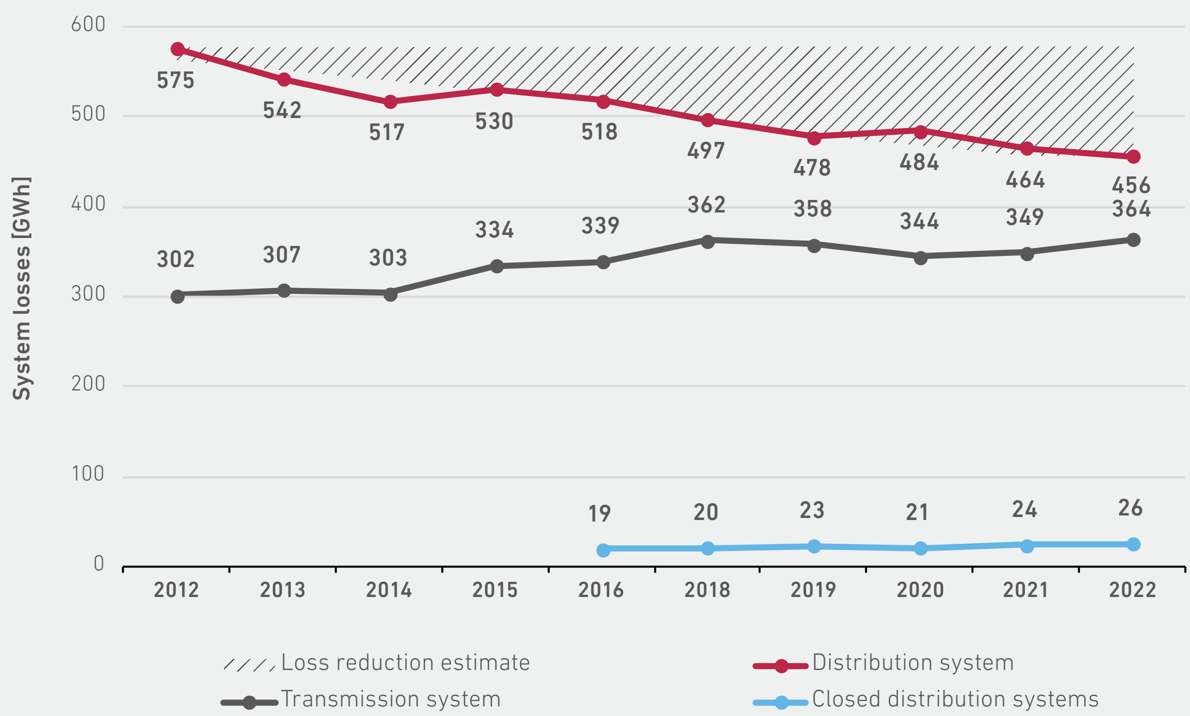
Losses in the Electricity System

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 transmission 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 at the final consumers.

Despite a slight increase in the percentage of electricity losses in the distribution system, the downward trend in the amount of losses is continuing due to various measures, especially the introduction of advanced metering systems, which allow better monitoring and control over commercial and technical losses, and the growing transition to medium- and low-voltage networks. In the 2012–2022 period, these measures led to an estimated 656 GWh of savings in electricity to cover distribution system losses.

The varying amount of electricity losses in the transmission system is significantly influenced by the inclusion of the Avče PSHPP after 2014 and the increased share of cross-border electricity trading in exports, imports and transit. The electricity losses in transmission, distribution and closed distribution systems along with an estimation of the savings in the 2012–2022 period are shown in Figure 21.

FIGURE 21: THE QUANTITIES OF ELECTRICITY LOSSES IN TRANSMISSION, DISTRIBUTION AND CLOSED DISTRIBUTION SYSTEMS IN THE 2012–2022 PERIOD AND AN ESTIMATE OF THE REDUCTION IN LOSSES



SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORSI

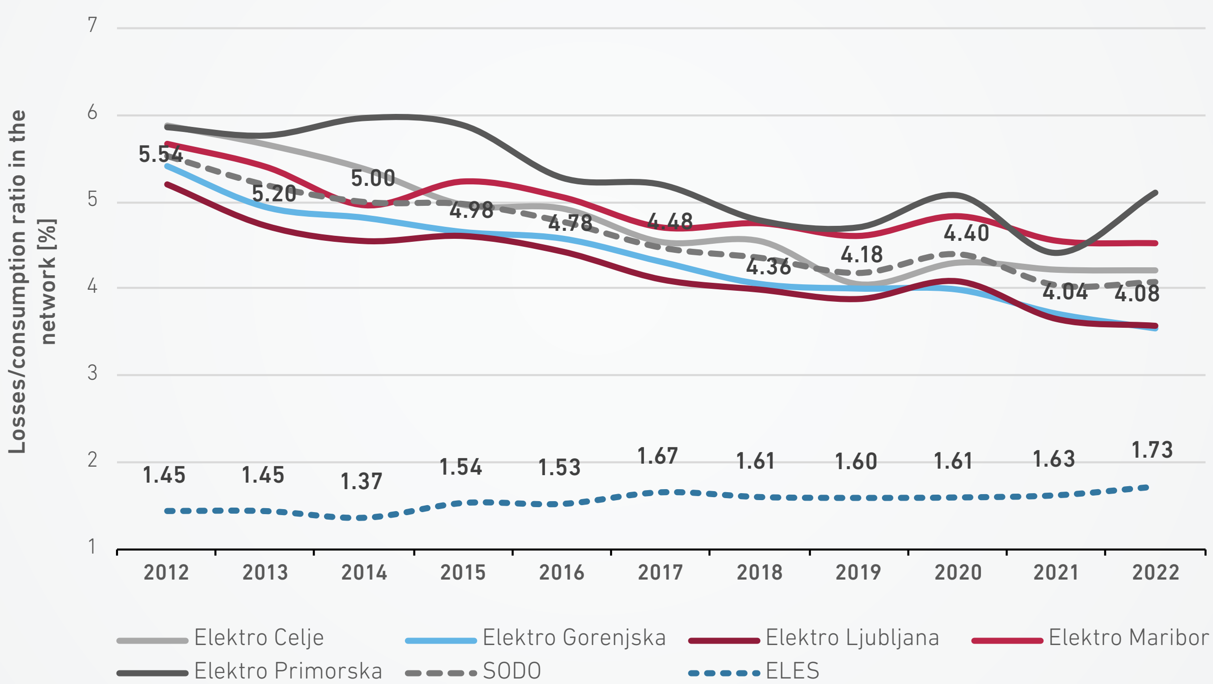
The task of effectively managing and reducing losses falls on ELES and SODO, who are also responsible for covering the electricity losses in the electricity system. As the electricity needed to cover losses needs to be provided in a transparent and market-efficient manner, both operators must strive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

The share of the losses is calculated based on the quantities consumed from the transmission or distribution system. 2022 saw a slight increase (0.04 percentage point) in the share of losses in the distribution system, though there is a long-term downward trend in the amount of electricity losses. In recent years, ELES has managed to maintain the share and amount of losses in the transmission system, where the amount of losses had been increasing for multiple years due to the increased transit of electricity across the country, while in 2022, the amount and share of the losses increased to the highest value in the last ten years. This is due to a combination of factors, including the increased transit in the Slovenian transmission system, lower domestic production, higher import of electricity, and to a lesser extent, the entry into service of the Cirkovce–Pince transmission line.

Electricity losses in the transmission system were the highest in the ten-year period

Figure 22 shows the shares of losses for ELES, SODO and the distribution companies in the 2012–2022 period.

FIGURE 22: SHARES OF LOSSES FOR ELES, SODO AND THE DISTRIBUTION COMPANIES IN THE 2012–2022 PERIOD



SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

Electricity Generation

In 2022, 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, representing the second energy pillar. The GEN group also owns 51% of the Hidroelektrarne na spodnji Savi company (HESS), while the remaining part of this company belongs to the HSE group.

The lowest generation of electricity in recent years, mainly due to poor hydrological conditions and the temporary shut-down of TEŠ 6

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

PRODUCER	Installed capacity [MW]	Share – installed capacity, all producers in Slovenia	Generation [GWh]	Share – generation, all producers in Slovenia
HSE, d.o.o.	**1,930.3**	**48.5%**	**5,147.9**	**50.5%**
Hydropower plants	937.6		2,607.0	
Thermal power plants	990.0		2,540.9	
GEN energija, d.o.o.	**1,041.0**	**26.1%**	**3,122.8**	**30.6%**
Hydropower plants	279.9		429.7	
Thermal power plants	406.0		40.8	
Nuclear power plant*	348.0		2,651.1	
Other (CHP, solar, wind)	7.1		1.2	
Javno podjetje Energetika Ljubljana, d.o.o	**119.0**	**3.0%**	**258.8**	**2.5%**
CHP	110.2		203.4	
Generation using woody biomass	8.8		55.3	
Other small producers in the distribution network and in closed distribution systems**	**893.1**	**22.4%**	**1,673.9**	**16.4%**
Hydropower plants	127.5		320.0	
Solar power plants	624.0		627.0	
Wind farms	3.3		5.7	
Facilities using woody biomass	17.1		103.1	
Geothermal power plants	0.0		0.0	
Facilities using biogas	37.5		159.8	
CHP	83.7		458.3	
Total in Slovenia	**3,983.4**	**100.0%**	**10,203.3**	**100.0%**
- in the transmission system	**3,090.3**		**8,529.2**	

* taking into account the 50% share of Krško NPP's installed capacity and production
** Other small producers in CDS (Talum, Acroni, Ravne, Štore, Jesenice and Salonit) and generation in consumers' internal networks (also includes the estimated generation in self-supply devices)

SOURCE: ENERGY AGENCY, PRODUCERS, BORZEN, ELECTRIC SYSTEM OPERATORS

Compared to the previous year, the installed capacity with larger producers (the HSE and Gen group, and Energetika Ljubljana) did not change. The same applies to closed distribution systems (CDS), where the total installed capacity only increased in the solar power plants. The bigger changes involved the production facilities connected to the distribution network, where the power of the solar power plants connected to the distribution network increased by 165 MW, which is no less than 35%. This increase is largely due to the increased interest of household and small business consumers in self-supply based on the annual calculation of the received and delivered electricity. In 2022, 2 MW of facilities using biogas and 1.7 MW of solar power plants were taken offline.

41.9% renewable sources

32.1% fossil fuels

26% nuclear fuel –

Actual shares of primary electricity sources in Slovenia, taking into account 50% of electricity produced and delivered by the Krško NPP

The largest part of the electricity produced by small producers connected to the distribution system and CDS was generated by solar power plants, followed by industrial facilities for CHP, and small hydropower plants. In 2022, small producers generated 16.4% of electricity, which represents an increase of 2.1 percentage points compared to the previous year. The main reason for this is reduced generation by large power plants, which was mentioned in previous chapters.

Due to the intergovernmental agreement between Slovenia and Croatia, half of the Krško NPP's production belongs to Croatia, which reduces Krško NPP's share in actual Slovenian electricity production. In 2022, power plants in Slovenia thus generated a total of 12,853 GWh of electricity, while Slovenia's actual electricity production was lower, at 10,203 GWh. Compared to 2021, production decreased by 2152 GWh, which represents 17.4%.

The electricity balance of delivery and generation, shown in Figure 13 and Table 1, as well as the structure of energy sources in Figure 20 and Table 2, takes 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 the internal networks of final consumers, including the estimated electricity from self-supply devices. Considering the electricity generated in production facilities, connected in the internal networks of final consumers, and the 50% share generated by the Krško NPP, the primary sources for electricity generation in 2022 in the Republic of Slovenia were fossil fuels with 32.1%, nuclear fuel with 26%, and RES with 41.9%. Including by taking into account the electricity generated in internal consumer networks, the total amount of RES has seen a decline of 4.4 percentage points compared to 2021, mainly due to reduced electricity generation in the hydropower plants, which was roughly one-third lower in 2022.

TABLE 4: PRIMARY ENERGY SOURCES FOR ELECTRICITY GENERATION IN SLOVENIA IN THE 2020–2022 PERIOD

	2020		2021		2022	
PRIMARY SOURCES	**Generation [GWh]**	**Share of generation (%)**	**Generation [GWh]**	**Share of generation (%)**	**Generation [GWh]**	**Share of generation (%)**
Fossil fuels	4,433.2	33.3%	3,925.1	31.8%	3,279.6	32.1%
Nuclear fuel	3,020.4	22.7%	2,709.3	21.9%	2,651.1	26.0%
Renewable sources	5,861.5	44.0%	5,721.3	46.3%	4,272.6	41.9%
• Hydro	5,261.3		5,049.2		3,356.7	
• Solar	352.4		422.7		628.2	
• Wind	6.2		5.5		5.7	
• Biomass	144.9		153.1		122.2	
• Biogas	96.7		90.8		159.8	
TOTAL	**13,315.1**	**100.0%**	**12,355.7**	**100.0%**	**10,203.3**	**100.0%**

SOURCE: ENERGY AGENCY, PRODUCERS, ELECTRIC SYSTEM OPERATORS

Electricity Consumption

The total electricity consumption in Slovenia (taking into account the consumption by Avče PSHPP) in 2022 was 13,638 GWh, or 12,793 GWh without counting the transmission and distribution system losses. Compared to 2021, the total consumption decreased by 535 GWh, which is 3.8%, not taking into account the electricity generated and consumed behind the meters in the internal installations of consumers.

4.7% lower consumption by household consumers

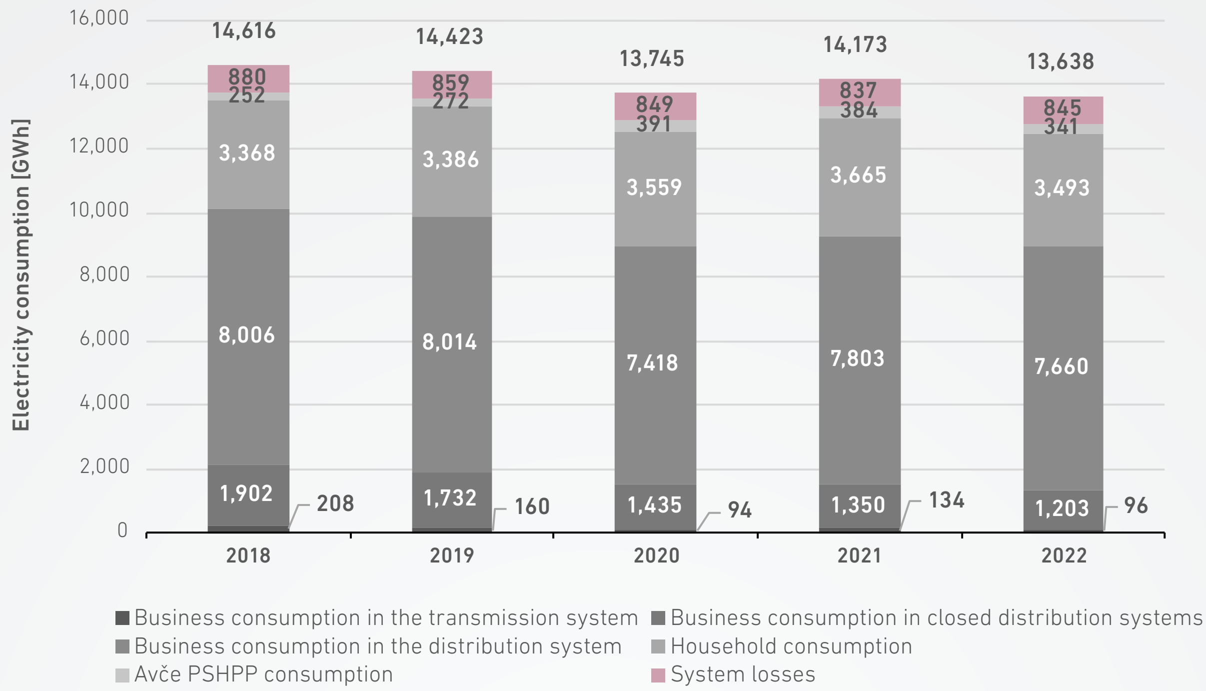
3.5% lower consumption by business consumers

There are three direct consumers connected to the transmission system, who consumed 96 GWh of electricity in 2022. 0.15 GWh of electricity was exported to Italy over the distribution system from DTS Vrtojba and DTS Sežana. The consumption of electricity by consumers in closed distribution systems was 1203 GWh, 147 GWh less than in 2021, mainly due to lower consumption in CDS Talum. The Avče pumped-storage hydropower plant consumed 341 GWh for pumping water into the storage basin, 43 GWh more than the year before. Electricity losses in the transmission and distribution system amounted to 845 GWh; this includes losses due to imports, exports and the transit of electricity.

3.9% lower consumption by final consumers

Consumption by business and household consumers in the distribution system was 11,152 GWh, which represents a decrease of 2.7% in comparison with 2021. In 2022, household consumers consumed 3493 GWh of electricity, a decrease of 4.7% compared to the previous year. Consumption by business consumers in the distribution system in 2022 was 7660 GWh, which is 1.8% less than in 2021. The total consumption by all final consumers (not including losses and consumption by Avče PSHPP) in 2022 was 3.9% lower than in 2021.

FIGURE 23: ELECTRICITY CONSUMPTION IN THE 2018–2022 PERIOD



SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

TABLE 5: ELECTRICITY CONSUMPTION IN THE 2020–2022 PERIOD

ELECTRICITY CONSUMPTION [GWh]	**2020**	**2021**	**2022**
Business consumption in the transmission system	94	134	96
Business consumption in the distribution system	7,418	7,803	7,660
Business consumption in closed distribution systems	1,435	1,350	1,203
TOTAL BUSINESS CONSUMPTION	**8,946**	**9,287**	**8,959**
HOUSEHOLD CONSUMPTION	**3,559**	**3,665**	**3,493**
• single-tariff metering	902	916	863
• dual-tariff metering	2,656	2,748	2,629
Total consumption by final consumers	**12,505**	**12,952**	**12,452**
Avče PSHPP consumption in the pumping regime	391	384	341
Losses in the transmission and distribution system	849	837	845
Total electricity consumption	13,745	14,173	13,638

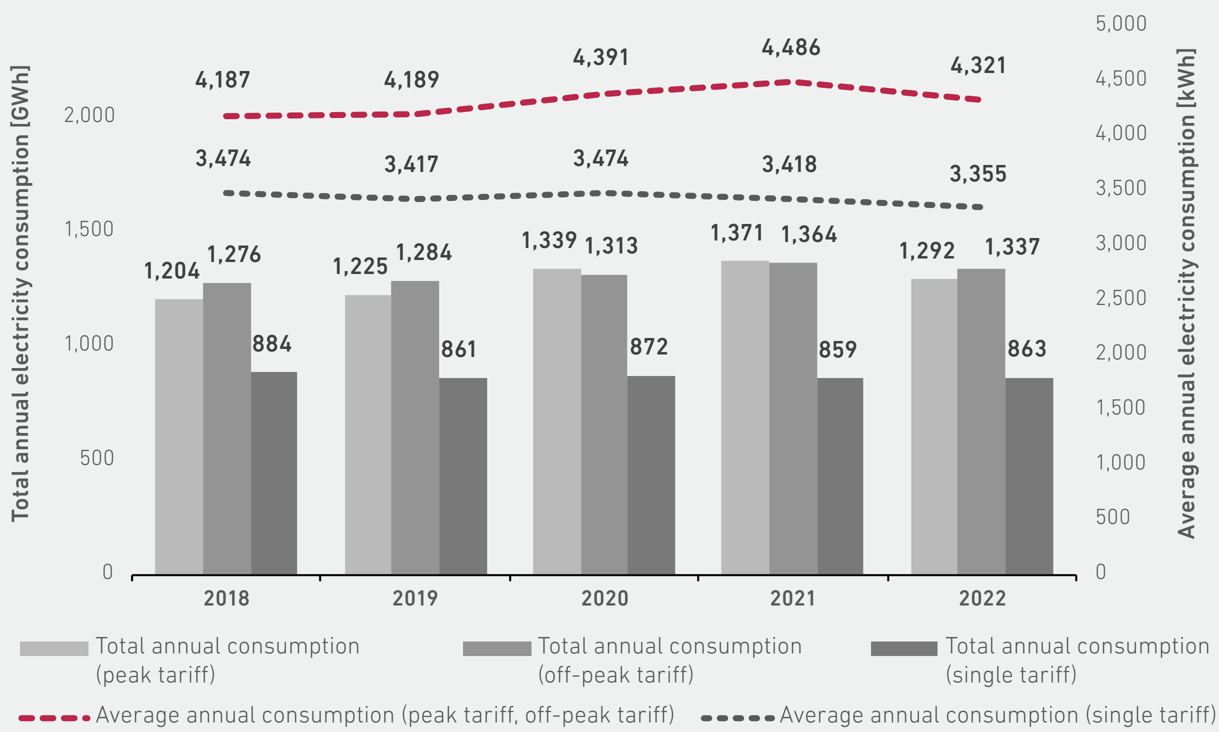
SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

Figure 24 shows the total and the average annual electricity consumption by household consumers with single- and dual-tariff metering; when calculating the average annual consumption, we also take into account the number of household consumers with each metering type.

For household consumers with dual-tariff metering, the five-year observation period showed that in 2022, there was a decrease in the total and average annual electricity consumption, after a multi-annual trend of constant growth. In 2022, for the first time in the observation period, we recorded a decrease in the number of consumers with dual-tariff metering.

Compared to the previous year, in 2022, we recorded a slightly lower average consumption of electricity in household consumers with single-tariff metering. The number of these household consumers rose for the first time in the observation period, namely by 2.4% compared to the year before, which is mainly due to the increased number of consumers opting for self-supply.

FIGURE 24: THE TOTAL AND THE AVERAGE ANNUAL ELECTRICITY CONSUMPTION BY HOUSEHOLD CONSUMERS WITH SINGLE- AND DUAL-TARIFF METERING IN THE 2018–2022 PERIOD



SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

Demand Covered by Domestic Production

The demand covered by domestic production represents the ratio of electricity consumption by final consumers to electricity production in Slovenia. As shown in Table 6, the largest contributors to domestic production are the large hydropower plants, thermal power plants and the nuclear power plant (with half of its generation), which are connected to the transmission system in Slovenia. A small part of the domestic production is connected to the distribution system.

70% of electricity demand covered with domestic production

TABLE 6: CONSUMPTION, PRODUCTION AND COVERAGE OF DEMAND WITH DOMESTIC PRODUCTION IN THE 2018–2022 PERIOD

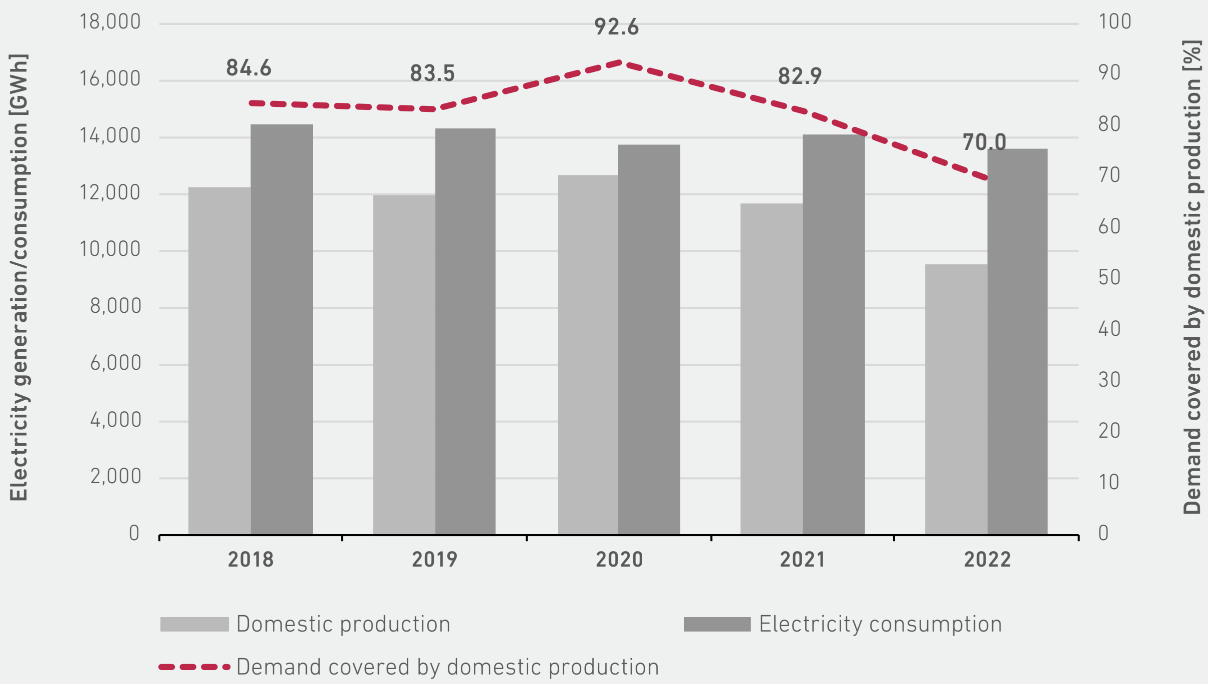
	2018	2019	2020	2021	2022
Generation in the transmission system [GWh]	**11,212**	**10,934**	**11,639**	**10,638**	**8,529**
hydropower plants	4,421	4,225	4,747	4,504	3,037
thermal power plants	4,049	3,946	3,872	3,429	2,841
nuclear power plant (50% share)	2,742	2,763	3,020	2,706	2,651
Generation in the distribution system [GWh]	**1,050**	**1,044**	**1,088**	**1,079**	**1,012**
Total domestic production [GWh]	**12,262**	**11,978**	**12,727**	**11,717**	**9,541**
Total electricity consumption [GWh]	**14,501**	**14,341**	**13,744**	**14,142**	**13,638**
total consumption by final consumers	13,484	13,292	12,506	12,952	12,452
system losses	880	858	849	837	845
Avče PSHPP consumption	252	271	391	384	341
export to Italy (DTS Vrtojba and Sežana)	–115	–81	–2	–31	–0.15
Demand covered by domestic production	**84.6%**	**83.5%**	**92.6%**	**82.9%**	**70.0%**

SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

In the 2018–2022 observation period, we observe inter-annual fluctuations in the amount of demand covered by domestic production. This amount is also directly affected by changes in electricity consumption. The dynamics and structure of the total demand are explained in more detail in the previous chapter. In addition to the consumption by final consumers in the transmission and distribution system, the total electricity demand also includes losses in the entire electricity system. The quantities of electricity exported to Italy through the distribution system via DTS Vrtojba and DTS Sežana are not counted as final consumption in Slovenia.

As Figure 25 illustrates, the proportion of demand covered by domestic production during the observation period peaked in 2020 (92.6%). In 2022, the electricity demand covered by domestic production was only 70%, mainly due to significantly lower production from hydropower due to drought, and the temporary shut-off of TEŠ 6 due to coal saving.

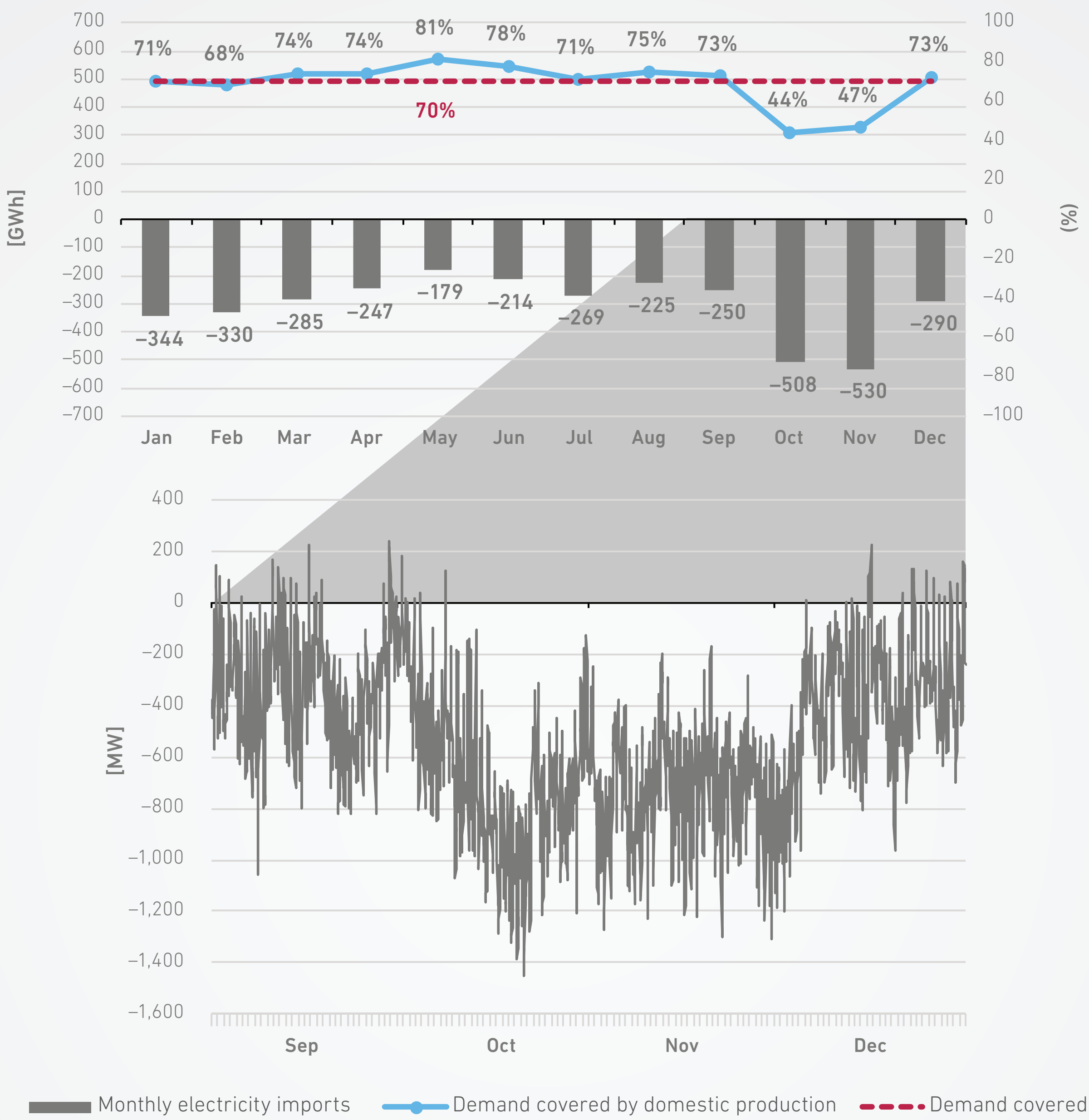
FIGURE 25: CONSUMPTION, PRODUCTION AND COVERAGE OF DEMAND WITH DOMESTIC PRODUCTION IN THE 2018–2022 PERIOD



SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

During the year, the share of import dependency was the highest in the autumn months, when the biggest production unit of TEŠ 6 and the Krško NPP were not operating. At the time, the Krško NPP was undergoing its regular overhaul. In October and November, the monthly amount of imports reached over 500 GWh per month, while on an hourly basis, the transmission network enabled the import of 1,400 MW, which, considering the high degree of reliable supply, proved that the Slovenian transmission system is robust.

FIGURE 26: MONTHLY AND HOURLY DYNAMICS OF CONSUMPTION COVERAGE WITH DOMESTIC PRODUCTION AND THE NECESSARY IMPORT OF ELECTRICITY IN 2022, WITH A FOCUS ON THE DYNAMICS OF THE LAST FOUR MONTHS



SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

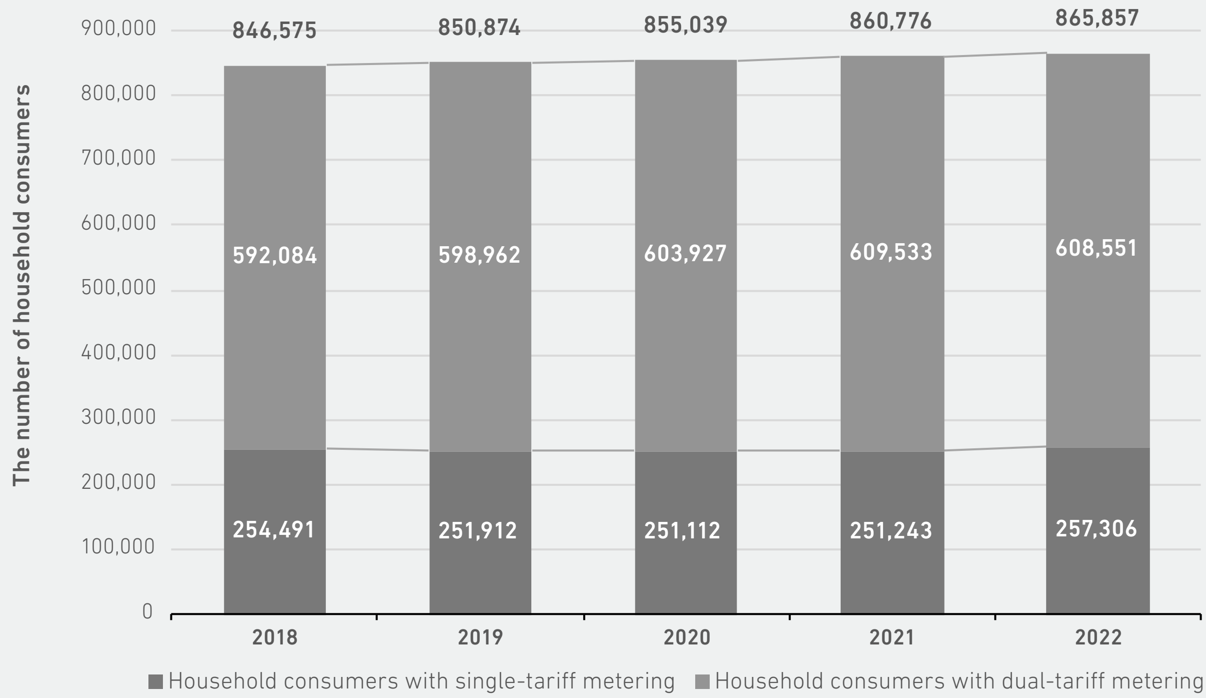
Consumers in the Electricity System

By the end of 2022, 976,623 final consumers of electricity were connected to the Slovenian electricity system. Their number has increased by 4,874 or 0.5% compared to 2021.

0.2% fewer business consumers of electricity

Figure 27 shows the evolution of the number of household consumers in the 2018–2022 period. The total number of household consumers increased by an average of 0.5% per year during this period, with the number of household consumers with single-tariff metering increasing again in 2022, this time by 2.4%. An analysis of the consumer structure data shows that this unusual reversal is due to the increasing number of consumers switching to self-supply with annual consumption netting and single-tariff metering.

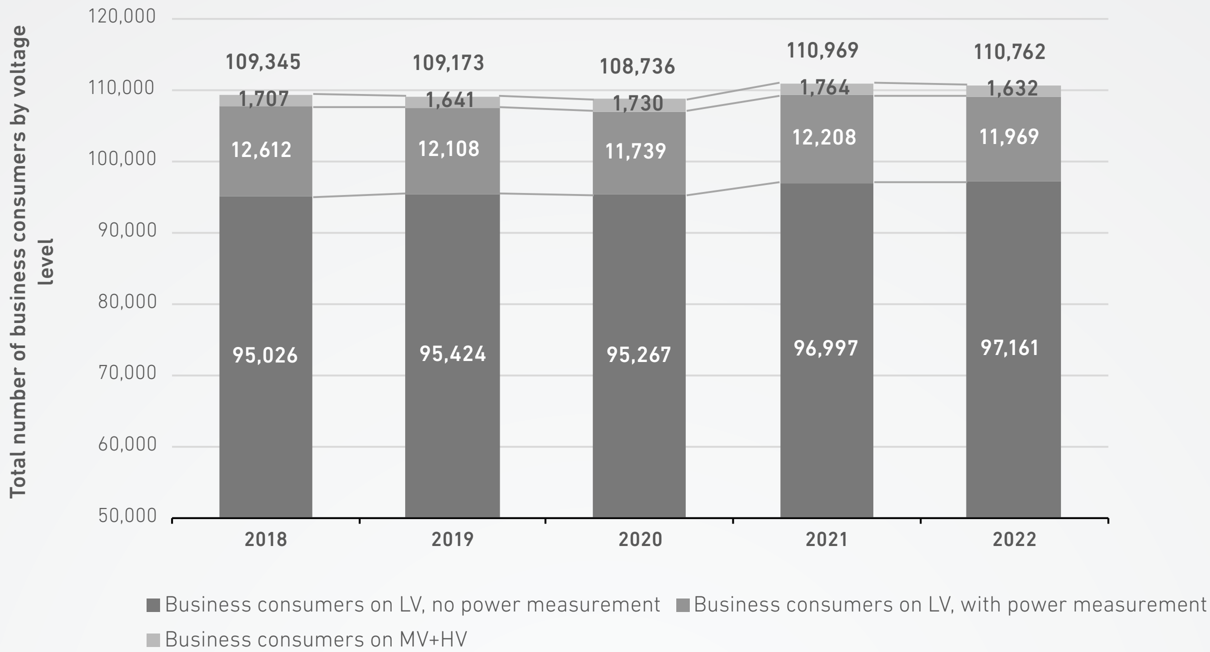
FIGURE 27: THE NUMBER OF HOUSEHOLD CONSUMERS IN THE 2018–2022 PERIOD



SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

Figure 28 shows the evolution of the total number of business consumers in the distribution system and in closed distribution systems, shown by individual voltage level. After the number of business consumers increased in 2021, 2022 saw a decrease in the number of these consumers by 0.2% on all voltage levels. The LV consumer group saw a slight increase in business consumers without (peak) load metered, but instead determined on the basis of the current limiting device rating. Their share now amounts to 87.7% of all business consumers. On the other hand, there was a decrease in the number of LV consumers, whose (peak) load is metered.

FIGURE 28: THE NUMBER OF BUSINESS CONSUMERS IN DISTRIBUTION SYSTEMS AT DIFFERENT VOLTAGE LEVELS IN THE 2018–2022 PERIOD



SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

In 2022, 823 business and 104 household consumers with an installed production unit were connected to the distribution system under the PS.2 connection scheme and 1,639 business and 25,743 household consumers were connected in the self-supply system with annual consumption netting. 2.9% of all consumers in the distribution system were both consumers and producers of electricity, an increase of 1.3 percentage points compared to the year before.

2.9% share of consumers who are also producers

The number of business consumers connected to the transmission system remained unchanged from the previous year. They were three business consumers at five delivery points, as well as four closed distribution system operators at five locations supplying electricity to 210 business consumers, seven of which have an installed production unit.

TABLE 7: THE NUMBER OF FINAL CONSUMERS OF ELECTRICITY BY TYPE OF CONSUMPTION IN THE 2020–2022 PERIOD

The number of final consumers of electricity by type of consumption	**2020**	**2021**	**2022**
Business consumers in the transmission system	3	3	3
Avče PSHPP consumption in the pumping regime	1	1	1
Total number of final consumers in the transmission system	**4**	**4**	**4**
Business consumers in the distribution system	108,505	110,766	110,552
Household consumers	855,039	860,776	865,857
• single-tariff metering	251,112	251,243	257,307
• dual-tariff metering	603,927	609,533	608,552
Total number of final consumers in the distribution system	**963,544**	**971,542**	**976,409**
Business consumers in closed distribution systems	231	203	210
Household consumers	0	0	0
Total number of final consumers in closed distribution systems	**231**	**203**	**210**
TOTAL NUMBER OF END CONSUMERS	**963,779**	**971,749**	**976,623**

SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

TABLE 8: THE NUMBER OF FINAL CONSUMERS OF ELECTRICITY BY TYPE OF CONNECTION IN THE 2020–2022 PERIOD

TYPE OF FINAL CONSUMER CONNECTION	Final consumers in the distribution system			Final consumers in closed distribution systems			TOTAL		
	2020	2021	2022	2020	2021	2022	2020	2021	2022
Without grid-connected production facilities									
Business	107,326	109,180	108,091	209	197	203	107,535	109,377	108,294
Household	846,783	846,606	840,010	0	0	0	846,783	846,606	840,010
TOTAL	954,109	955,786	948,101	209	197	203	954,318	955,983	948,304
Installed production unit									
Business	717	712	823	13	6	6	730	718	829
Household	49	107	104	0	0	0	49	107	104
TOTAL	766	819	927	13	6	6	779	825	933
Self-supply									
Business	462	874	1,638	9	0	1	471	874	1,639
Household	8,207	14,063	25,743	0	0	0	8,207	14,063	25,743
TOTAL	8,669	14,937	27,381	9	0	1	8,678	14,937	27,382
Final consumers in the distribution system and in the closed distribution systems									
Business	108,505	110,766	110,552	231	203	210	108,736	110,969	110,762
Household	855,039	860,776	865,857	0	0	0	855,039	860,776	865,857
TOTAL	963,544	971,542	976,409	231	203	210	963,775	971,745	976,619
Final consumers in the transmission system							4	4	4
TOTAL NUMBER OF FINAL CONSUMERS							**963,779**	**971,749**	**976,623**

SOURCES: ENERGY AGENCY, ELECTRICITY SYSTEM OPERATORS

Renewable Sources

Share of Renewables in the Final Consumption

Slovenia has set out its objectives, policies and measures in the areas of decarbonisation, energy efficiency, energy security, the internal market, research, innovation and competitiveness until 2030 in the Integrated National Energy and Climate Plan (NECP). In 2023, this action/strategy document is being brought up to date and into alignment with the current ambitious EU targets. In the current NECP, Slovenia has committed to reducing its total greenhouse gas emissions by 36%, improving energy efficiency by at least 35% with respect to a 2005 baseline and achieving at least a 27% share of energy from RES in the final consumption. The sectoral target shares for 2030 specified by the NECP, which together amount to a 27% share of energy from RES in the gross final consumption, are as follows:

- 43% share of RES in the electricity sector,
- 41% share of RES in the heating and cooling sector and
- 21% share in the transport sector.

Based on the planned growth in the total share of RES in the final electricity consumption in Slovenia set out in the NECP, which anticipates a 27% share of RES in the gross final consumption by 2030, the total share of RES achieved in 2022 should be 25.4%.

In 2021, Slovenia maintained the target 25% share of RES from 2020. This was achieved by supplementing the actual 24.6% share of RES in the total gross final consumption with a statistical transfer of 208 GWh of energy from RES from another member country. The share was 35% in the electricity sector, 35.2% in the heating and cooling sector and 10.6% in the transport sector.

For 2022, the share of RES in total gross final consumption is estimated at 23%, which is 1.6 percentage points lower than the RES share achieved in 2021, which excludes statistical energy transfers, and 2.4 percentage points lower than the planned RES share for 2022 in the NECP. The decrease in the share of RES is primarily due to the decrease in the share of RES in transport, which is estimated at 6.9% for 2022, mainly as a result of the increase in energy use in transport with the concurrent decrease in the use of biofuels. The estimated share of RES in the electricity sector increased to 37.1% – 2.1 percentage points higher than in 2021. This is primarily a consequence of the reduction in the use of energy in 2022 by as much as 3% per SURS data. The share of RES in the heating and cooling sector is also estimated to be one percentage point lower than in 2021.

23% estimated share of RES in 2022

TABLE 9: RES TARGETS ACHIEVED IN 2005 AS THE BASE YEAR AND IN THE 2010–2021 PERIOD, ALONG WITH AN ESTIMATE FOR 2022

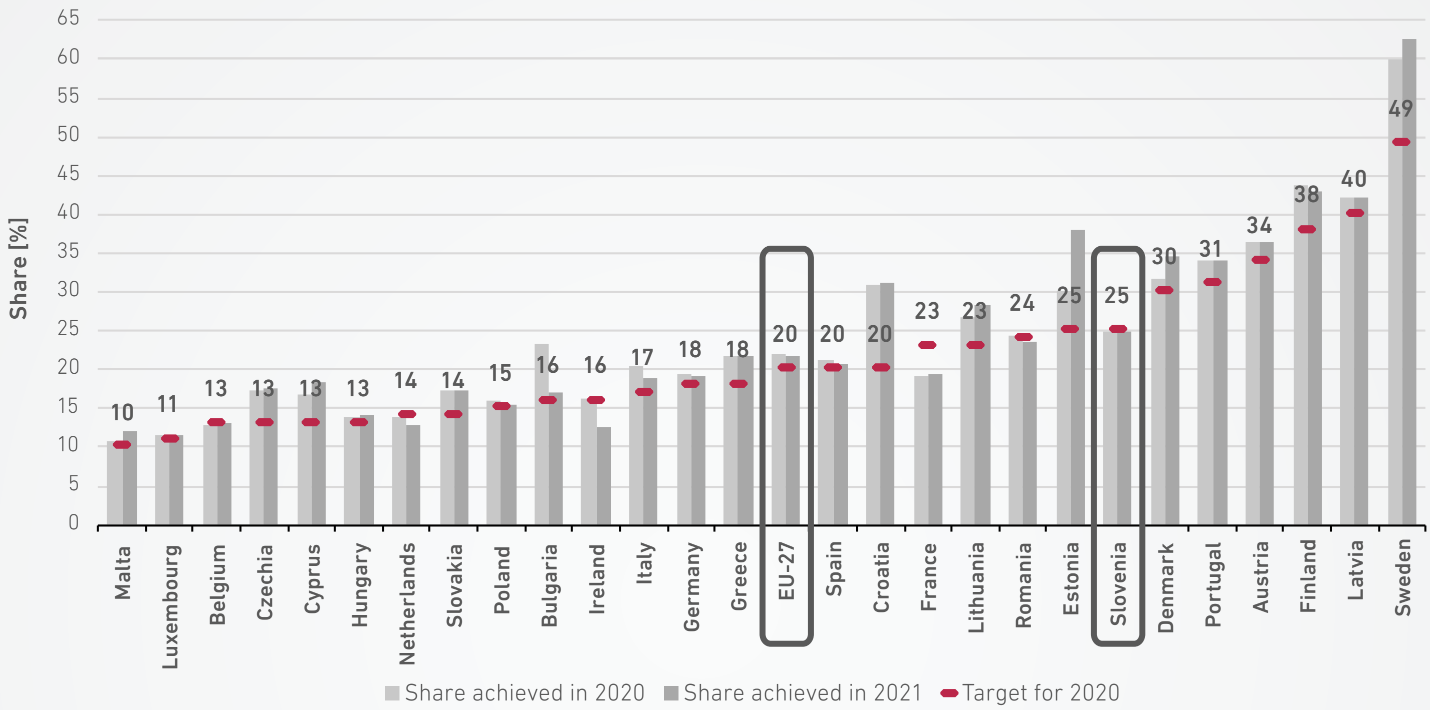
	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2030
RES share (%)														estimate	Target share
RES share	**19.8**	**21.1**	**20.9**	**21.6**	**23.2**	**22.5**	**22.9**	**22.0**	**21.7**	**21.4**	**22.0**	**25.0**	**25.0**	**23.0**	**27**
RES – heating and cooling	26.4	29.5	31.8	33.2	35.1	34.6	36.2	35.6	34.6	32.3	32.1	32.1	35.2	34.2	41
RES – electricity	28.7	32.2	31.0	31.6	33.1	33.9	32.7	32.1	32.4	32.3	32.6	35.1	35.0	37.1	43
RES – traffic	0.8	3.1	2.5	3.3	3.8	2.9	2.2	1.6	2.6	5.5	8.0	10.9	10.6	6.9	21

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

Figure 29 shows that with the exception of France, all the EU members achieved their national RES targets for 2020, with many even exceeding them. In 2021, most countries maintained or increased the share of RES, continuing the previous trend.

In 2020, the EU target share for that year was also exceeded by 2.1 percentage points, at 22.1%, while in 2021, the EU's share was 21.8%, which is 0.3% lower than in 2020.

FIGURE 29: RES SHARES ACHIEVED BY EU COUNTRIES



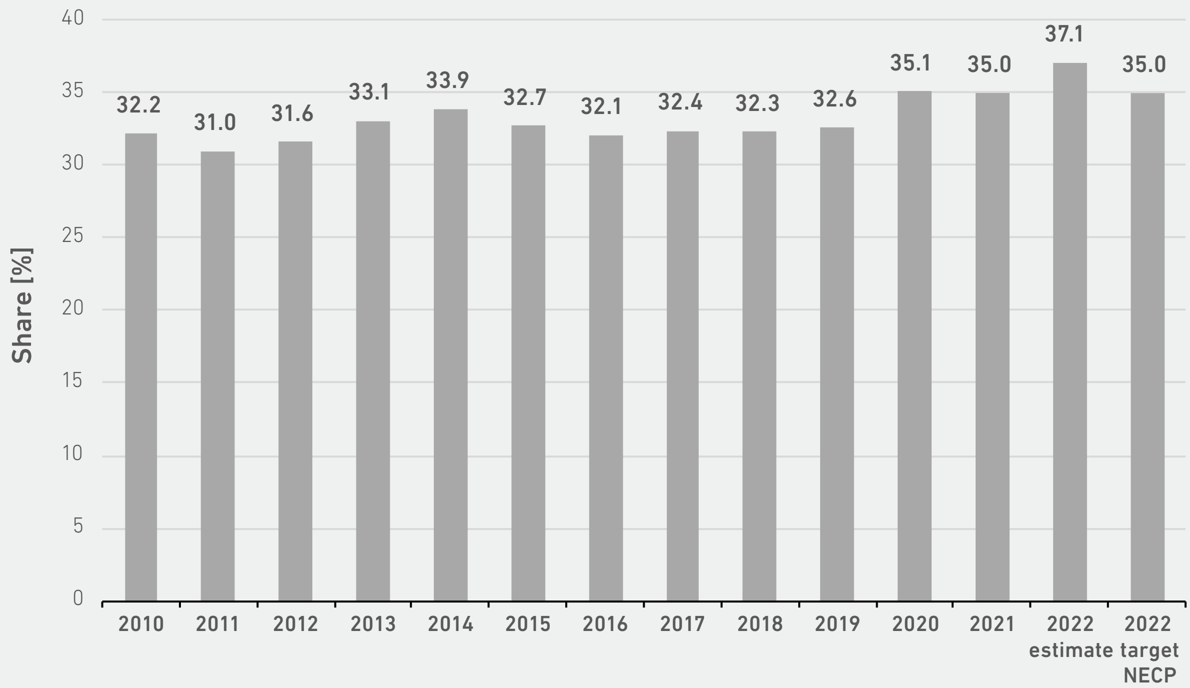
SOURCE: EUROSTAT

As the now binding 32% overall EU-wide RES target by 2030 will eventually be replaced by new, even more ambitious targets defined under REPowerEU, most countries will need to intensively pursue the development of additional RES power generation over the next few years while concurrently increasing their energy efficiency to a considerable degree. The new EU target for 2030 of 40%, which is higher than the current target by 8 percentage points, will almost double the current share of RES in the EU.

Share of Renewables in the Electricity Sector

The NECP sets out sectoral targets for the 2021–2030 period, including a 43% target share of electricity from RES in the electricity sector by 2030. The NECP likewise lays out the projected evolution of the RES share in the final consumption in the 2020 to 2030 period by individual sector, starting out with a 33.5% share of RES in the final energy consumption in the electricity sector in 2020 as the base year. This share was exceeded in both 2020 and 2021, amounting to 35.1% in 2020 and 35% in 2021, outperforming the NECP projections by 0.6%. In the 2005 to 2021 period, the RES share in this sector increased by 6.28%; in 2022, the estimated share for the electricity sector is 37.1%, which exceeds the NECP projections for this year by 2.1 percentage points.

FIGURE 30: RES SHARES IN THE ELECTRICITY SECTOR IN THE 2010–2021 PERIOD AND AN ESTIMATE FOR 2022



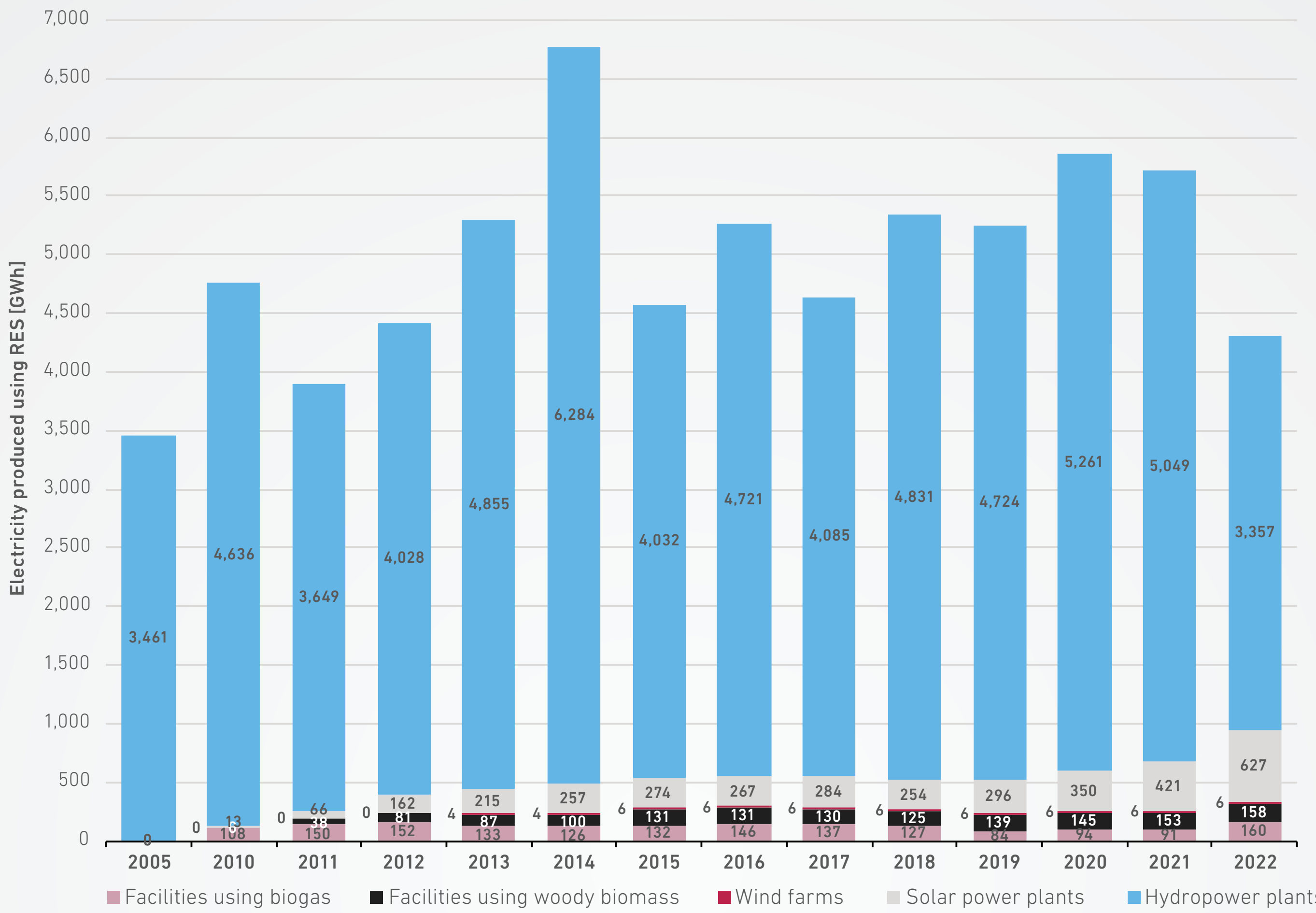
SOURCES: THE JOŽEF STEFAN INSTITUTE, SURS (STATISTICAL OFFICE OF THE REPUBLIC OF SLOVENIA)

Production from Renewable Sources

Solar power plants produced 49% more electricity than in 2021

In 2022, 4308 GWh of electricity from RES was produced in Slovenia, which is 25% less than in 2021. The markedly lower production of electricity from RES in 2022 compared to the previous years was mainly due to the poor hydrological conditions, which resulted in 34% less electricity being produced by hydropower plants in 2022 than in 2021. At the same time, it is encouraging that in recent years, mainly due to the growth in self-supply, the production of electricity from solar power plants has been increasing. In 2022, the production increased by 49% over 2021. Even so, the bulk of electricity from RES continues to be produced in hydropower plants, which have traditionally represented the chief renewable electricity source in Slovenia. The introduction of the RES and CHP support scheme in 2009, along with the introduction of the self-supply of electricity from RES, provided an incentive for investors to invest in electricity generation from other RES, primarily solar power plants, but also including biomass and biogas, which are not directly dependent on weather factors. Production from solar and hydropower plants, however, is weather-dependent and can fluctuate dramatically from year to year, given the same amount of production capacity.

FIGURE 31: ELECTRICITY PRODUCTION USING RES IN THE 2005 BASE YEAR AND IN THE 2012–2022 PERIOD



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

Incentives for Production from Renewable Sources

The development of electricity production from RES plays a key role in reducing greenhouse gas emissions. Since this is one of the most important activities for achieving the common objectives of sustainable development of the energy sector, EU countries can introduce a number of measures and incentives to encourage the development of this type of production that count as state aid. The main criterion taken into account when approving state aid is whether it will have an incentive effect, meaning that without the aid, the measure would not be carried out, or would not be carried out to the same extent.

Since 2009, Slovenia has had a state aid scheme, a support scheme for electricity production using RES and CHP, which comes in the form of guaranteed prices and premium tariffs. In addition to state aid, funds for RES development are also available in the form of investment incentives, mostly as part of cohesion policy measures. In 2022, grants for co-financing the purchase and installation of solar power production devices were made available.

Self-supply by final consumers has also had an important influence on the development of RES in recent years. This is implemented on the basis of the Decree on the Self-Supply of Electricity from Renewable Energy Sources and is aimed at household and small business consumers who connect production facilities to generate electricity from RES to the internal wiring of the buildings where they are installed. On the basis of the ZSROVE, a new Decree on the Self-Supply of Electricity from Renewable Energy Sources was enacted in April 2022. A major change with respect to the current regime is the revised calculation of network charges and levies for all production facilities entering the self-supply system after 2024. Until the end of 2024, household and small business consumers can still enter the self-supply system under the previous regime.

RES and CHP Support Scheme

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

In 2022, due to the rising reference costs, the Agency published one open call inviting investors to apply with their RES and CHP production facility projects for admission to the support scheme. In keeping with the guidelines plan of operation of the RES and CHP support scheme for 2022, which was outlined in the 2021 Energy Balance of the Republic of Slovenia, EUR 10 million was made available. The open call was published in October 2022. As before, promoters could submit their projects alongside investors. Natural-gas-fired CHP facilities were not permitted to apply to the open call, in accordance with the Act on Measures for the Management of Crisis Conditions in the Field of Energy Supply.

The open call, which closed in January 2023, attracted 51 applications for production facilities, most of which (39) were, once again, solar power plant projects, with a total rated electrical capacity of 12.62 MW. The applying projects also included four fossil fuelled CHP facilities with a 0.106 MW total rated capacity, three hydropower plants, including a new build, with a total rated capacity of 0.28 MW, three woody biomass-fired power plants totalling 0.55 MW of rated capacity and two biogas-fuelled power plants with a total rated capacity of 0.27 MW. The Agency approved 43 of the 51 applying projects, totalling 12.23 MW of rated electrical capacity. Most of the approved projects were solar power plants—36, with a total rated electrical capacity of 11.87 MW. As the projected cost values of electricity production in most of the applying projects were lower than the reference price of electricity in 2022, which was 120.67 EUR/MWh, only EUR 134,035.98 of the available EUR 10 million was administratively allocated.

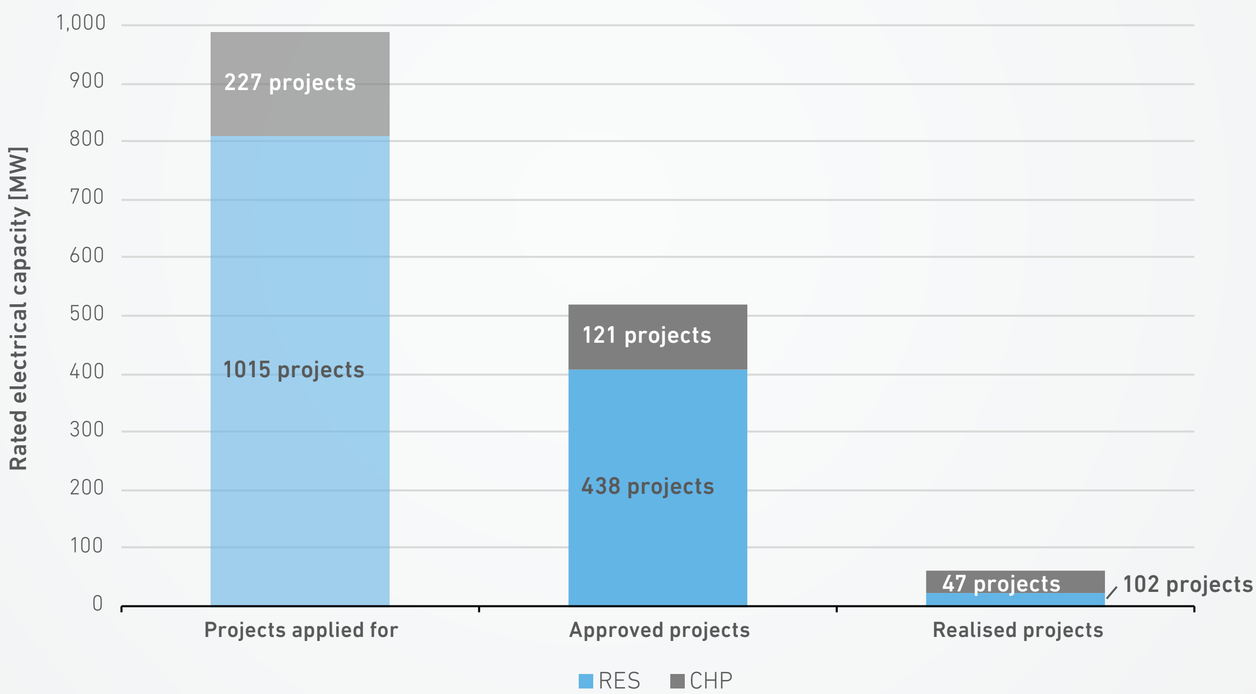
TABLE 10: AN OVERVIEW OF THE PRODUCTION FACILITY PROJECTS APPLYING TO AND SELECTED IN OPEN CALLS IN 2022, GROUPED ACCORDING TO THE TECHNOLOGY EMPLOYED FOR ELECTRICITY GENERATION

Open call—October 2022		Applying projects		Selected projects	
Technology	**Renovated/ New**	**No. of projects**	**Installed capacity [MW]**	**No. of projects**	**Installed capacity [MW]**
Hydropower plants	**New**	1	0.09	1	0.09
Hydropower plants	**Renovated**	2	0.19	1	0.02
Solar power plant	**New**	39	12.62	36	11.87
Facilities using landfill gas	**New**	1	0.16	0	0.00
Facilities fuelled by biomass-derived biogas	**New**	1	0.11	0	0.00
Woody biomass-fuelled facilities	**New**	3	0.55	1	0.14
Fossil fuelled CHP	**New**	3	0.07	3	0.07
Fossil fuelled CHP	**Renovated**	1	0.03	1	0.03
Total number of applications		**51**	**13.82**	**43**	**12.23**

SOURCE: ENERGY AGENCY

Since the changes to the support scheme in 2016, the Agency has held 11 open calls inviting investors to apply with their RES and CHP production facility projects for admission to the support scheme. Across all the calls, applicants have submitted a total of 1242 production facility projects with a total rated electrical capacity of 989 MW, including 808 MW of RES projects and 181 MW of CHP projects. 559 production facilities were approved, with a total rated electrical capacity of 520 MW. This included 438 RES projects with a total rated electrical capacity of 407 MW and 121 CHP projects with a total rated capacity of 113 MW. For 83 projects, with a total rated capacity of 115 MW, the project approval decision lapsed due to the applicants' failure to realise the project within the legal deadline. For them, entry into the support scheme is therefore no longer possible on the basis of that decision. The approved production facility projects must be realised within three years (or five years for complex projects) of the date of the project approval notification. Wind farms represent the majority of the unrealised projects. It needs to be pointed out that in most cases, the failure of these projects is due to the difficulties in siting the production facilities and, consequently, in obtaining the construction licences. Accordingly, only 149 projects with a total rated capacity of 63 MW have been realised. In terms of the number of projects realised, solar power plants dominate, with a total rated capacity of 10 MW, while 47 projects are CHP production facilities with a total rated capacity of 39.4 MW, with 25.9 MW being renovations of existing CHP facilities.

FIGURE 32: THE NUMBER AND RATED ELECTRICAL CAPACITY OF THE PROJECTS FOR RES AND CHP PRODUCTION FACILITIES THAT APPLIED AND WERE SELECTED AND CARRIED OUT IN ALL THE OPEN CALLS



SOURCE: ENERGY AGENCY

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

By the end of 2022, 3718 production facilities had been included in the support scheme, which is 93, or 2.4%, fewer than by the end of 2021. Of these, 3,392 RES production facilities are covered by the support scheme, with solar power plants still accounting for most of them, along with 326 fossil-fuelled CHP facilities, which is 10.9% fewer than at the end of 2021. The number of production facilities covered by the support scheme has thus declined for the seventh consecutive year. The main reason for this is the cessation of support eligibility due to the age limit of the production facilities eligible for support (15 years from the start of operation for RES and 10 years for CHP). There have also been a few exits from the support scheme due to improved market conditions.

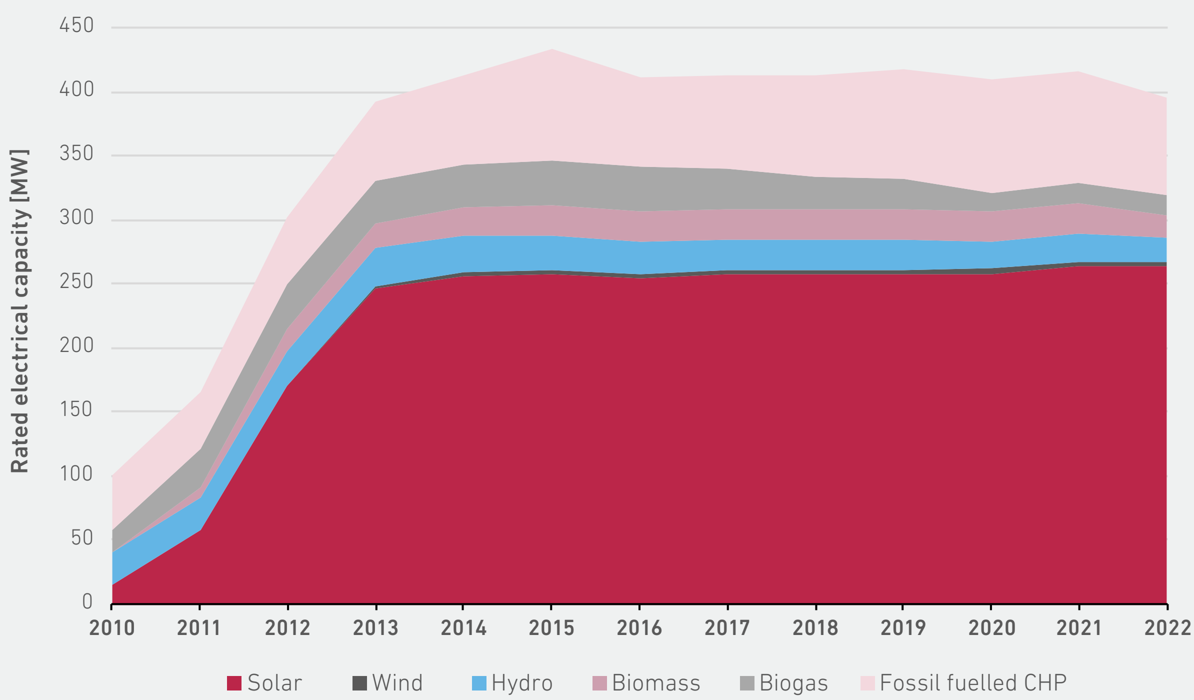
TABLE 11: THE NUMBER OF PRODUCTION FACILITIES IN THE SUPPORT SCHEME AND THE DYNAMICS OF THEIR INCLUSION IN THE 2010–2022 PERIOD

Source	The number of facilities participating in the support scheme												
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
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
Wind	3	4	3	5	4	9	7	7	6	4	4	3	2
Hydro	105	109	108	106	106	106	98	91	93	92	90	92	85
Biomass	0	3	5	10	19	43	44	43	44	46	40	40	38
Biogas	13	26	31	31	31	33	32	31	27	24	22	24	22
Fossil fuelled CHP	26	46	89	184	270	390	384	380	388	388	386	366	326
Total	528	1,163	2,642	3,554	3,749	3,920	3,888	3,864	3,859	3,858	3,839	3,811	3,718

SOURCES: ENERGY AGENCY, BORZEN

As a result, the total rated electrical power of the production facilities in the support scheme at the end of 2022 was 395.2 MW, which is lower than at the end of 2021, when it totalled 415.3 MW. The biggest drop, 9.8 MW, was seen with fossil-fuelled CHP facilities.

FIGURE 33: THE TOTAL RATED ELECTRICAL CAPACITY OF THE PRODUCTION FACILITIES INCLUDED IN THE SUPPORT SCHEME IN THE 2010–2022 PERIOD

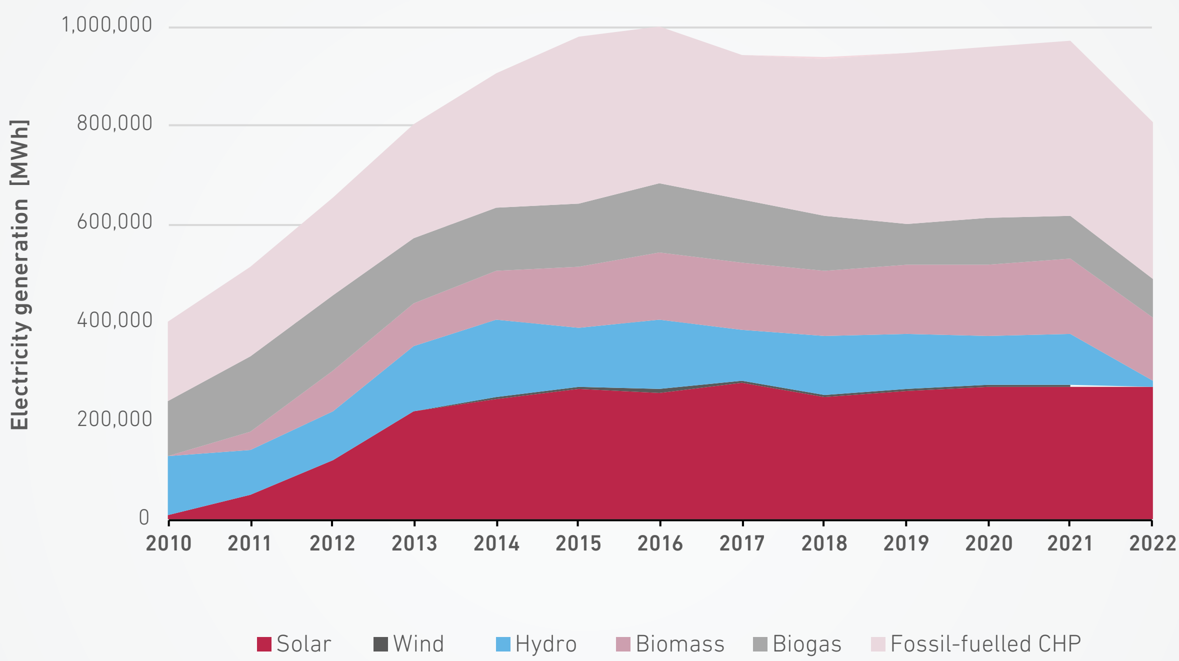


SOURCES: ENERGY AGENCY, BORZEN

The amount of electricity for which support was paid also fell significantly in 2022, amounting to 800.8 GWh of electricity produced from RES, or 172.4% less than in 2021. The largest drop in the quantity of electricity that support was paid for was due to the cessation of support for production facilities that aged out of support eligibility, as well as the fact that in the case of 143 facilities producing electricity from RES, support was not paid out due to the value of that electricity ending up lower than the reference price of electricity. In addition, the first two-thirds of 2022 were characterised by extraordinarily poor hydrological conditions.

In 2022, support was therefore paid out for 483.5 GWh of renewable electricity, with most of it, namely 261.5 GWh, going to solar power. 317.3 GWh worth of support went to electricity produced in CHP facilities.

FIGURE 34: ELECTRICITY PRODUCTION ELIGIBLE FOR SUPPORT IN THE 2010–2022 PERIOD



SOURCES: ENERGY AGENCY, BORZEN

Support was paid for 800.8 GWh, or 7.8%, of the total electricity generated in 2022 in Slovenia. The Energy Agency monitors this share due to the impact that electricity production eligible for financial support can have on the wholesale prices on the market. Introducing support schemes increases the supply of subsidised energy on the market, potentially leading to disruption. This can lead to downward pressure on the wholesale price of electricity not eligible for support, severely compromising the viability of conventional power plants. The issue with this is that the latter remain indispensable due to the variability in electricity generation at RES facilities.

Support was paid out for 7.8% of all the electricity generated in Slovenia

The Agency found that both the share of electricity and the share of installed capacity of power plants covered by the support scheme have not changed significantly since 2018. The shares for previous years are shown in Table 12.

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

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 [MW]	Electricity generated for which support is paid [GWh]	Total Slovenian electricity generation [GWh]	Share of the generated electricity included in the support scheme [MW]
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%

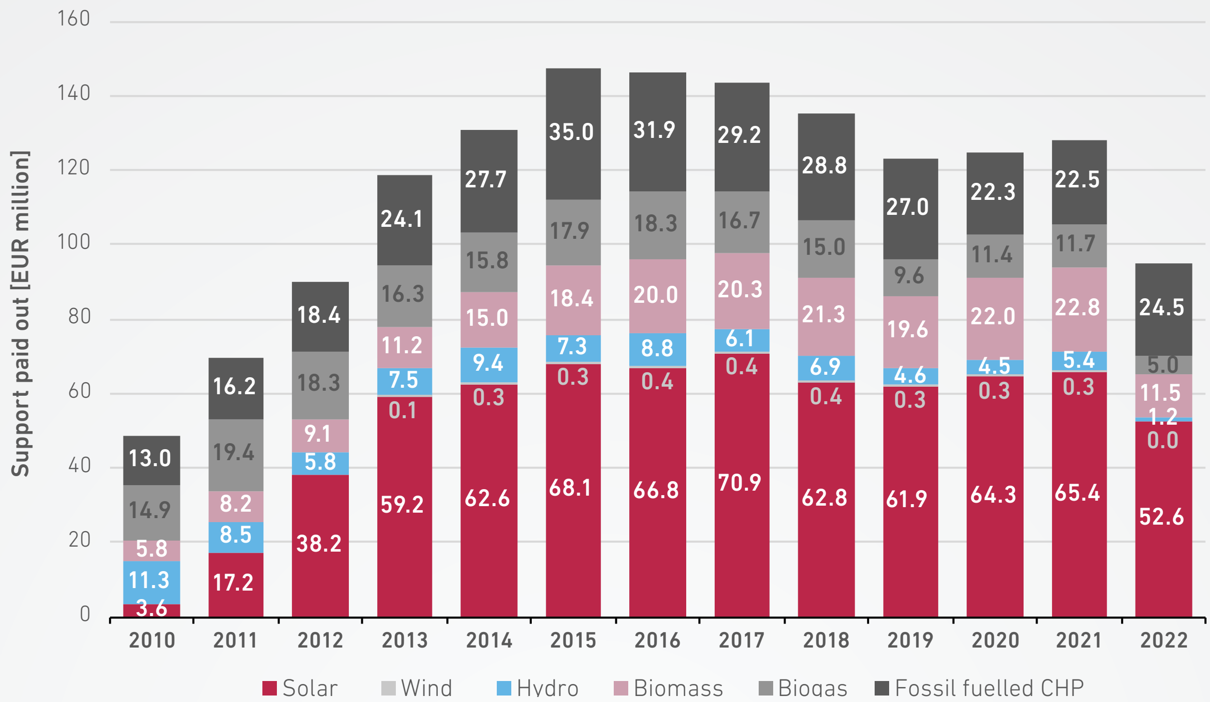
SOURCES: ENERGY AGENCY, BORZEN

Support Paid Out—Support Scheme Costs

EUR 33.3 million less support paid out due to the high reference price for electricity

In 2022, EUR 94.8 million was paid to support-eligible electricity producers. EUR 70.3 million was paid out for electricity generated from RES, representing 74.2% of the total, and EUR 24.5 million for electricity generated from fossil-fuelled CHP, representing 25.8% of the total. In terms of payments for electricity generated from RES, support paid for electricity generated by solar power plants continues to dominate, with EUR 52.6 million, or 55.5% of the total payments. This is followed by power plants using woody biomass accounting for EUR 11.5 million, or 12.1% of total payments, and biogas plants with EUR 5 million, or 5.3% of the total payments. Only EUR 1.2 million was paid out for electricity generated in hydropower plants, which represents 1.3% of the total funds paid out and only 22.2% of the funds paid out for hydroelectricity in 2021. This is mainly due to the high reference price for electricity.

FIGURE 35: THE VALUE OF SUPPORT PAY-OUTS IN THE 2010–2022 PERIOD



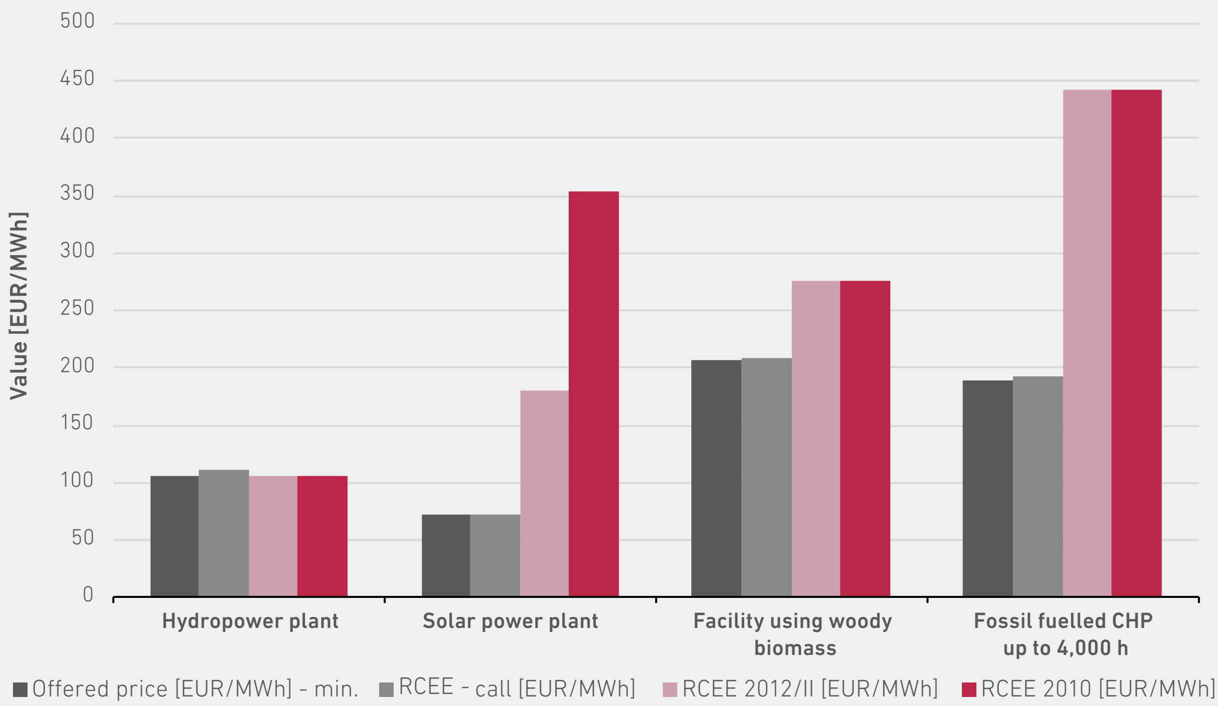
SOURCE: BORZEN

In 2022, EUR 8.9 million was paid out for electricity produced in production facilities built under approved projects in open calls, of which EUR 6.8 million, or 76.4%, was for electricity produced in CHP plants. This is due to the high price of natural gas. Between 2010 and 2022, producers were paid EUR 1.5 billion in support under the support scheme, for a total of 10.8 TWh of electricity generated.

In 2022, EUR 33.3 million less was paid than in 2021. The main reason for the considerably lower support payments is the significantly higher reference price for electricity in 2022 of 120.67 EUR/MWh, 151.2% higher than the 48.04 EUR/MWh it was in 2021. As a result, the volume of payments within the premium tariff scheme – premium tariff being defined as the difference between the electricity price or reference cost of production at the production facility and the reference market price of electricity – received by around 70% of producers, has fallen sharply. In 2022, in the case of as many as 143 production facilities, producers were paid no support for the electricity generated as the price of electricity from those production facilities was lower than the reference price for electricity.

The fall in the component prices of individual technologies on the market and the introduction of competitive selection procedures for RES and CHP projects have reduced the support values, most notably for electricity from solar CHP facilities and plants using woody biomass. A megawatt-hour of electricity generated in production facilities using the technologies selected in open calls requires, on average, significantly less support than the electricity generated in production facilities that were included in the support scheme before the support scheme amendments came into effect. As a result, the average amount of support paid out per MWh of electricity produced in production facilities selected in open calls in 2022 was 44.22 EUR/MWh, whereas the average value of support provided for the electricity produced in production facilities predating the support scheme amendments was 120.14 EUR/MWh.

FIGURE 36: A COMPARISON OF THE OFFERED PRICES OF ELECTRICITY AMONG THE SELECTED PROJECTS OF SOME OF THE TECHNOLOGIES INCLUDED IN THE OCTOBER 2022 OPEN CALL AND THE REFERENCE COSTS OF ELECTRICITY PRODUCTION USING THESE SAME TECHNOLOGIES BEFORE AND AFTER THE AMENDMENTS TO THE RES AND CHP SUPPORT SCHEME



SOURCE: ENERGY AGENCY

Renewable Electricity Self-Supply

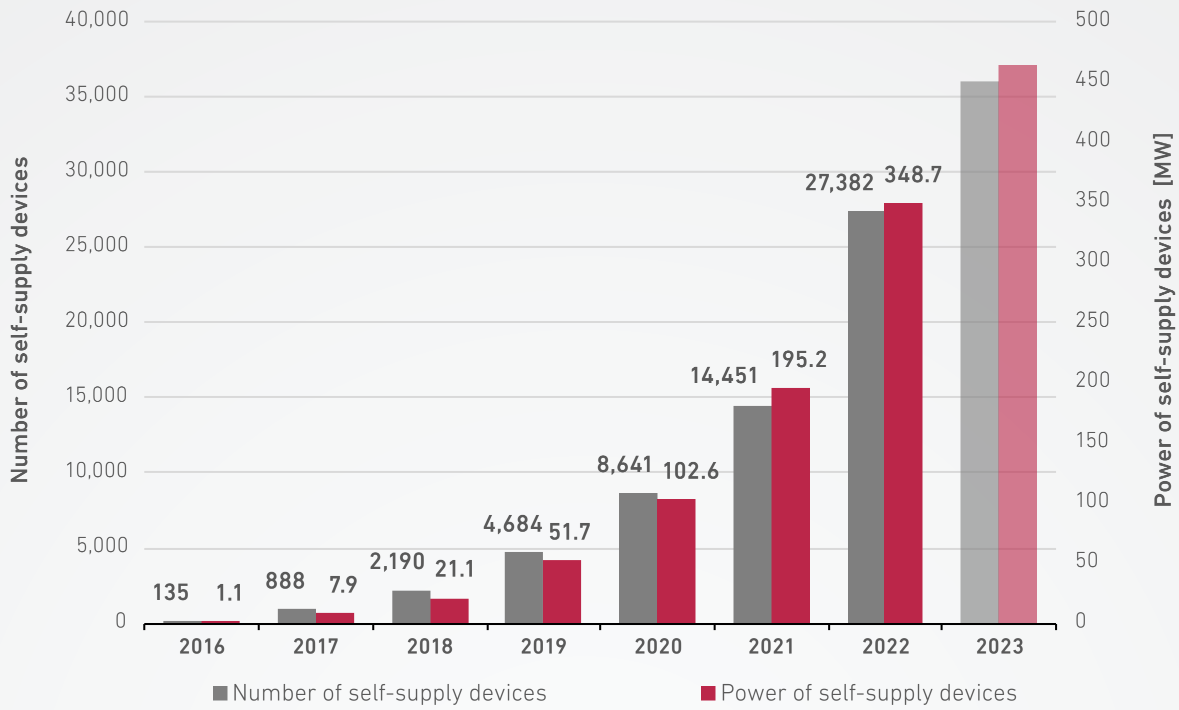
12,140 new self-supply installations with a connected capacity of 154 MW

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

In 2016, when self-supply installations began to be connected, only 135 self-supply installations with a total connection capacity of 1.1 MW were connected. In 2022, by contrast, 12,140 new installations were connected, with a total capacity of nearly 154 MW. In 2022, a total of 27,382 self-supply devices with a total installed capacity of 349 MW and an average installed capacity of 12.7 kW were thus in operation. As the number of self-supplying consumers grows, so does the average power of self-supply devices – in 2016, for instance, the average newly connected self-supply facility was rated at 8.1 kW. The increase in the power of self-supply devices can be attributed to the increasing use of electricity to heat buildings using heat pumps and the emerging interest in using self-supply measures to charge electric vehicles at home.

Based on data from the last seven years, the Energy Agency made an estimate of the increase in the number (using a second-degree polynomial) and total power of self-supply devices until 2023 (based on the average power of devices connected in 2022). Under such dynamics, almost 36,000 customers are expected to be self-sufficient in electricity, with the total power of the self-supply devices amounting to almost 465 MW by the end of 2023.

FIGURE 37: NUMBER AND INSTALLED CAPACITY OF SELF-SUPPLY DEVICES IN THE 2016–2022 PERIOD AND THE FORECAST UNTIL 2023



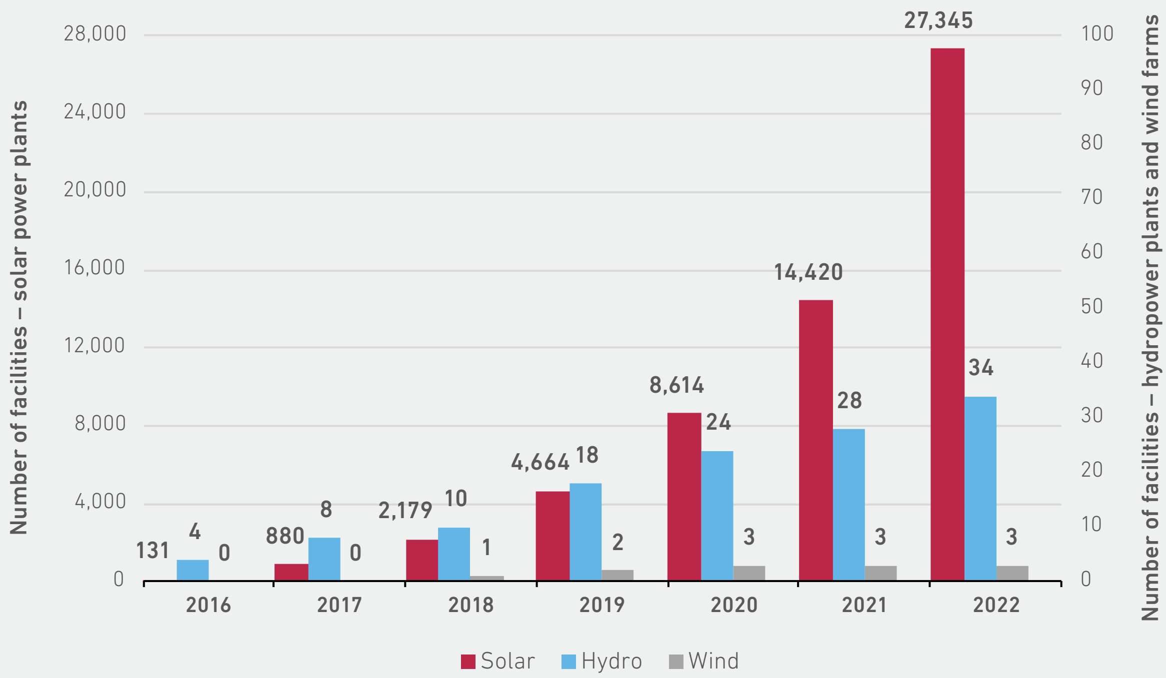
SOURCES: ENERGY AGENCY, SODO, ELECTRICITY DISTRIBUTION COMPANIES, BORZEN

According to the legislation, a self-supply device may produce electricity using solar, wind, hydro or geothermal energy, or it may be a CHP unit that uses RES as the primary source. In practice, solar power plants are overwhelmingly predominant (27,345 devices), while there are only 34 devices using hydropower and only three installations using wind power.

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

In the coming years, we expect an increase in the number of production facilities for community self-supply coming online. The first facility for community self-supply, with a rated power of 14 kW, was connected in 2019. In 2020, four such installations with a total connected capacity of 86 kW were connected. In 2021, 25 installations with a total connected capacity of 1100 kW were connected, while in 2022, 29 more installations with a total connected capacity of 2000 kW were connected. By the end of 2022, there were already 59 community self-supply facilities in operation, totalling 3200 kW.

FIGURE 38: NUMBER OF SELF-SUPPLY DEVICES IN 2016–2022 BY PRODUCTION SOURCE

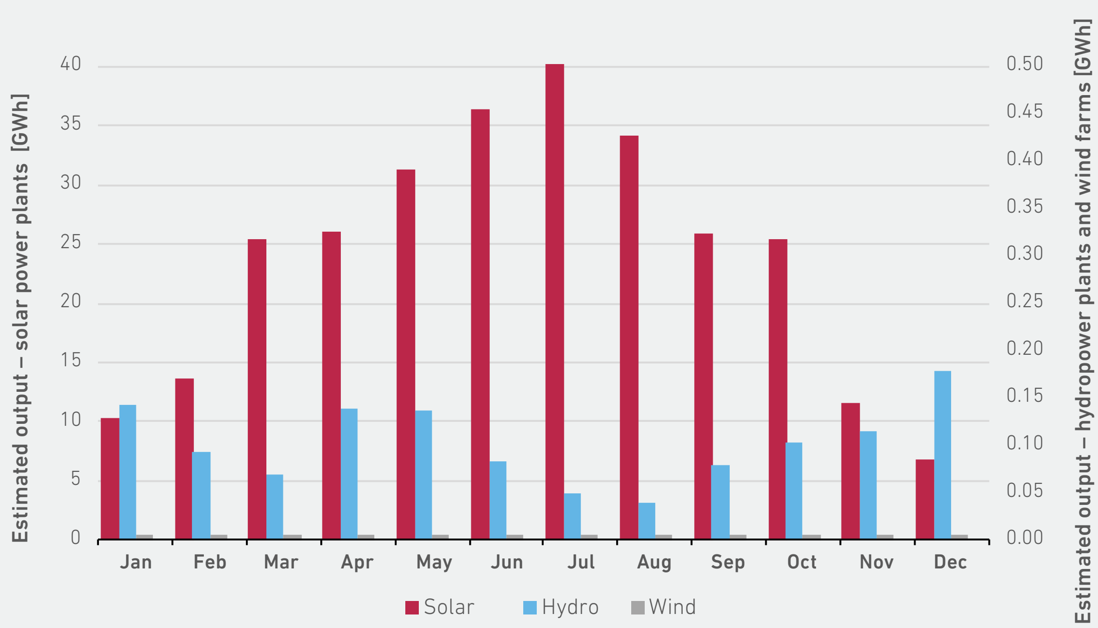


SOURCES: ENERGY AGENCY, SODO, EDC, BORZEN

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

As many as 99.8% of all self-supply devices are solar power plants, which means that the estimated electricity production depends heavily on the time of year and geographical and weather factors. In 2016, the estimated amount of electricity produced by self-supply devices was only 0.6 GWh, while in 2022 it was already at 288.3 GWh.

FIGURE 39: ESTIMATED OUTPUT OF SELF-SUPPLY DEVICES IN 2022 BY MONTH AND TECHNOLOGY



SOURCE: BORZEN

Cohesion Policy Measures

Within the Operational Programme for the Implementation of the EU Cohesion Policy 2014–2020, the Ministry of Infrastructure, under the specific objective – Increasing the share of renewable energy sources in end-use / final energy consumption – has already published a Call for Proposals for co-funding the construction of new small-scale solar electricity production facilities in 2021. EUR 67.6 million was available for co-financing the purchase and installation of solar electricity production facilities of up to 10 MW capacity. The total financial incentive amount per project was limited to 20% of the eligible costs of the investment, up to a maximum of EUR 200 per 1 kW of installed capacity of the production facility. There were several deadlines for the submission of projects to the Call for proposals, which closed at the beginning of 2023. A total of EUR 23.1 million was distributed among 321 projects.

At the end of 2022, the Ministry of Infrastructure, within the framework of the Recovery and Resilience Plan under the Green Transition, launched a Call for proposals for co-funding the energy renovation of publicly-owned multi-dwelling buildings with EUR 5 million in funds provisionally allocated and that will be open until the funds are used up.

Regulation of Network Activities

Unbundling of Activities

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

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

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

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

Technical Services by the Operators

Ancillary Services

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

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

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

Ancillary services are categorized into frequency services, which encompass FCP, aFRP and mFRP, and non-frequency services, which include voltage regulation and the provision of a black start. Frequency ancillary services belong among the 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. The FCP reserve is denoted by FCR, the aFRP reserve by aFRR and mFRP by mFRR. For 2022, ELES has planned the following reserve capacities for frequency ancillary services:

- FCR: ±15 MW,
- aFRR: +60 MW, –60 MW,
- mFRR: +250 MW, –71 MW.

The projected total volume of frequency ancillary services was the same in 2022 as in the previous two years. This is because the TSO complied with the provisions of the reserve sharing agreement in the SCB (Slovenia, Croatia, Bosnia and Herzegovina) control block. At the block level, ELES must provide mFCR at the level of the potential outage of the largest production and consumption unit. In the SCB block, these are outages of the Krško NPP and the Avče PSHPP in the pumping regime. The participating TSOs of the three countries each contribute their share of the reserve, which is calculated in accordance with the provisions of the control block operating agreement.

The introduction of daily auctions for the ancillary services of the automatic and manual frequency restoration process

In 2022, as in the previous year, there was full implementation of the frequency ancillary services of the provisions of Commission Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing (hereinafter: Regulation (EU) 2017/2195). These provisions mandate the leasing of services on the basis of market principles for the shortest possible leasing period, with aFRR and mFRR leases to be performed separately for the positive and negative balancing directions, and the leasing of balancing power to be separated from the purchase of balancing energy. In 2022, ELES chose the aFRP and mFRP providers locally through the Slovenian balancing platform, while the FCP providers were chosen through the international platform FCR Cooperation, which ELES has participated in since 2021.

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

TABLE 13: THE PRICE OF FCR AND THE SHARE OF FCR LEASED IN SLOVENIAN SINCE 2022

	Average price [EUR/MW/h]	Lease cost [EUR]	Share of FCR leased in Slovenia (%)
January	18.08	158,509.80	24.9%
February	20.38	186,744.25	20.3%
March	26.13	253,566.54	19.5%
April	22.58	196,374.69	16.8%
May	19.21	161,373.80	15.2%
June	17.94	84,407.25	12.6%
July	26.38	109,376.24	13.8%
August	32.94	112,989.51	8.7%
September	24.72	225,749.24	12.1%
October	32.67	362,447.69	24.7%
November	17.06	171,491.15	9.9%
December	19.92	194,026.98	12.4%
Total	**16.87**	**2,217,057.14**	**15.72%**

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

Table 13 shows the FCR costs by month. It likewise shows the share of Slovenian FCR requirements covered by Slovenian providers. The FCR prices were a lot more stable than the year before but also higher, on average. Hence, the total cost of providing this service increased by EUR 461,598.20. The share covered by Slovenian providers was even lower than in 2021, when it was 21.36%. There are several possible reasons for this. Certainly, in a period of very high energy prices, the providers preferred to dedicate their full capacity to participation in the energy market than to offer a service that, in the long term, due to the variance in the power output, also contributes to shortening the lifetime of certain components in the electricity production facilities.

In 2022, ELES managed the aFRP service providers for power (aFRR) and balancing energy separately. All providers with a valid certificate of technical competence for the provision of aFRP services were eligible to participate in the aFRR auctions. Each day, the selected aFRR providers had to provide an amount of energy corresponding to the balancing capacity assigned at the auction, while all providers with a valid certificate of technical competence for the provision of aFRP services could offer balancing energy up to the amount corresponding to the total recognised aFRR regulation capacity.

In line with the provisions of Regulation (EU) 2017/2195, ELES ceased to hold annual aFRR and mFRR auctions in 2022. Another important novelty is the introduction of daily auctions, which started on 1 February. With regards to aFRR, for the month of January, ELES thus conducted a monthly auction for each balancing direction for the total required volume of 60 MW. Beginning with February, it conducted monthly auctions for 36 MW of regulation capacity, with an additional 24 MW of regulation capacity secured at daily auctions. Unlike the previous year, no peak and off-peak products featured in 2022, with only base-load products traded. Only two bidders participated in the auctions throughout the year, one providing services with conventional production sources and the other with battery storage.

TABLE 14: AUCTION RESULTS FOR aFRR

Positive balancing direction (aFRR+)		
Monthly auction for January		
	Allocated volume [MW]	Price achieved [EUR/MW/h]
provider 1	29	7.99
provider 2	31	8.09
Monthly auction summary for the February–December period		
provider 1	18	7.99
provider 2	18	8.09
Daily auction summary for the February–December period		
provider 1	11	7.99
provider 2	13	8.09
Negative balancing direction (aFRR–)		
Monthly auction for January		
	Allocated volume [MW]	Price achieved [EUR/MW/h]
provider 1	28	7.65
provider 2	32	7.75
Monthly auction summary for the February–December period		
provider 1	17	7.65
provider 2	19	7.75
Daily auction summary for the February–December period		
provider 1	11	7.66
provider 2	13	7.75

SOURCE: ELES

In 2022, ELES managed the mFRP service providers for power (mFRR) and balancing energy separately. All providers with a valid certificate of technical competence for the provision of mFRP services were eligible to participate in the mFRR auctions. Each day, the selected mFRR providers had to provide an amount of energy corresponding to the balancing capacity assigned at the auction, while all providers with a valid certificate of technical competence for the provision of aFRP services could offer balancing energy up to the amount corresponding to the total recognised aFRR regulation capacity. ELES also has a five-year contract with one of the mFRR providers for the provision of 178 MW of this service until the end of 2023. This required ELES to lease, on an annual and monthly basis, a total of 72 MW of reserves in the positive direction for 2022, while for the negative direction, ELES had to lease the entirety of the required reserve in this way. Despite foreseeing a whole-year mFRR- requirement of 71 MW, ELES only leased this amount for January and February. In March, ELES decreased this volume to 51 MW and then further to 41 MW in April, a level that was then maintained through the rest of the year. As in the case of aFRR, daily auctions for mFRR were introduced in February. Unlike aFRR, however, beginning with that month, the monthly auctions for mFRR were completely abolished, with providers henceforth selected in daily auctions only. The auctions for both mFRR+ and mFRR- had four participants each, but not the same ones. Auction participants offered reserve capacity from conventional production facilities and distributed sources, as well as battery storage and through demand response. The auction results are shown in 15.

TABLE 15: AUCTION RESULTS FOR mFRR

Positive balancing direction (mFRR+)		
Five-year product		
	Already allocated volume [MW]	Price achieved [EUR/MW/h]
provider	178	6.22
Monthly auction for January		
	Allocated volume [MW]	Price achieved [EUR/MW/h]
provider 1	67	2.89
provider 2	5	2.78
Daily auction summary for the February–December period		
provider 1	14.50	3.04
provider 2	36.47	2.83
provider 3	5.34	2.90
provider 4	6.95	2.80
Negative balancing direction (mFRR–)		
Monthly auction for January		
	Allocated volume [MW]	Price achieved [EUR/MW/h]
provider 2	44	3.97
provider 5	27	4.24
Daily auction summary for February		
provider 2	42	4.18
provider 3	4	4.14
provider 5	25	4.31
Daily auction summary for March		
provider 2	34	4.18
provider 3	3	4.15
provider 5	14	4.31
Daily auction summary for the April–December period		
provider 2	24.08	4.05
provider 3	4.63	3.99
provider 5	12.29	4.24

SOURCE: ELES

ELES did not have a special selection process for non-frequency ancillary service providers in 2022. At the end of 2021, it added annexes to existing contracts for the provision of voltage and reactive power control and black start ancillary services for 2022.

Table 16 shows the total costs of individual ancillary services for 2022. Note that only the costs funded from the network charge for the transmission system are shown. These are the costs of all non-frequency ancillary services and the costs of leasing reserves for frequency ancillary services. It needs pointing out that energy activation costs for frequency ancillary services are funded from the imbalance settlement, the costs of which are covered by the balance-responsible parties.

The total costs of the ancillary services in 2022 were higher than in 2021 by about EUR 632,624, but still lower by about EUR 5 million than in 2020. They were higher for all items except for negative mFRP, where they decreased significantly. This was mainly due to the reduction in the required reserve for this service, which was two times lower, as described above. The increased cost of other ancillary services was largely due to developments in the European energy market.

TABLE 16: COSTS OF ANCILLARY SERVICES IN 2022 FUNDED BY THE NETWORK CHARGE

Ancillary service	Annual cost not including VAT [EUR]
FCP	2.374.468
Positive aFRP	4.527.926
Negative aFRP	4.337.560
Positive mFRP	11.622.252
Negative mFRP	1.040.930
Voltage and reactive power control	4.827.245
Provision of a black start	1.298.154
Total	**30.028.535**

SOURCE: ELES

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 chargeable interval of 15 minutes.

A marked increase in energy imbalance costs

The Slovenian power exchange index (SIPX) is used to calculate the basic prices of C_{pos} and C_{neg} imbalances, and therefore also the derived prices of C'_{pos} and C'_{neg} imbalances. In 2022, the average monthly value of the SIPX was 273.72 EUR/MWh, which is 159.12 EUR/MWh or 138.85% more than in the previous year. The SIPX reached its highest value (879.29 EUR/MWh) on 22 August in the 21st hour and its lowest (0 EUR/MWh) on 14 April in the 15th hour.

In 2022, the average derived price for negative imbalances C'_{neg} (the short position of the balance-responsible party) was 307.16 EUR/MWh, while the price for positive imbalances C'_{pos} (the long position of the balance-responsible party) was 214.23 EUR/MWh. In this period, the highest price of C'_{neg} was 1,148.27 EUR/MWh, and the highest price of C'_{pos} was 879.29 EUR/MWh. In the same period, the lowest price of C'_{neg} was 0 EUR/MWh, and the lowest price of C'_{pos} was –431.42 EUR/MWh. Table 17 shows the imbalance prices and the SIPX index in 2022 and 2021. An extraordinary increase in all prices is noticeable – a consequence, of course, of the energy crisis, which had been on-going since the second half of 2021 and was further exacerbated by the outbreak of the war in Ukraine in February 2022.

TABLE 17: AVERAGE, MAXIMUM AND MINIMUM VALUES OF C'_{NEG}, C'_{POS} AND THE SIPX IN 2021 AND 2022

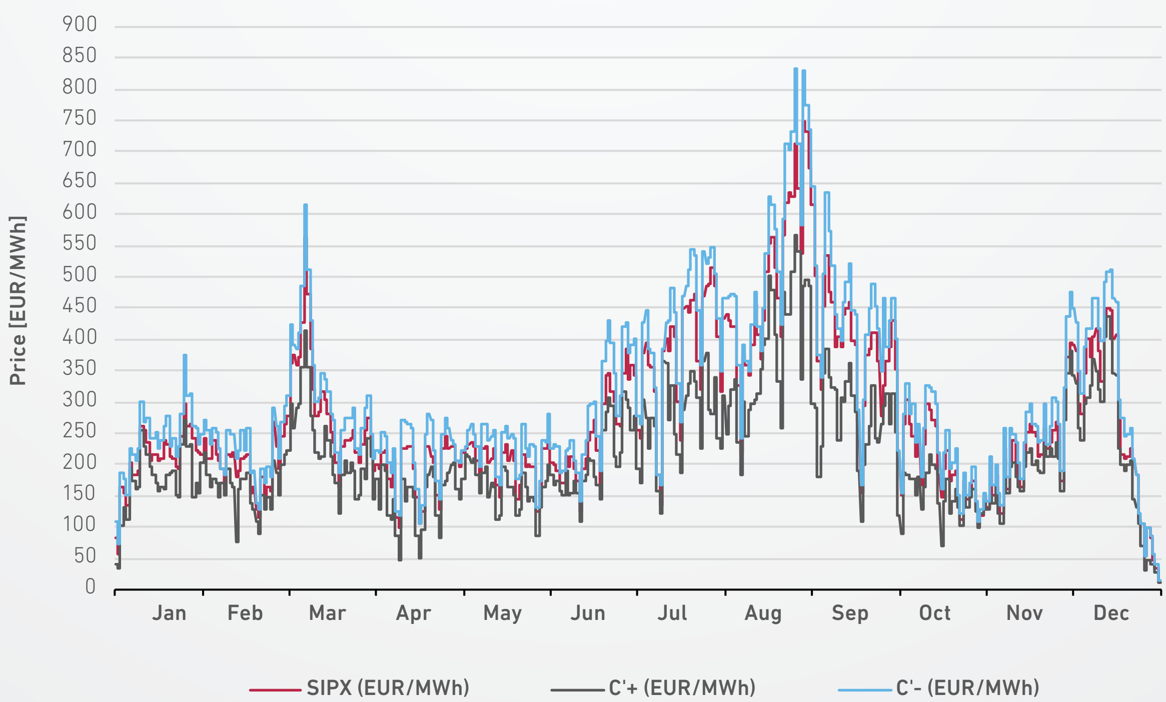
	2022 [EUR/MWh]			2021 [EUR/MWh]		
	C'_{neg}	C'_{poz}	SIPX	C'_{neg}	C'_{poz}	SIPX
Average	307.16	214.23	274.46	135.49	86.47	115.04
Maximum	1.148.27	879.29	879.29	724.86	533.19	533.19
Minimum	0.00	–431.42	0.00	–41.72*	–70.94	–66.18

* The Report on the Energy Situation in Slovenia in 2021 gives an incorrect value of –70.94 EUR/MWh

SOURCE: BORZEN

Figure 40 shows the trends in the derived imbalance prices of C'_{pos} and C'_{neg} and the Slovenian power exchange price index (SIPX) in 2022. Due to the copious amounts of 15-minute data, the graph uses the daily averages of SIPX, C'_{pos} and C'_{neg}, so the extremes of individual prices are not visible on the graph.

FIGURE 40: AVERAGE DAILY VALUES OF THE BASIC IMBALANCE PRICES C'_{POS} AND C'_{NEG} AND THE SIPX INDEX

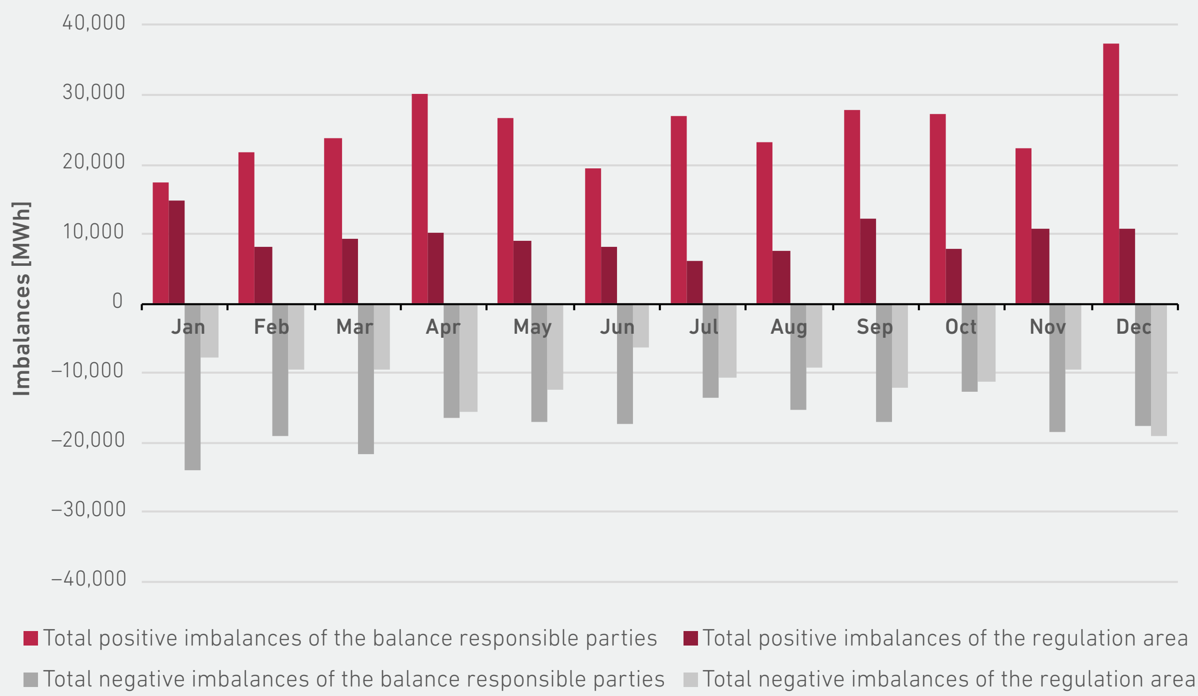


SOURCE: BORZEN

The diagram in Figure 40 clearly shows three sharp price increases. The first occurred immediately after the outbreak of the war in Ukraine at the end of February, the second at the end of the summer, when market participants began to anticipate with concern the uncertain natural gas supply situation in the coming winter, and the third, less pronounced, occurred at the actual onset of the cold winter days in the last third of November, lasting until the start of the Christmas holidays. The prices settled down in October and November, mainly due to the adoption of Council Regulation (EU) 2022/1854 of 6 October 2022 on an emergency intervention to address high energy prices, along with the measures taken by individual Member States on the basis of the provisions of this Regulation. The average monthly prices of the negative energy imbalances C'_{neg} ranged from 215.38 EUR/MWh in April to 538.37 EUR/MWh in August, while the prices of the positive imbalances C'_{pos} ranged from 145.83 EUR/MWh in April to 372.93 EUR/MWh in August. The greatest difference between C'_{neg} and C'_{pos} was 165.44 EUR/MWh, recorded in August, and the lowest was 50.14 EUR/MWh in March. The average difference between C'_{neg} and C'_{pos} in 2022 was 92.72 EUR/MWh, or almost twice what it was in the previous year, which was 48.86 EUR/MWh.

Figure 41 shows the total positive and negative imbalances of all the balance-responsible parties in Slovenia in 2022, as well as the total imbalances of the Slovenian regulation area.

FIGURE 41: TOTAL IMBALANCES IN THE SLOVENIAN ELECTRICITY SYSTEM IN 2022



SOURCES: BORZEN, ELES

The highest positive imbalances of the balance-responsible parties were recorded in December and the highest negative ones in January. The total positive annual imbalances of the regulation area amounted to 114,662 MWh, and the negative to −132,877 MWh. At the same time, the total positive annual imbalances of all the balance-responsible parties amounted to 304,004 MWh, and the negative to −210,779 MWh. Compared to the previous year, the total positive and negative imbalances in the regulation area, as well as the total positive imbalances of the balance-responsible parties, increased in 2022. The total negative imbalances of the balance-responsible parties, on the other hand, decreased somewhat. The trends in imbalances over the last five years are shown in Table 18; it should be noted that all imbalances are treated in accordance with the new Rules on the Operation of the Electricity Market.

TABLE 18: TRENDS IN THE TOTAL IMBALANCES OF THE BALANCE-RESPONSIBLE PARTIES AND THE REGULATION AREA IN SLOVENIA IN THE 2018–2022 PERIOD

	2018	2019	2020	2021	2022
Total positive imbalances of balance-responsible parties [MWh]	251,711	278,713	245,421	245,997	304,004
Total positive imbalances of the regulation area [MWh]	87,206	98,471	90,606	109,557	114,662
Total negative imbalances of balance-responsible parties [MWh]	168,692	152,982	177,414	236,796	210,779
Total negative imbalances of the regulation area [MWh]	83,750	57,541	53,215	83,639	132,877

SOURCES: BORZEN, ELES

As in all the previous years, the system and the balance-responsible parties deviated more in the positive than in the negative direction. The main reason for this is probably the imbalance settlement methodology used in Slovenia, which is based on two prices, between which there is normally a significant difference. This fact encourages traders to secure energy surpluses rather than deficits, as this reduces their risks in the market. The large share of positive imbalances can also partially be attributed to an increasing share of unpredictable generation from renewable sources. Imbalances at the level of the balance-responsible parties are larger than those at the level of the regulation area, since the balance-responsible parties often deviate in opposite directions and thus partially cancel out.

Quality of Supply

At the system level, the regulation of the quality of supply aims to improve or maintain the existing level at optimised costs. Various activities are carried out to address the quality of supply, such as monitoring, reporting and analysing data on the following observed dimensions: continuity of supply, commercial quality, and voltage quality. In addition, the Energy Agency performs quality of supply regulation by publishing data and analyses in its report on the quality of supply[35].

In 2022, the Energy Agency carried out an audit of the data on the continuity of supply reported by one of the distribution companies for the 2021 financial year and identified considerable progress in the area of reporting as stipulated in the Legal Act on the Rules for Monitoring the Quality of Electricity Supply. As part of the audit process, the Energy Agency also assessed the effectiveness of the process of monitoring the continuity of supply; notwithstanding certain shortcomings, the company's processes were assessed as sufficient for the purpose of monitoring the continuity of supply.

Continuity of Supply

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

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

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

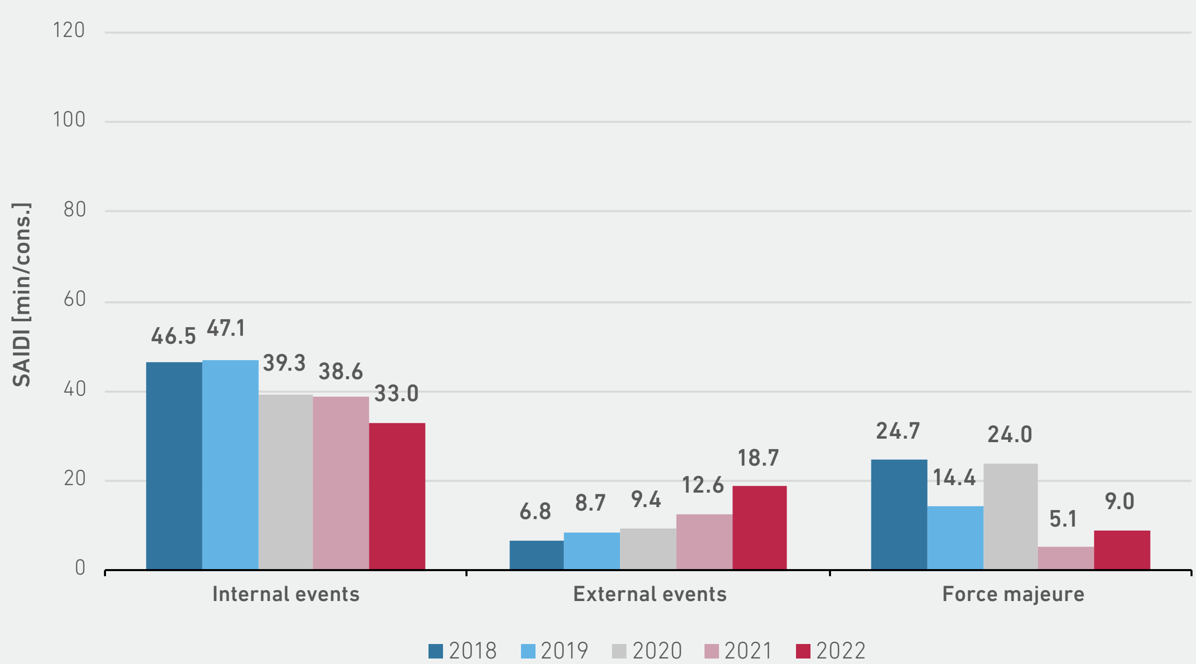
35 The annual reports on the quality of supply are available on the Energy Agency's website.

Based on the data on the SAIDI and SAIFI indicators, calculated at the level of individual distribution companies, the Energy Agency calculated the aggregate value of these indicators considering the number of all the consumers in Slovenia. The monitoring of the SAIDI and SAIFI parameters over the observation period has identified a gradual improvement in the level of quality of supply. In 2022, the electricity supply to each customer was interrupted 2.25 times on average for an average duration of 154.2 minutes.

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, with the improvement in 2021 followed by another decline in 2022.

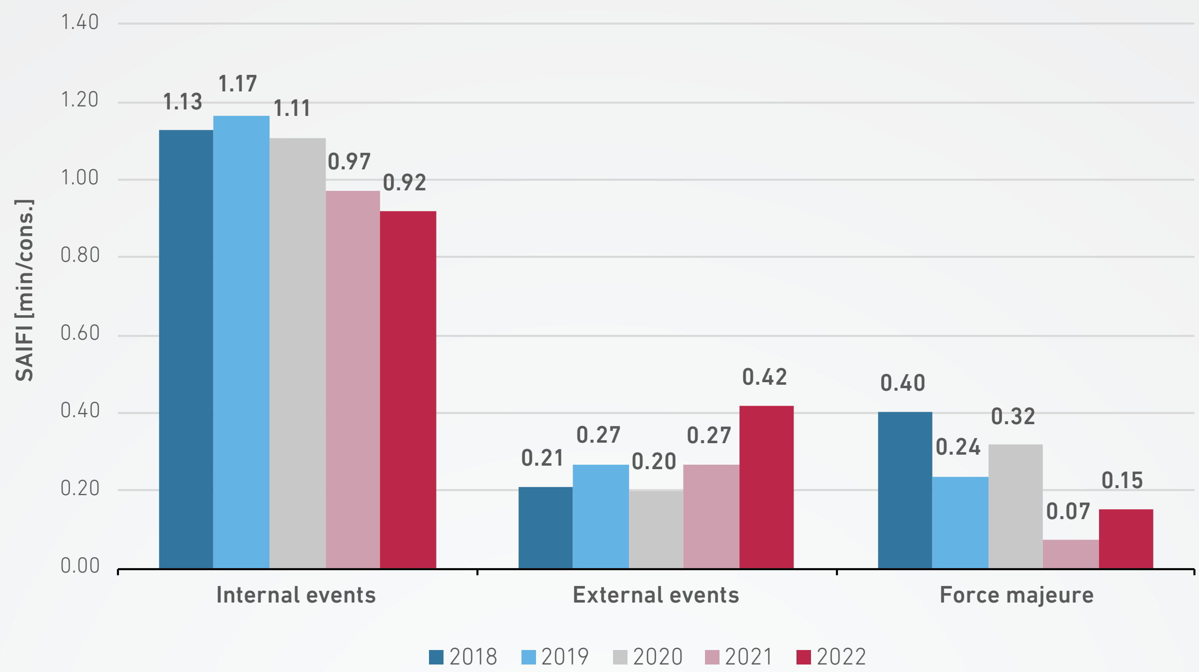
Figures 42 and 43 show the SAIDI in SAIFI indicators for unplanned long-term interruptions, classified by causes of interruption (internal and external events, and force majeure), for the 2018–2022 period, while Figure 44 shows the MAIFI indicator for the same observed period. All the indicators are calculated at the national level.

FIGURE 42: SAIDI FOR UNPLANNED LONG-TERM INTERRUPTIONS, CLASSIFIED BY CAUSES, IN THE 2018–2022 PERIOD



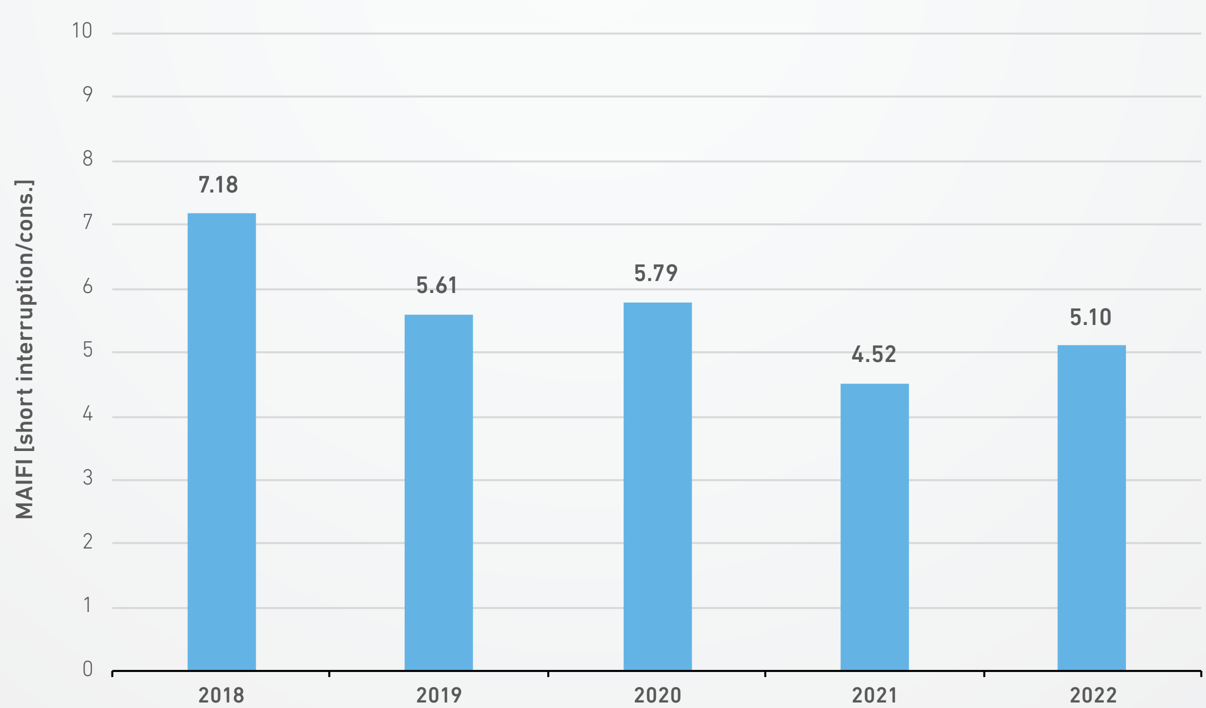
SOURCE: ENERGY AGENCY

FIGURE 43: SAIFI FOR UNPLANNED LONG-TERM INTERRUPTIONS, CLASSIFIED BY CAUSES, IN THE 2018–2022 PERIOD



SOURCE: ENERGY AGENCY

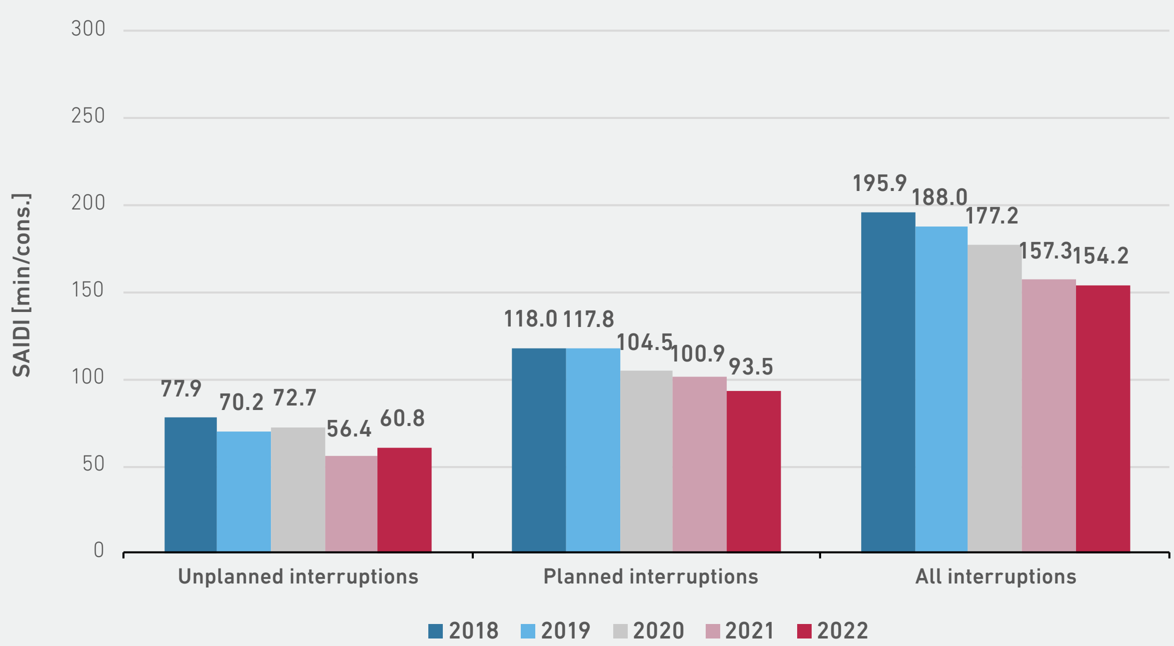
FIGURE 44: MAIFI IN THE 2018–2022 PERIOD



SOURCE: ENERGY AGENCY

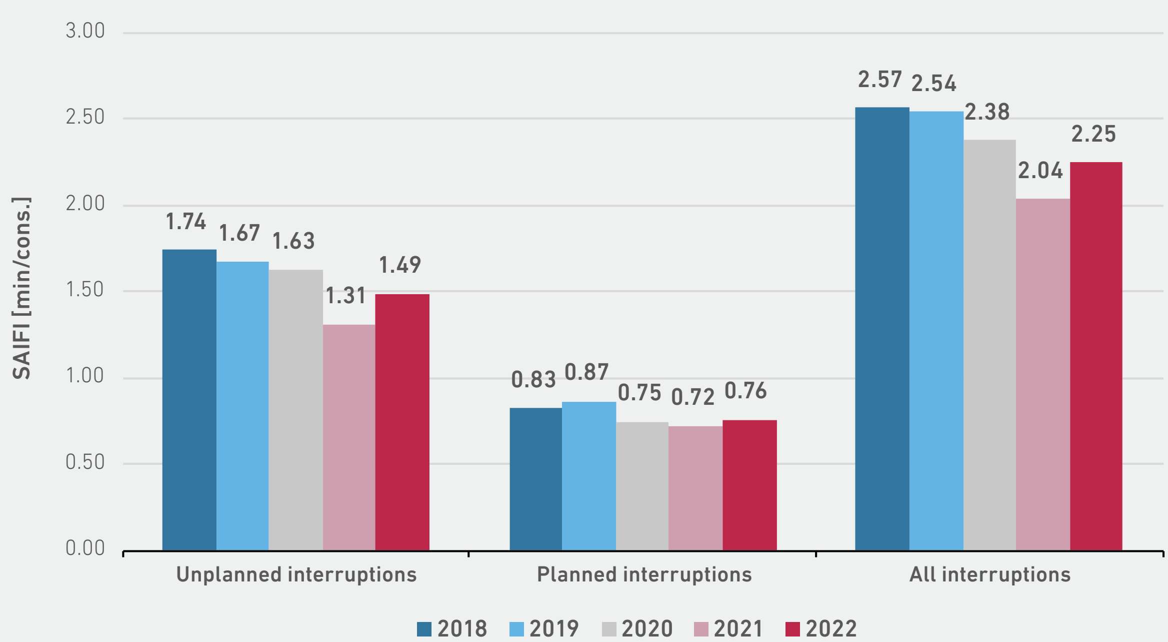
Figures 45 and 46 show the aggregate value for the SAIDI and SAIFI indicators for unplanned, planned, and all interruptions in Slovenia in the 2018–2022 period.

FIGURE 45: SAIDI FOR ALL LONG-TERM INTERRUPTIONS, CLASSIFIED BY CAUSES, IN THE 2018–2022 PERIOD



SOURCE: ENERGY AGENCY

FIGURE 46: SAIFI FOR ALL LONG-TERM INTERRUPTIONS, CLASSIFIED BY CAUSES, IN THE 2018–2022 PERIOD



SOURCE: ENERGY AGENCY

In 2022, the Energy Agency also continued to monitor the data on supply continuity in the CDSs. This year, the CDSs did not receive any complaints from consumers with regard to the continuity of supply; however, they did record electricity supply interruptions, as shown in Table 19. The relatively small number of recorded outages is a consequence of the methodology employed to monitor electricity supply continuity, in which only outages at the medium voltage feeder level are recorded.

TABLE 19: OVERVIEW OF THE NUMBER OF INTERRUPTIONS IN CDSS, CLASSIFIED BY CAUSES IN 2022

Number of electricity supply interruptions in 2022	Petrol Ravne CDS	Petrol Štore CDS	Jesenice CDS	Sij Acroni CDS	Talum CDS	Salonit CDS
Unplanned interruptions	**0**	**0**	**0**	**1**	**0**	**0**
• internal events	0	0	0	4	0	1
• external events	0	0	0	0	0	0
• force majeure	0	0	0	0	0	0
Planned interruptions	**10**	**1**	**0**	**0**	**0**	**9**
Short-term interruptions	**0**	**0**	**0**	**0**	**0**	**1**

SOURCES: CDSs

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.

The level of commercial quality of services in the area of connection-related services remains unsatisfactory, with connection approvals for self-supply devices taking too long to issue.

In 2022, no compensation for a breach of guaranteed standards was paid. Based on the three-year trend of commercial quality parameters, we conclude that the level of commercial quality has generally remained steady; by contrast, there has been a decrease in quality in the area of connection-related services. In most areas of the distribution system, the time taken to issue a connection approval has increased beyond the minimum standard requirements, largely due to difficulties in connecting self-supply devices.

Table 20 shows the ranges (minimum and maximum values) of the commercial quality parameters in the 2020–2022 period.

TABLE 20: RANGE OF THE COMMERCIAL QUALITY INDICATORS IN THE 2020–2022 PERIOD

Commercial quality parameters	2020		2021		2022	
	Min.	Max.	Min.	Max.	Min.	Max.
Connection-related services						
Average time to issue an approval for connection [days]	8.3	24.6	10.4	47.9	18.2	36.7
Average time to issue a cost estimate or proforma invoice for simple works [days]	3.1	5.2	2.8	7.9	2.8	7.7
Average time to issue a contract for connection to the LV system [days]	2.7	10.8	2.0	14.2	4.3	22.6
Average time to activate a connection to the system [days]	0.6	7.8	1.6	5.9	1.7	7.3
Customer service						
Average response time to consumers' written questions, complaints, or enquiries [days]	2.0	4.3	1.3	3.3	1.7	3.8
Average hold time in the call centre [s]	12.0	92.1	13.0	93.7	5.0	87.9
Call centre performance indicator [%]	89.0	93.8	88.0	94.0	83.0	94.5
Technical services						
Average time to restore the supply following a failure of a current limiting device (06:00–22:00)	0.9	1.7	0.8	2.2	1.1	2.2
Average time to restore the supply following a failure of a current limiting device (22:00–06:00)	0.8	2.4	1.2	6.1	1.0	2.0
Average response time to voltage quality complaints [days]	13.7	18.8	14.4	31.9	14.1	25.1
Average time to resolve voltage quality inconsistencies [months]	1.1	35.6	0.3	41.8	0.0	29.3
Metering and billing						
Average time to remedy meter failures [days]	3.3	9.6	3.3	9.6	1.4	5.6
Average time to restore supply following disconnection due to non-payment [h]	0.1	9.1	0.1	9.2	0.1	6.3

SOURCE: ENERGY AGENCY

In relation to commercial quality, data on consumer complaints is also collected through a standardised procedure. 2022 saw a significant increase in the total number of complaints, most often due to delays in issuing a connection approval, which in most cases were found to be justified and were associated with connecting self-supply devices and exceeding the maximum time to resolve voltage quality deviations. Both of these had already represented the most frequent grounds for complaints in the past.

There have also been many more largely unjustified complaints about delays in repairing a meter malfunction.

The share of justified complaints due to a delay in issuing a connection approval is mostly associated with the connection of self-supply devices

The increasing share of justified complaints due to a delay in issuing a connection approval is mainly linked to the pressing issue of connecting self-supply devices. The data on commercial quality complaints for the 2020–2022 period is summarised in Table 21.

TABLE 21: NUMBER AND SHARES OF JUSTIFIED COMMERCIAL QUALITY COMPLAINTS IN THE 2020–2022 PERIOD

Reason for complaint	Total number of complaints			Number of justified complaints			Share of justified complaints		
	2020	2021	2022	2020	2021	2022	2020	2021	2022
Connection activations									
Exceeding the time to activate the connection to the system	0	1	1	0	0	1	-	0%	100%
Inadvertent disconnection due to an error by the maintenance crew	1	4	0	1	4	0	100%	100%	-
Quality of supply									
Exceeding the maximum time to resolve voltage quality deviations	4	15	22	3	3	11	75%	20%	50%
Exceeding the time limit to respond to a voltage quality complaint	7	0	4	6	0	3	86%	-	75%
Exceeding the maximum permitted duration and number of unplanned long-term interruptions (only applies to final consumers on the MV system)	2	0	0	0	0	0	0%	-	-
Metering									
Delay in repairing a meter malfunction	1	1	86	0	1	3	0%	100%	3.5%
Billing, invoicing and debt collection									
Delay in responding to consumers' written questions, complaints or enquiries	1	2	25	1	2	8	100%	100%	32%
Connection-related services									
Delay in issuing a connection approval	0	14	50	0	8	40	-	57%	80%
Consumer services									
Failure to notify consumers about a planned interruption in time	2	7	5	0	6	0	0%	86%	0%
TOTAL	**18**	**44**	**193**	**11**	**24**	**66**	**61%**	**55%**	**32.7%**

SOURCE: ENERGY AGENCY

In 2022, the CDSs continued to monitor commercial quality. Due to greater system rigidity and a relatively low number of consumers, the CDSs did not receive any consumer complaints relating to commercial quality.

Voltage Quality

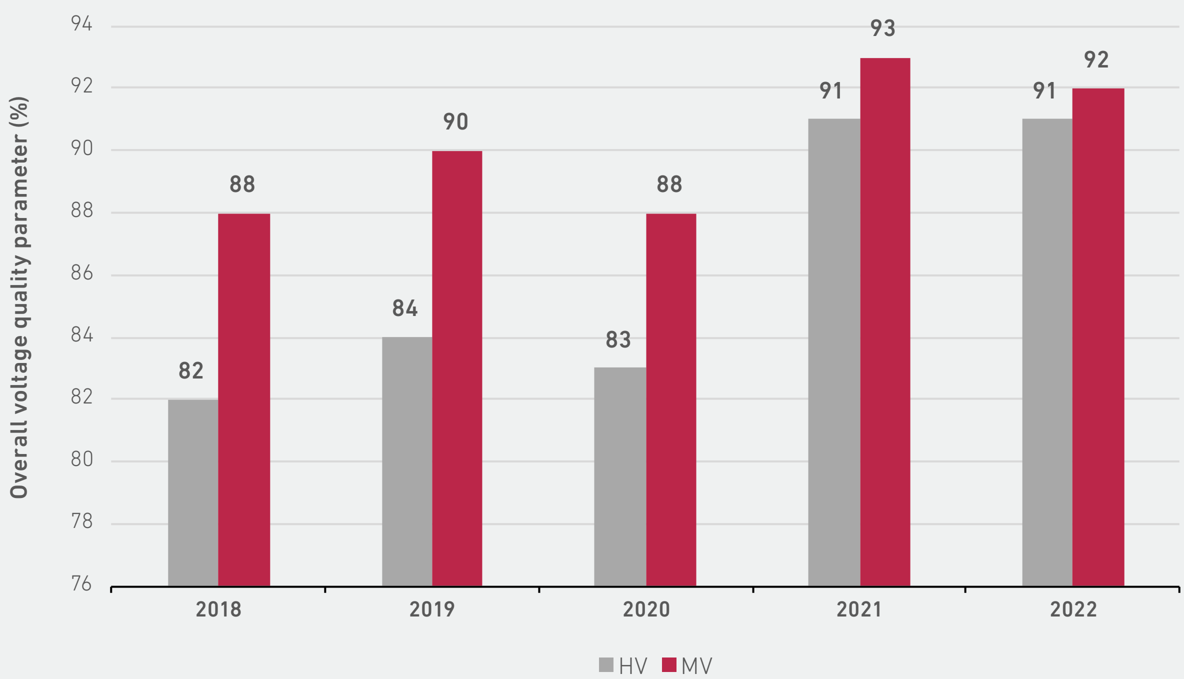
The two system operators and the distribution companies are required to perform regular monitoring at the border of the transmission and distribution networks, and at delivery points for larger users. In addition, occasional monitoring is carried out according to a predefined plan. When addressing a 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 a new consumer is connected.

The number of complaints regarding voltage quality, which had been sharply increasing for several years, has now slowed down.

On the basis of continuous voltage quality monitoring, an overall voltage quality parameter is calculated, reflecting the proportion of weeks in a calendar year during which the voltage quality parameters were in compliance with the requirements of the technical standard.

Figure 47 shows the overall voltage quality parameter as derived from supply voltage deviations, harmonics and flicker for the HV and MV levels of the distribution system over the 2018–2022 period.

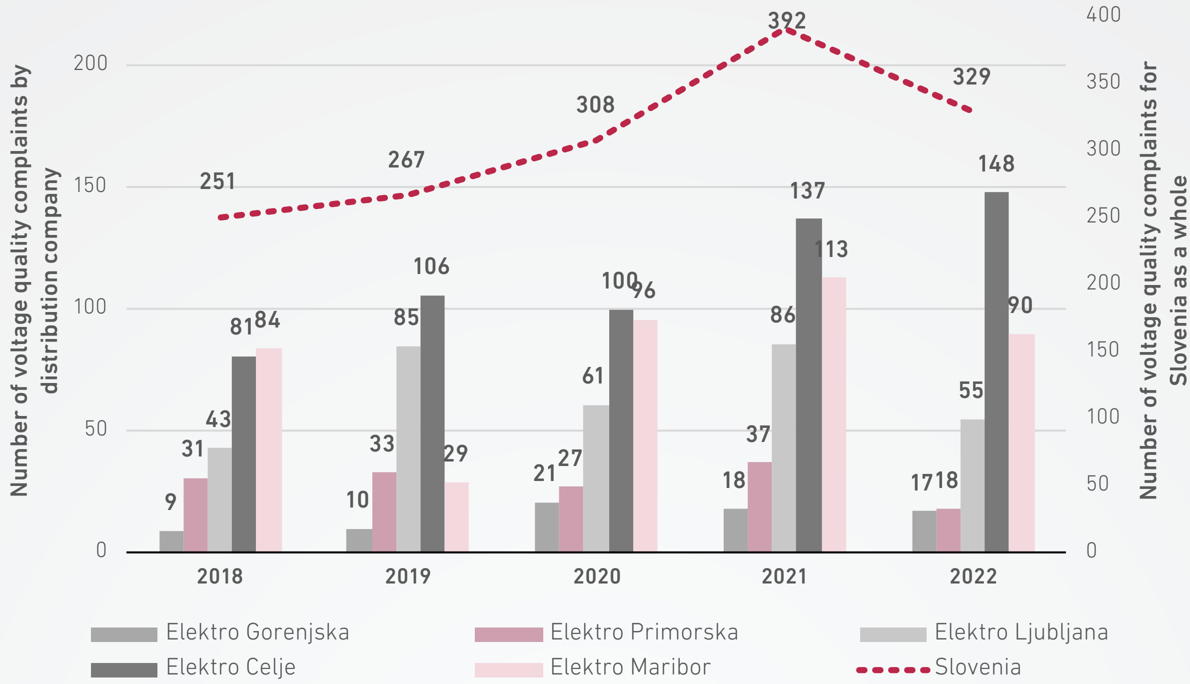
FIGURE 47: THE OVERALL VOLTAGE QUALITY PARAMETER BY INDIVIDUAL VOLTAGE LEVEL IN THE DISTRIBUTION SYSTEM OVER THE 2018–2022 PERIOD



SOURCE: ENERGY AGENCY

Figure 48 shows the trend in voltage quality complaints for individual distribution companies and for the entire territory of Slovenia. In recent years, the total number of complaints has been rising increasingly steeply, which could be a confirmation of the growing difficulties in operating the distribution network due to the accelerated connection of new consumers with devices such as self-supply facilities and heat pumps.

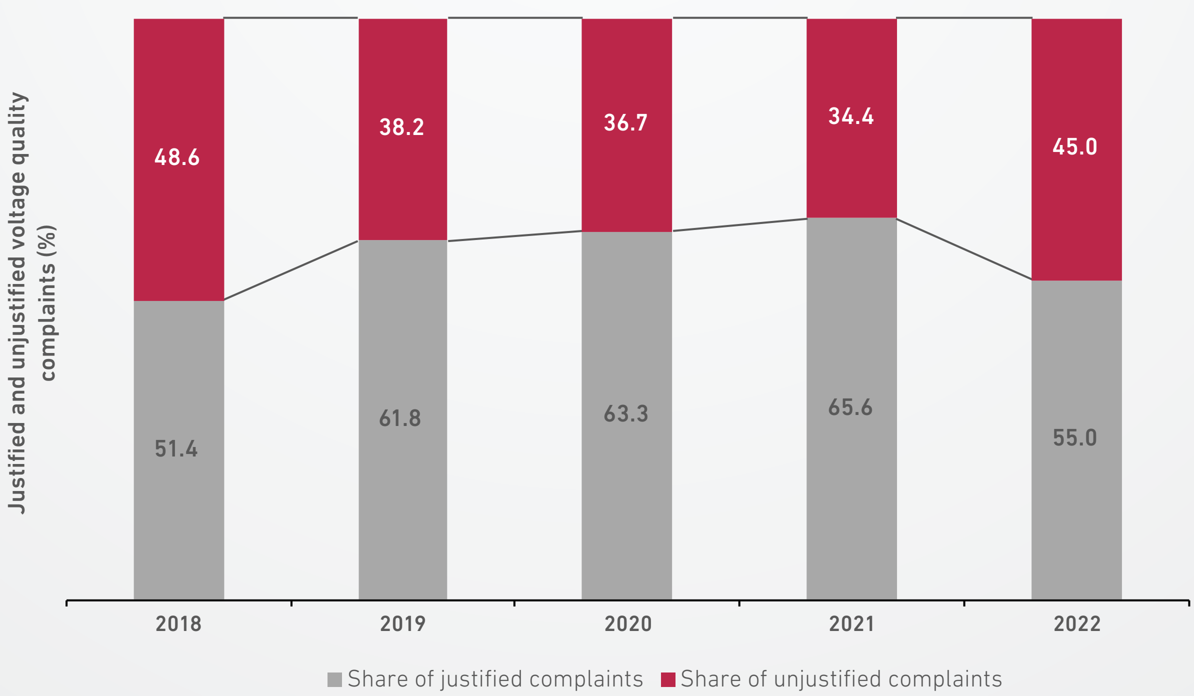
FIGURE 48: NUMBER OF VOLTAGE QUALITY COMPLAINTS BY DISTRIBUTION COMPANY AND IN SLOVENIA IN GENERAL IN THE 2018–2022 PERIOD



SOURCE: ENERGY AGENCY

In 2022, despite the slight deterioration of the overall voltage quality parameter, the total number of voltage quality complaints decreased. The number of justified complaints likewise decreased, as is evident in Figure 49.

FIGURE 49: SHARE OF JUSTIFIED AND UNJUSTIFIED VOLTAGE QUALITY COMPLAINTS IN THE 2018–2022 PERIOD



SOURCE: ENERGY AGENCY

ELES carried out continuous monitoring of the voltage quality in the high-voltage network at 204 connection points between the distribution system, producers and direct consumers. As in previous years, there have been repeated breaches of the standards due to the occurrence of flicker. Non-compliance of flicker with the standard was found at 95 measuring points, with an average out-of-compliance period of 10.9 weeks per non-compliant measuring point. No other breaches of voltage quality compliance were observed in the transmission system.

In 2022, voltage quality monitoring according to the standard was also conducted by the CDSs. The values were found to be beyond the limits of the standard due to flicker for most of the year at the 35 kV voltage level in CDS Štore, which is beyond the control of the CDS operator. The CDS operators did not receive any complaints in the area of voltage quality monitoring, however.

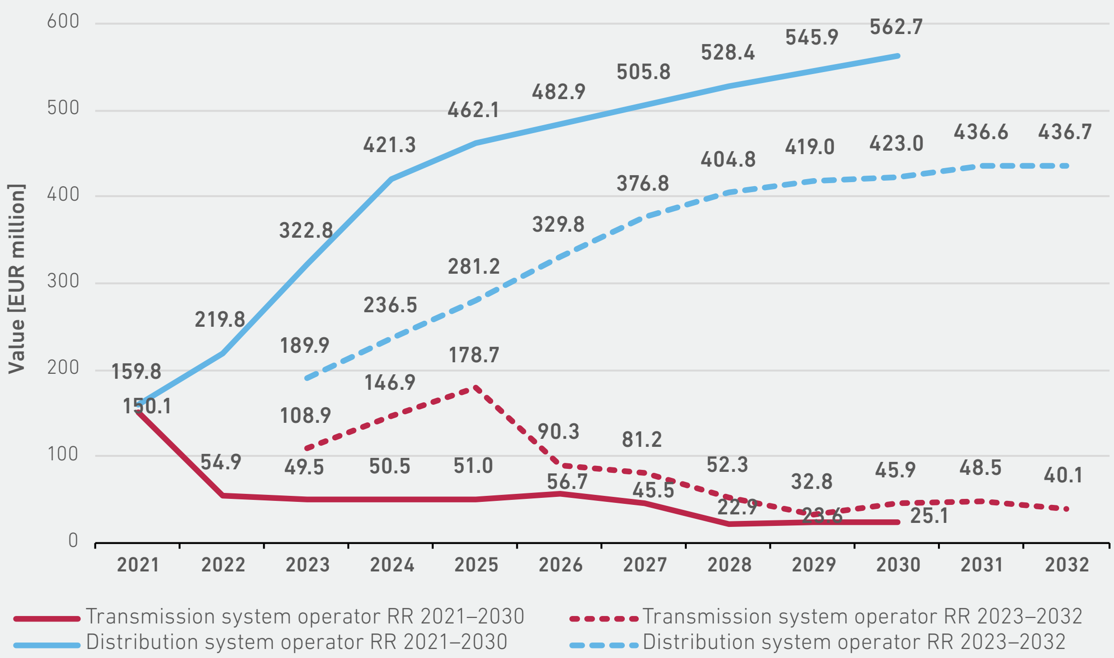
Multi-Year Development of the Electricity Network

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

Planning in the transmission system operator's development plan starts with an analysis of the transmission system conditions. The development plan must include an analysis of consumption coverage with the existing production sources and the sufficiency of these sources, as well as an assessment of the necessary transmission capacity to determine the time dynamics of planned investments and to evaluate them financially.

The DSO's development plan must include an analysis of the period covered by the previous development plan, an analysis of the electricity and electric power consumption forecast, and a country-wide distribution infrastructure investment plan, which must also be financially evaluated. In their development plans for the 2021–2030 period, the electricity system operators take into account, inter alia, the various scenarios for a transition to a low-carbon society as set out in the NECP and the related investments in the electricity infrastructure, valued at EUR 590 million by the transmission system operator and at over EUR 4.2 billion over the ten-year development plan period by the distribution system operator.

FIGURE 50: ASSESSMENT OF INVESTMENT RISKS FROM THE DEVELOPMENT PLANS PREPARED BY THE ELECTRICITY SYSTEM OPERATORS FOR THE 2021–2032 PERIOD

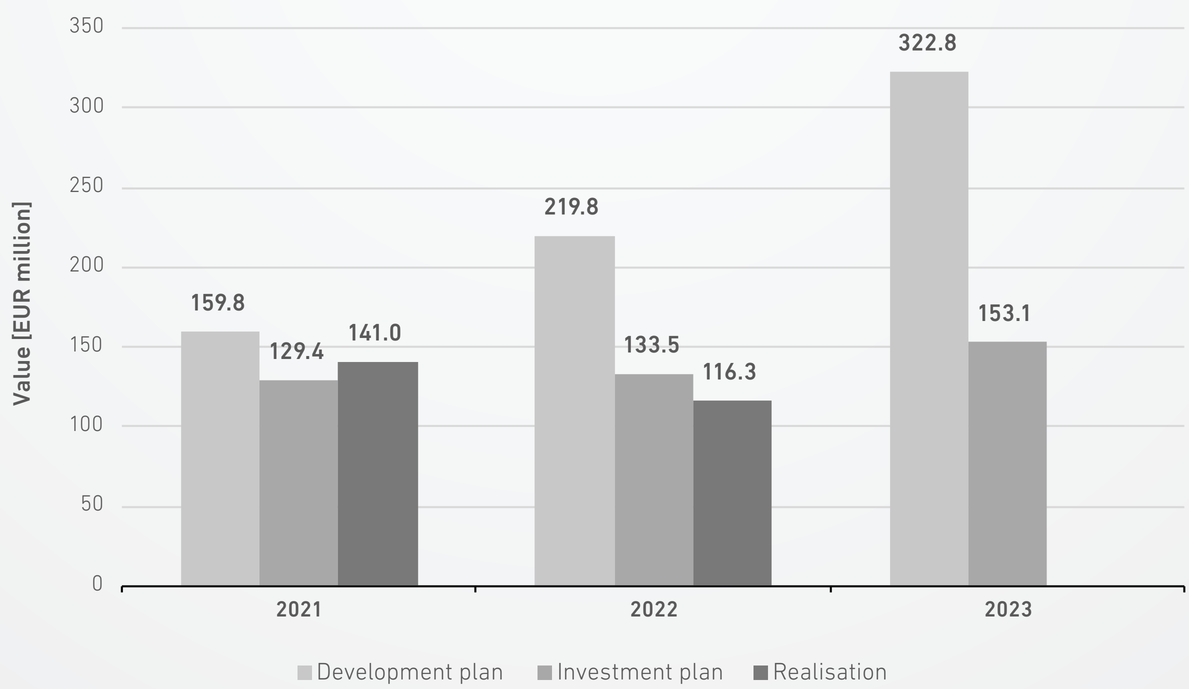


SOURCES: ELES, SODO

With the entry into force of the ESA, the authority to approve electricity system operators' development plans was transferred from the Minister responsible for energy to the Agency, which in early 2022, issued the Legal Act on the Methodology for the preparation of development plans of the electricity system operators. The Act encompasses the requirements of the national and European legislation related to the development of electricity networks. At the end of 2022, the Agency received both of the electricity system operators' development plans for the 2023–2032 period and issued approvals to both at the beginning of 2023. Compared to the distribution system operator's previous development plan, which had been formulated on the basis of the targets set out in the NECP, the plan for 2023–2032 shows a significant reduction in investments in the distribution infrastructure. The distribution system operator justifies this on the basis of improvements in input data and taking into account the implementation of flexibility as an alternative to grid reinforcements. However, the transmission system operator's development plan for the 2023–2032 period does show a significant increase in the value of investments in the years up to 2028 compared to the previous development plan – a result of the implementation of the GreenSwitch smart grid project, which the transmission system operator has developed together with the transmission system operators of Austria and Croatia.

That said, in light of the reduced value of investments in the 2023–2032 development plan, the question arises as to whether the distribution system operator and the owners of the distribution network will be able to realise the planned investments. In the investment plans submitted for the 2021–2023 period, the planned investment funds are significantly lower than those proposed in the development plan. In fact, the discrepancy between the resources needed to realise the development and investment plan and the available resources has been increasing over the years. While investment realisation in 2021 at least somewhat exceeded the investment plan, this was not the case in 2022, with investment realisation significantly lower than the values indicated in both the development and the investment plan. In terms of the planned investment values, 2023 sees an even greater disparity between the development plan and the investment plan, which calls into question the implementation of the national targets set out in the NECP.

FIGURE 51: COMPARISON OF THE AMOUNTS IN THE DEVELOPMENT AND INVESTMENT PLANS FOR THE ELECTRICITY DISTRIBUTION SYSTEM ALONG WITH THE REALISATION

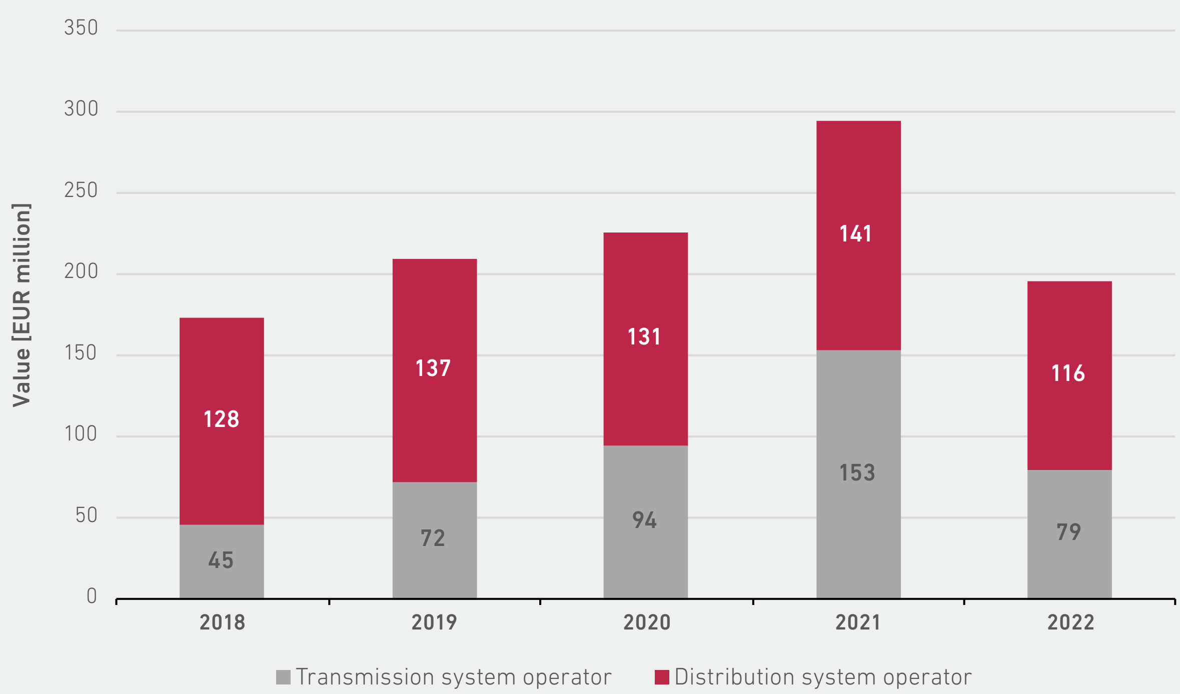


SOURCE: SODO

Supervision over the Implementation of Electricity System Operators' Development Plans

In 2022, the transmission system operator allocated EUR 79.4 million to investments, which is 44.6% more than the resources envisioned in the development plan/regulatory framework. Out of that amount, EUR 60.9 million was allocated to new investments, EUR 9.2 million to reconstructions, and EUR 9.3 million to other business investments. The largest share, 63.1%, was allocated to network investments, followed by smart grid investments (20.3%), and other business investments (11.7%). A smaller share comprises investments into secondary equipment and telecommunications and operational investments. Among the new constructions, the investments that stand out in terms of value include the completion of the 400 kV cross-border transmission line Cirkovce–Pince for EUR 22.4 million, a EUR 10.4 million investment in consumer electricity use optimisation, and the construction of the 400/110 kV transformer installation at DTS Beričevo for EUR 7.9 million. In terms of reconstructions, significant investments include the renovation and replacement of electrical equipment worth EUR 4.7 million and secondary equipment worth EUR 2 million in the distribution-transformer stations in the transmission system.

FIGURE 52: TRANSMISSION SYSTEM OPERATOR AND DISTRIBUTION SYSTEM OPERATOR INVESTMENTS FOR 2018–2022



SOURCES: ELES, SODO

In 2022, the DSO and the owners of the distribution system earmarked EUR 116.3 million for investments into the distribution network, which is only 87.1% of the funds planned in the regulatory framework, and only 52.9% of the funds planned in the development plan. Out of that amount, EUR 63.5 million was allocated to new investments, EUR 34.8 million to reconstructions, and EUR 18 million to other business investments. In terms of voltage level, the majority of the investments, 39.5%, were in the medium-voltage network, followed by 28.1% in the low-voltage network and 18.1% in the high-voltage network. The remaining amount comprises investments in secondary equipment (12.6%) and other business investments. By type, investments in medium-voltage underground lines

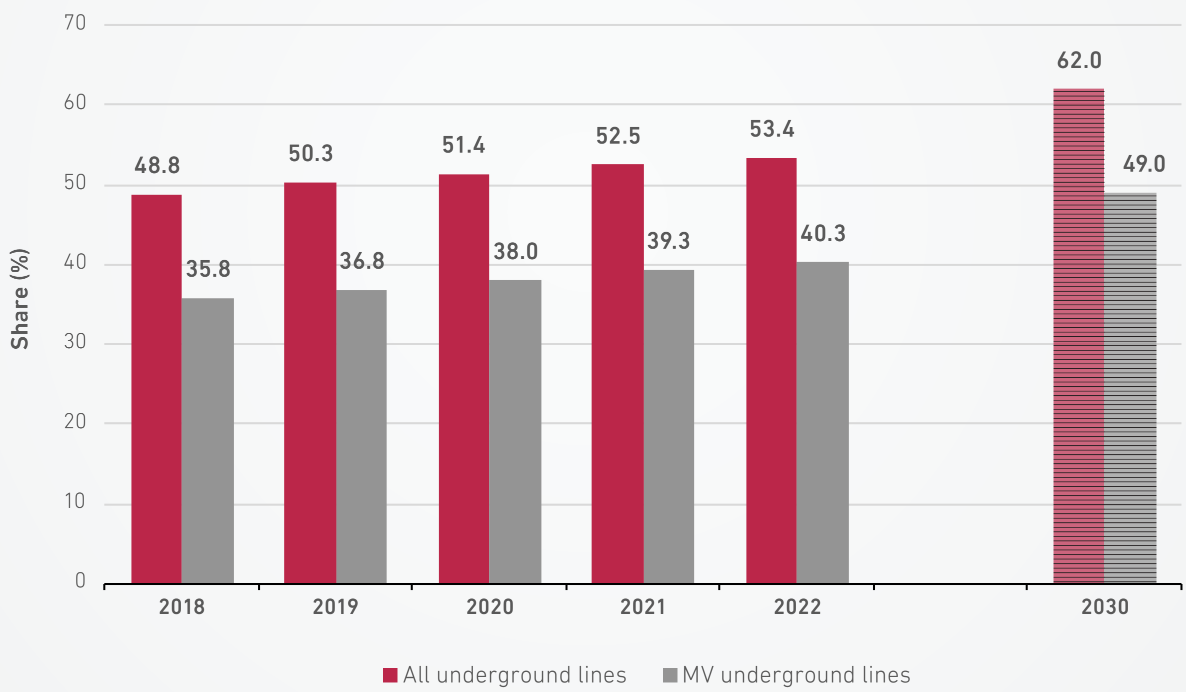
The lowest realisation of investments by the distribution system operator since 2015

dominated in terms of new constructions, followed by investments in low-voltage underground lines and HV/LV substations. Regarding reconstructions, most of the funds were allocated to low-voltage underground lines and HV/LV substations. In 2022, the lowest realisation of the DSO's investments, in terms of value, in the post-2015 period was recorded, which is largely due to the liquidity problems of the distribution companies as a result of the measure taken by the Government of the Republic of Slovenia that involved reducing all tariff rates for the billed capacity and effective energy received for all consumer groups to zero from 1 February to 30 April 2022.

53.4% share of underground lines in the distribution system

In recent years, the share of underground lines in the distribution system has been increasing by 1.1% a year on average, representing 53.4% of all the distribution lines at the end of 2022, or 40.3% when looking only at the MV distribution lines. If growth continues at this rate, we will barely approach the NECP target of at least 50% of underground MV lines by 2030 to increase the resilience of the electricity distribution network.

FIGURE 53: GROWTH IN THE SHARE OF UNDERGROUND DISTRIBUTION LINES IN THE 2018–2022 PERIOD AND A PROJECTION FOR 2030



SOURCES: ENERGY AGENCY, SODO, EDC

TABLE 22: ELECTRICITY TRANSMISSION AND DISTRIBUTION INFRASTRUCTURE IN SLOVENIA AT THE END OF 2022

Transmission system	
400-kV line	828 km
220-kV line	328 km
110-kV line	1,958 km
HV/HV DTS	8
110-kV DS	1
Distribution system	
110-kV lines	922 km
35-kV, 20-kV, 10-kV lines	18,518 km
0.4-kV lines	45,506 km
110-kV/MV DTS	96
MV/MV DTS	7
MV DS	79
MV/LV TS	18,542

SOURCES: ELES, SODO, EDCS

Development of the Advanced Metering System in Slovenia

Slovenia is one of the leading European countries in terms of the installation of advanced metering devices. At the end of 2022, no fewer than 91.9% of consumers connected to the distribution system were equipped with advanced metering devices, and 89.2% were included in remote meter reading.

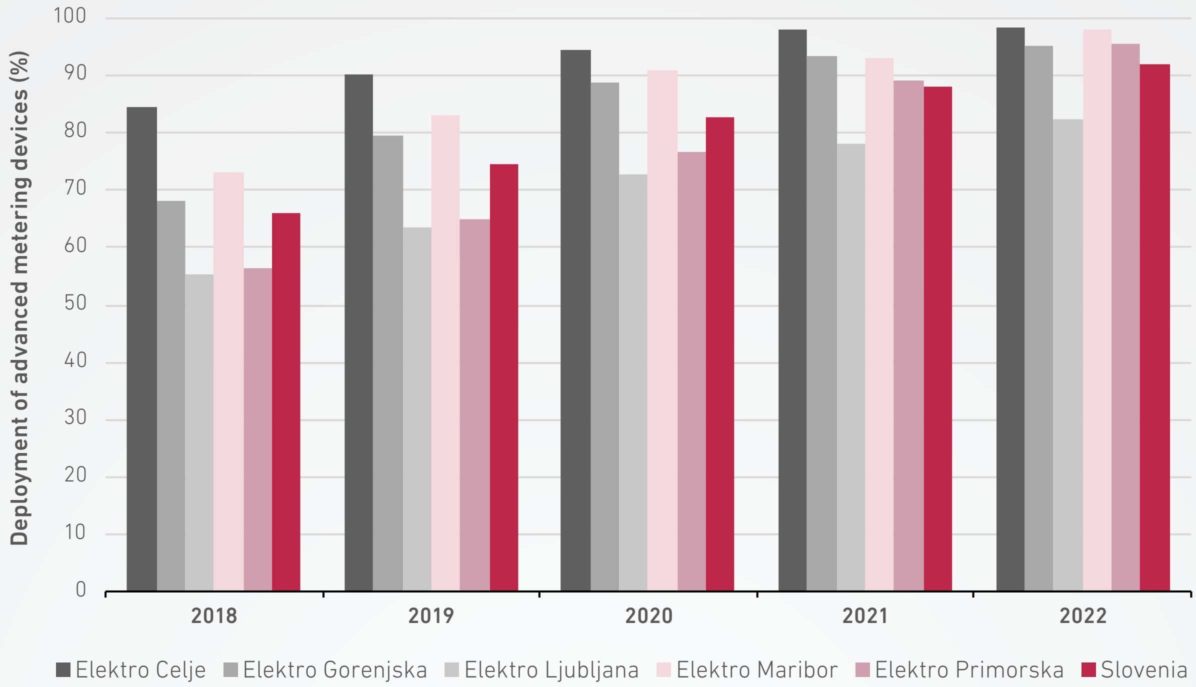
91.9% of consumers connected to the distribution system were equipped with advanced metering devices;

20% of those do not permit data acquisition at 15-minute intervals

Unfortunately, the installed metering devices are still lacking the minimum level of functionality required to provide the metering data necessary for the effective development of the electricity market. The provision of 15-minute metering data is of particular concern, as it impedes the transition to the new network charge calculation methodology. Roughly 20% of the consumers' metering devices lack the 15-minute acquisition interval capability entirely, whereas with the rest, the availability of this data is unstable and dependent on the network conditions. An additional problem is the difficulty of processing such a large amount of data in the distribution companies' measuring centres, as the tools that have been used thus far have proved unsuitable.

The case study below provides a more detailed overview of the situation with regard to metering devices with a 15-minute data resolution evaluated through key indicators (see subsection Providing Consumers with Standardised Data Services).

FIGURE 54: TREND OF DEPLOYMENT OF ADVANCED METERING DEVICES IN THE 2018–2022 PERIOD



SOURCES: EDCs

Development of Smart Grids and the 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[36]. This 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 the 2022 regulatory period, the Energy Agency continued promoting smart grid investments, as well as research and innovation by the electricity system operators, through dedicated incentive schemes. The schemes have remained unchanged since the 2019–2021 regulatory period and were presented in detail in the Report on the State of the Energy Sector in Slovenia in 2020.

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

Smart Grid Investments

In 2022, the Energy Agency has not received any new project applications for smart grid investments. Two major smart grid projects, NEDO and SINCRO.GRID, are winding down. The GreenSwitch project has commenced, which involves a consortium of companies from Slovenia, Austria and Croatia and is coordinated by ELES. The project aims to optimise the level of utilisation of the existing electricity infrastructure and to enable the integration of new technologies and advanced functionalities into the transmission and distribution networks in Austria, Croatia and Slovenia.

Due to the mechanism for accounting for deviations from the regulatory framework, the investment realisation data for 2022 is not available. All of the values below therefore pertain to 2021. Figures 55 and 56 show the structure of investment realisation by the electricity system operators and electricity distribution companies (EDCs) by smart grid function.

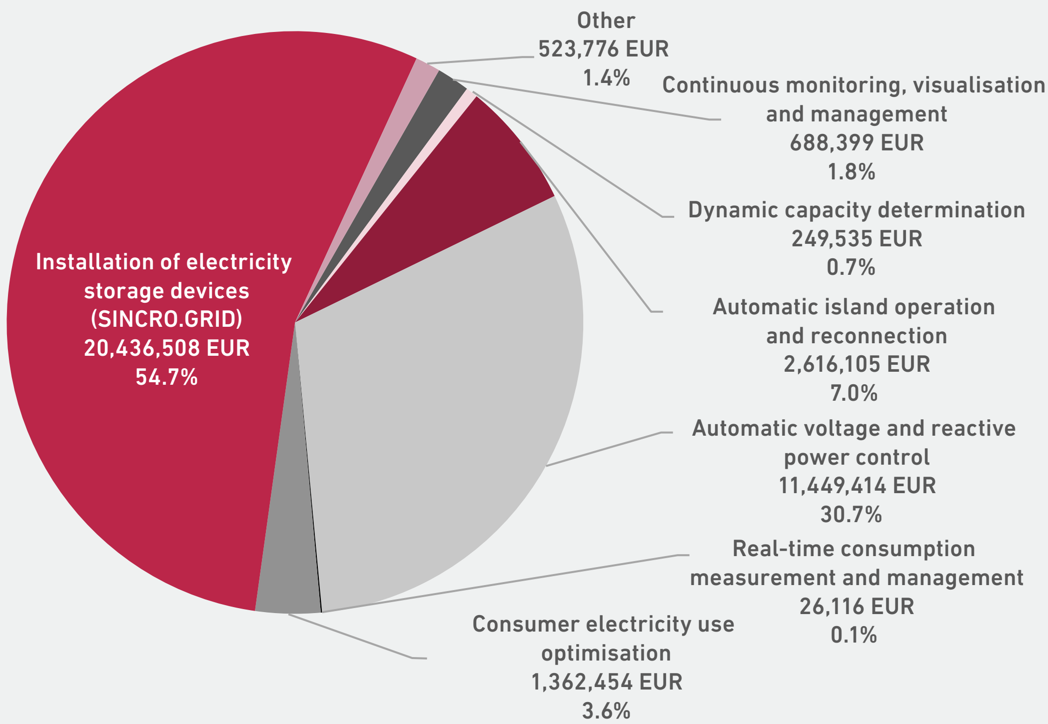
36 Update of the national smart grid roadmap, study No: 2444, EIMV, FE, FERI, Ljubljana, November 2020

The total value of ELES' investments in smart grids amounted to approximately EUR 37.35 million, making up 24.5% of the company's total investments in that year. More than half of that (54.7%) is accounted for by the installation of battery storage in the scope of the SINCRO.GRID project.

The total value of EDCs' investments in smart grids[37] amounted to approximately EUR 0.78 million, making up 0.56% of the total investments in distribution that year. The investments were split between mass data processing and automatic feeder and line switching in the MV network as part of the 2nd phase of the NEDO project.

A total of EUR 38.1 million in smart grid investments in 2021

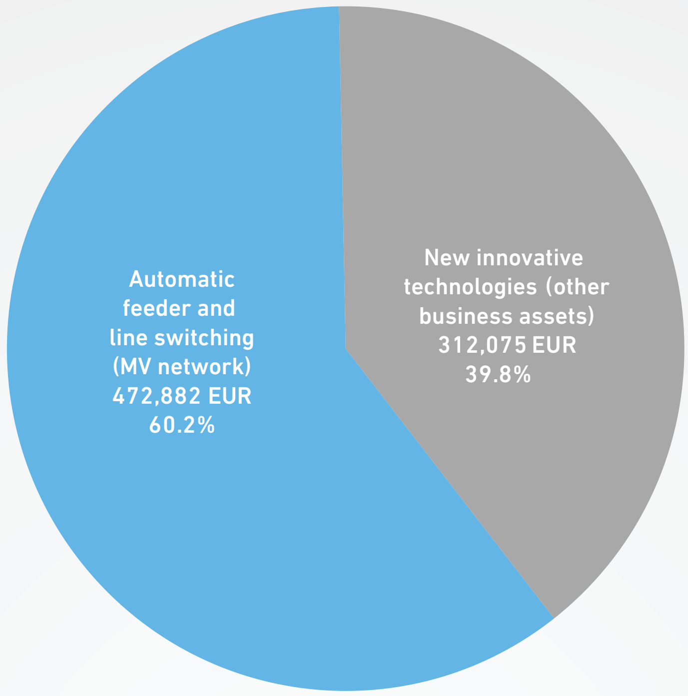
FIGURE 55: STRUCTURE OF ELES' INVESTMENTS IN 2021 BY SMART GRID FUNCTION



SOURCE: ENERGY AGENCY

37 In 2021, Elektro Ljubljana was the only distribution company to invest in smart grids.

FIGURE 56: STRUCTURE OF DISTRIBUTION INVESTMENTS IN 2021 BY SMART GRID FUNCTION



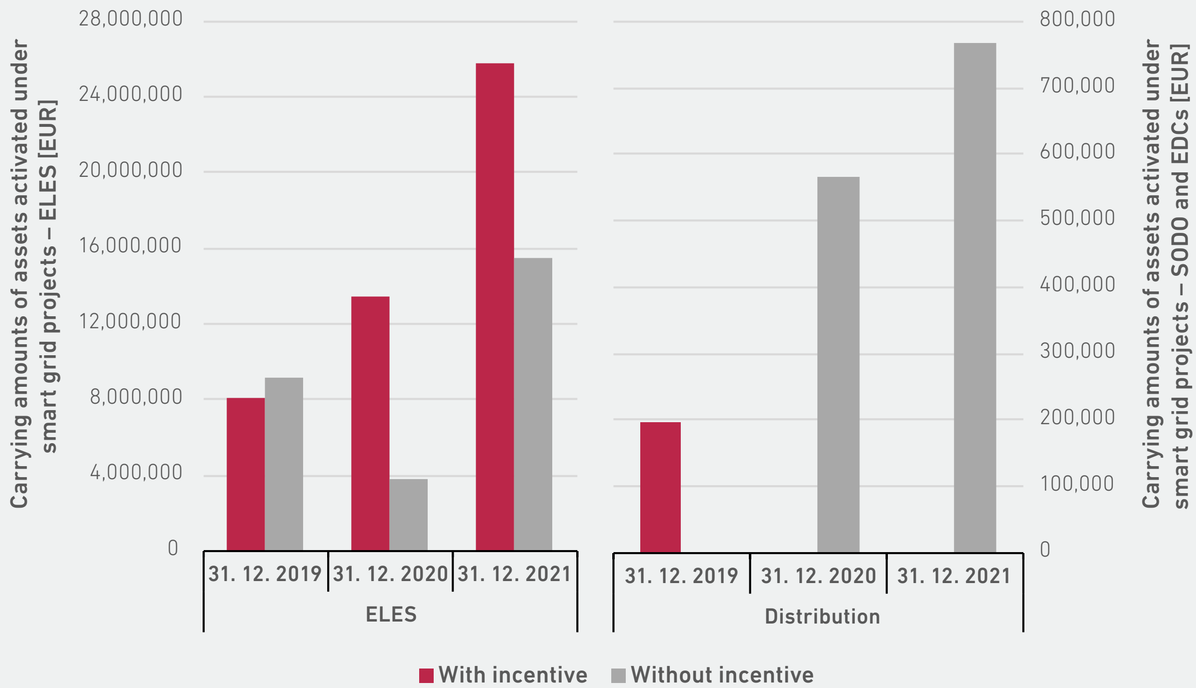
SOURCE: ENERGY AGENCY

At the distribution level, there still aren't enough investments into smart grids, which is inconsistent with the development strategy

Smart grid investment incentive scheme projects are qualified for implementation on the basis of a project application submitted to the Energy Agency. Incentives are granted on the basis of the qualification of the project and an assessment of the associated activated assets, which must meet the definition of smart grids and smart energy infrastructure as set out in the general act governing the methodology for determining the regulatory framework. The Energy Agency grants incentives on the basis of an assessment of the assets that are actually activated under the qualified smart grid project as reported by those with a reporting obligation in the annual process of identifying deviations from the regulatory framework. Figure 57 shows a comparison of the carrying amounts of the assets activated under smart grid projects that were granted an incentive and the carrying amounts of smart grid assets for which companies do not receive incentives. At the distribution level, SODO received an investment incentive in 2019, while Elektro Ljubljana did not apply for an incentive for investments in 2020 and 2021. The rest of the EDCs did not invest in smart grids, despite the revised strategy for smart grid development[38].

38 EIMV, UM-FERI, UL-FE, Update of the National Smart Grid Roadmap, study No: 2444, 2020

FIGURE 57: OVERVIEW OF THE CARRYING AMOUNT OF ACTIVATED SMART GRID ASSETS BY COMPANY



SOURCE: ENERGY AGENCY

The data shows that the distribution companies continue to be generally passive in terms of investments in smart grids, with only SODO and Elektro Ljubljana reporting such investments. The distribution system investments in question fall short of the projections in the smart grid strategy set out and, as a consequence, may hinder the development of the grid needed to achieve the green transition objectives. Investments by SODO are linked to the implementation of the ELES-led SINCRO. GRID project. Similarly, four[39] of the EDCs are involved, as infrastructure owners, in the implementation of the NEDO project, likewise led by ELES. At the end of the project, part of the NEDO project assets is expected to be transferred from ELES to the EDCs, since some of the assets currently held by ELES are essentially intended for use in distribution.

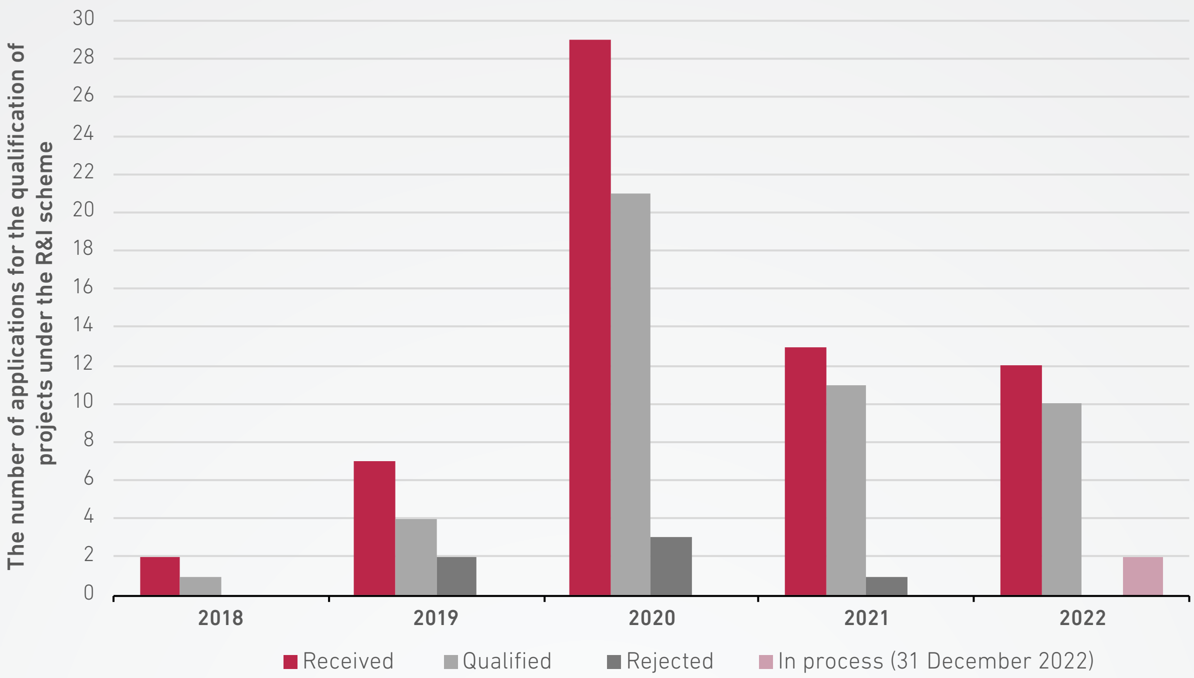
Projects Included in the Research and Innovations Scheme

In 2022, the Agency received 9 applications for the qualification of projects for the research and innovation scheme (R&I scheme). 10 projects qualified[40] and 10 were finished. By the end of 2022, only two projects remained in the process of qualification. Figure 58 shows the number of applications for the qualification of projects under the R&I scheme by individual year. The applications processed in 2022 included no projects featuring performance incentives by the Energy Agency aimed at eliminating regulatory barriers to the implementation of innovative measures that are not possible under the existing regulatory framework and that involve the active participation of consumers. Compared to previous years, the number of applications in 2022 has been stabilising.

10 projects newly qualified for the R&I scheme

39 Elektro Celje, Elektro Ljubljana, Elektro Maribor, Elektro Primorska
40 Some of the applications were submitted in 2021.

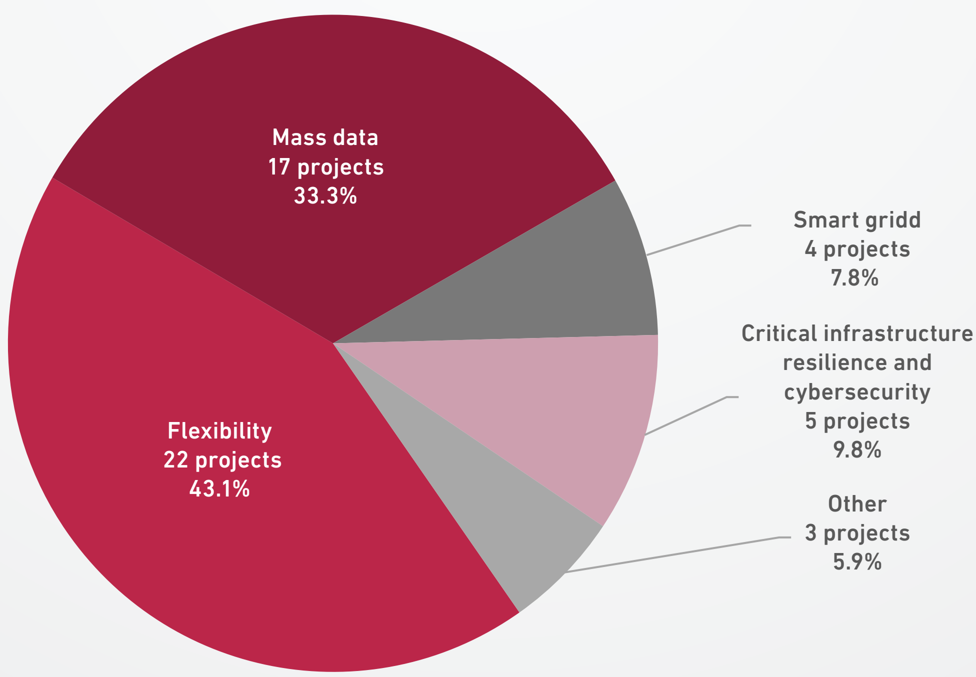
FIGURE 58: OVERVIEW OF THE NUMBER OF APPLICATIONS FOR THE QUALIFICATION OF PROJECTS UNDER THE RESEARCH AND INNOVATION INCENTIVE SCHEME



SOURCE: ENERGY AGENCY

Figure 59 features an overview of the central subjects of all the projects qualified by the end of 2022. The structure of the subjects is similar to the previous year. There has been a noticeable increase in projects addressing critical infrastructure resilience, including cybersecurity. The share of projects addressing flexibility and the share of projects addressing the use of mass data for the benefit of the electricity system remain high.

FIGURE 59: STRUCTURE[41] OF THE MAIN TOPICS OF QUALIFIED PROJECTS UNDER THE RESEARCH AND INNOVATION INCENTIVE SCHEME



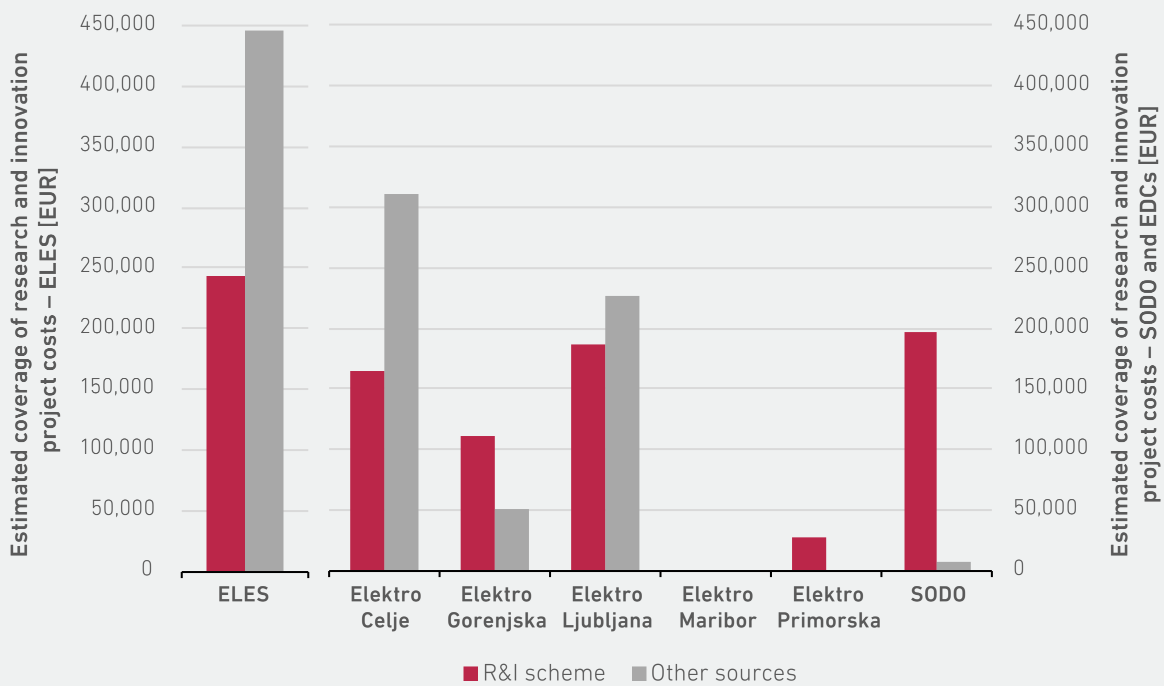
SOURCE: ENERGY AGENCY

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

In the 2022 regulatory period, the electricity system operators and the EDC developed new projects, as well as continued to implement those in progress, with approximately EUR 0.93 million covered by the R&I scheme and EUR 1.04 million from other sources (Horizon Europe, Slovenian Research Agency, etc.). Compared to the previous (three-year) regulatory period of 2019–2021, the ratio of the above in 2022 is significantly more balanced, indicating that the R&I scheme is becoming increasingly established at the regulated companies. Figure 60 shows the estimated[42] costs of the projects covered by the R&I scheme and other sources by company for 2022. At ELES, a considerable increase in the coverage of costs from the R&I scheme compared to the 2019–2021 regulatory period is evident. At Elektro Gorenjska, a change in the predominant coverage of costs from the RI scheme is noticeable. Project applicants were very successful in obtaining co-financing from other sources in the 2022 regulatory period, as well. The data shows that six regulated companies[43] are involved in the R&I scheme, four of which[44] extensively combine the R&I scheme with other sources when covering the qualifying projects' costs. Elektro Maribor had no project activities under the R&I scheme.

EUR 0.93 million for qualified projects under the R&I scheme

FIGURE 60: COST COVERAGE FOR QUALIFIED PROJECTS UNDER THE RESEARCH AND INNOVATION INCENTIVE SCHEME BY COMPANY (ESTIMATE FOR THE 2022 PERIOD)

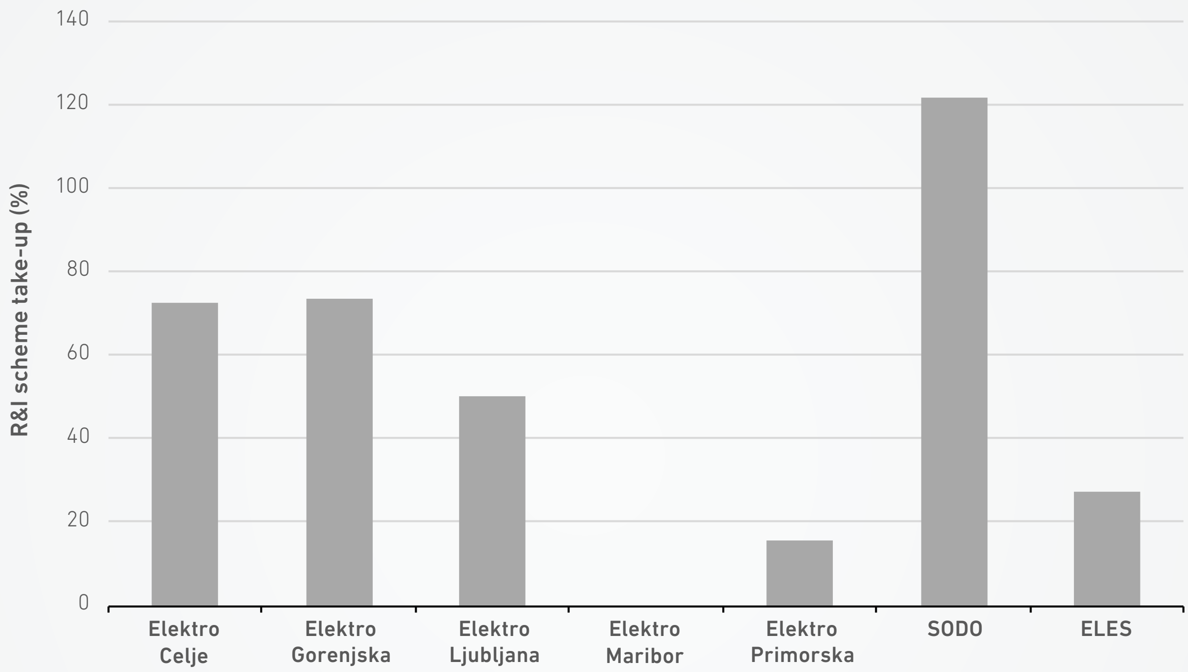


SOURCE: ENERGY AGENCY

42 When the duration of a project exceeds the 2022 regulatory period, the costs of the project were distributed between the 2022 regulatory period and the remaining duration of the project assuming an even distribution of costs over time for the duration of the project.
43 Elektro Celje, Elektro Gorenjska, Elektro Ljubljana, Elektro Primorska, ELES, SODO
44 Elektro Celje, Elektro Gorenjska, Elektro Ljubljana, ELES

The costs earmarked for research and innovation for a given company are capped at 0.5% of the recognised sources for covering the company's eligible costs. This also makes it possible to assess the uptake[45] of the R&I scheme with qualified projects on a company-by-company basis against the planned values under the regulatory framework, as shown in Figure 61.

FIGURE 61: TAKE-UP OF THE R&I SCHEME BY COMPANY AS A PERCENTAGE OF THE PLANNED VALUES UNDER THE REGULATORY FRAMEWORK (ESTIMATE FOR 2022)



SOURCE: ENERGY AGENCY

45 The mechanism for accounting for deviations from the regulatory framework prevents an assessment of the actual realisation. Accordingly, a case study was prepared on the basis of the realisation of projects from the R&I scheme from the 2019–2021 regulatory period.

CASE STUDY
The Realisation of Qualifying Projects from the R&I Scheme in the 2019–2021 Regulatory Period

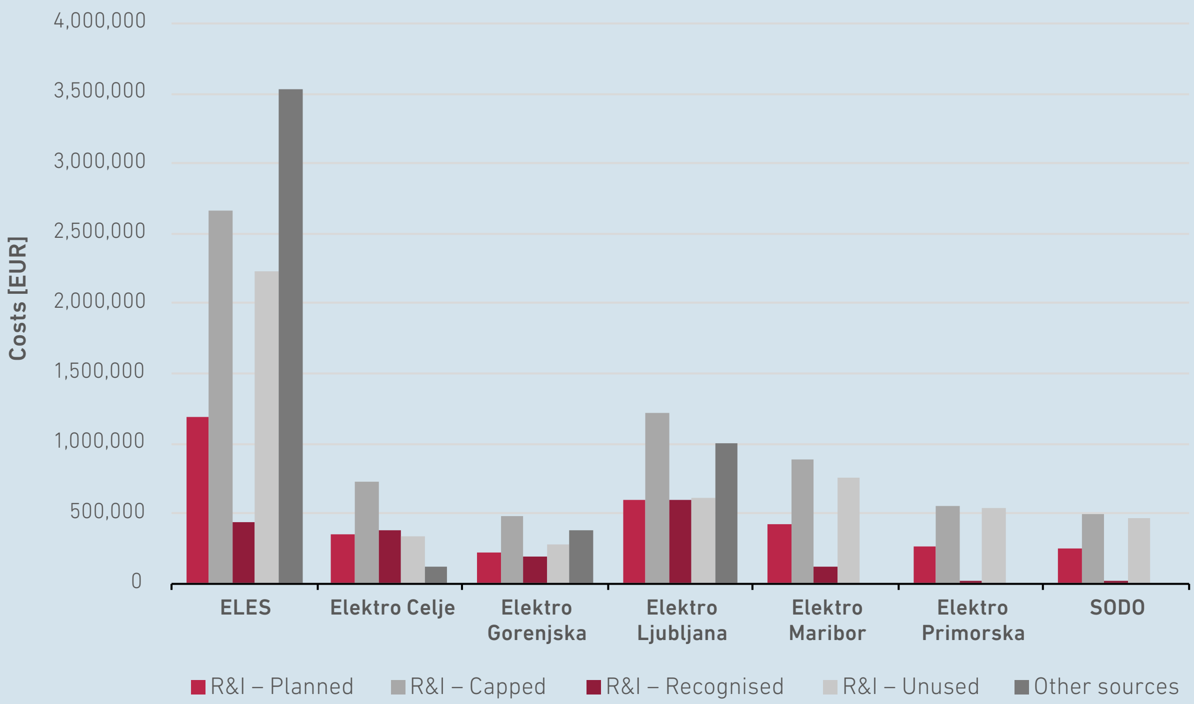
In the 2019–2021 regulatory period, the planned costs for the realisation of R&I projects represented 0.25% of the planned resources for covering the eligible costs in 2018 (marked »R&I – planned« in Figure 62). In the general act regulating the methodology for determining the regulatory framework, the Agency capped the costs allocated to research and innovation for a given company at 0.5% of the recognised sources for covering the company's eligible costs (marked »R&I – capped« in Figure 62).

The established mechanism for identifying deviations from the regulatory framework makes the continuous estimation of actual realisation of costs impossible; costs can only be estimated once the procedure for calculating the deviations from the regulatory framework is finished.

Figure 62 compares the absolute value of the planned, capped, realised and unused (marked »R&I – unused« in Figure 62) costs from the R&I scheme. Figure 63, meanwhile, shows the percentage value of R&I scheme utilisation with respect to the aforementioned cap. Analysing the data from the 2019–2021 regulatory period shows that in this period, the regulated companies realised the costs of the project activities under the R&I scheme cap to a lesser extent (marked »R&I – recognised« in Figure 62). In this period, some of the regulated companies covered more of the costs of the project activities from other sources (resources acquired free of charge – marked »Other sources« in Figure 62).

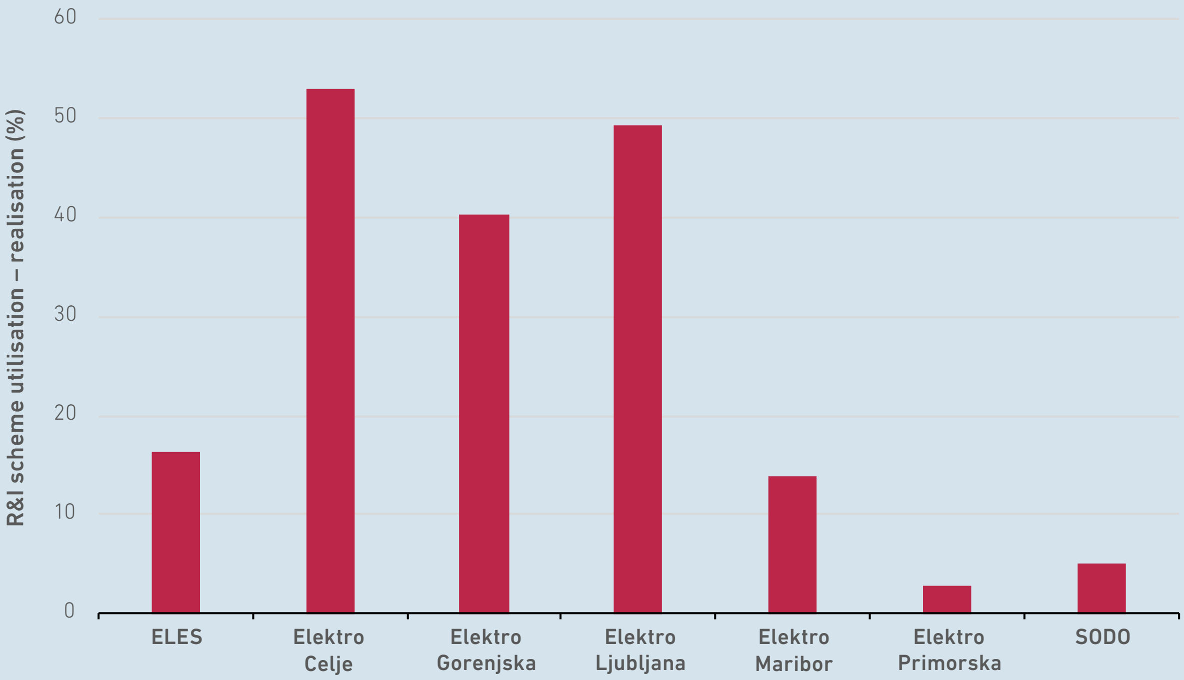
During the period in question, the companies did not significantly exceed the planned costs, indicating adequate cost planning in the period.

FIGURE 62: R&I SCHEME UTILISATION BY INDIVIDUAL COMPANY WITH RESPECT TO THE PLANNED VALUES FROM THE 2019–2021 REGULATORY FRAMEWORK AND RESOURCES ACQUIRED FREE OF CHARGE FROM OTHER SOURCES



SOURCE: ENERGY AGENCY

FIGURE 63: THE SHARE OF RECOGNISED RESEARCH AND INNOVATIONS COSTS BY INDIVIDUAL COMPANY IN THE PROCESS OF IDENTIFYING DEVIATIONS FROM THE 2019–2021 REGULATORY FRAMEWORK WITH RESPECT TO THE CAPPED VALUE



SOURCE: ENERGY AGENCY

Cybersecurity of the Power System

In light of the modern economies' complete dependence on electricity, attention is focused on measures for ensuring the reliability and flexibility of the electricity system, which is exposed to higher levels of variability in both supply and demand, and steps to ensure resilience against new cybernetic threats. In the field of cybersecurity, these measures are important due to the energy sector's vulnerability to cybernetic threats, which is mostly due to specific structural risks – the complexity of the information systems operating in the sector – including the networks and business data processing solutions (IT) and operational technology (OT) in the context of the digitalisation and convergence of IT/OT domains, as well as miscellaneous risks, e.g. risks due to geopolitical conflicts. The aforementioned risks underline the sector's susceptibility to threats with potential effects on the security of supply. In line with these challenges, there are plans/strategies/legislation being implemented or adopted that address these issues in both the wider and narrower context – the EU Action Plan on Digitalising the Energy Sector[46], the EU Cybersecurity Strategy[47], Directive (EU) 2022/2555 (NIS2)[48] and the network rules on cybersecurity in the energy sector[49], to name just a few of the most important ones.

46 https://digital-strategy.ec.europa.eu/sl/policies/digitalisation-energy
47 https://digital-strategy.ec.europa.eu/sl/policies/cybersecurity-strategy
48 https://www.nis-2-directive.com/
49 https://www.entsoe.eu/network_codes/nccs/

The electrical infrastructure is exposed to increasingly serious cybernetic threats due to the significant expansion of digitalisation and connectivity in the sector[50,51]. Establishing and maintaining cyber-resilience is vital to ensure the reliable operation of electricity systems and manage the impact of potential cyberattacks. Key steps to improve cyber resilience in electricity systems include risk assessment, the enforcement of security measures, enhanced training, cooperation and information exchange, raising awareness and cooperation between states, regulators, energy companies and other stakeholders in order to effectively implement measures to increase cyber resilience in electricity systems.

Based on past cyberattacks and trends in the energy sector, the publicly available sources[52] highlight the following as the most common risks in the cyber risk landscape:

a) Crypto virus attacks: crypto viruses that encrypt files and demand payment for their decryption. There has been a considerable increase in these recently and they are increasingly common in the energy sector.

b) Ransomware virus attacks: ransomware attacks remain highly frequent. They can cause major problems for the operation of critical infrastructure.

c) Management/control system attacks: cyberattacks targeting the management and control systems can have serious consequences, as they allow the attackers to take control of energy infrastructure.

d) Malware attacks: malware such as trojans and viruses continue to be a major problem in cybersecurity as they allow the attackers to steal sensitive information and disrupt system operation.

e) Attacks on IoT devices: as IoT devices become more widespread in the energy sector, this type of cyber risk is becoming increasingly critical, as attacks on these devices can lead to the disruption of services and even physical damage.

f) Identity spoofing attacks: attackers can use stolen credentials or other methods to gain access to sensitive data or systems in the energy sector.

g) Internal attacks: internal attacks can be every bit as dangerous as external ones, as the attackers have system access to begin with and can cause a great deal of damage if they choose to abuse their access privileges. This includes, among other things, the intentional or unintentional misuse of data and unauthorised modifications to systems. To vključuje med drugim namerno/nenamerno neustrezno ravnanje s podatki in nepooblaščene spremembe v sistemih.

Below we highlight some of the other key trends and challenges that may be relevant for the energy sector in the future:

a) Inadequate cyberinfrastructure: certain elements of electricity systems may have been designed before the digital age and may have deficient cyberinfrastructure as a result. This includes outdated hardware and software that may lack security mechanisms. Updating and upgrading such systems takes time, resources and careful planning.

b) Advanced Persistent Threats (APTs): future attacks targeting the energy sector will be increasingly targeted and more advanced. This could include attacks tailored to specific devices or networks and attacks employing advanced techniques, such as AI-supported and social engineering attacks. Defending against APTs will require the use of advanced technologies and tools.

c) The use of artificial intelligence and machine learning in attacks: the attackers will likely expand their use of artificial intelligence and machine learning to more effectively target and attack the energy system.

d) Attacks exploiting the increased scope of electricity systems: through the use of the Internet of Things (IoT) and other smart devices, the range of risks will expand, increasing the risk of cyberattacks targeting even more devices and systems.

e) Attacks targeting the cybersecurity of suppliers: the attackers are likely to increase their focus on suppliers and other external partners of electricity companies, which could represent weak points in the cybersecurity chain.

f) Rapid response and incident management: the rapid detection, response and management of cybernetic incidents are key challenges within the energy sector.

g) Awareness and training: a lack of trained cybersecurity professionals is one of the greatest challenges in defending against cyberattacks in the energy sector.

50 Enhancing Cyber Resilience in Electricity Systems, International Energy Agency (IEA)
51 Global Risk Landscape 2022 by the World Economic Forum
52 ENISA, Accenture, energy departments at US-DOE, Deloitte, IBM and Kaspersky

These are just some of the trends and challenges highlighted in the latest reports by ENISA, Accenture, The US Department of Energy, Deloitte, IBM and Kaspersky. In light of the continuously changing cyber threat landscape, we cannot afford to generalise these conclusions. In order to successfully defend against novel threats and risks, cybersecurity needs to constantly adapt and improve.

Regulatory Aspects – Important Activities

The strategic normative framework for ensuring the information security of the energy system is based on the following essential building blocks: the EU's Cybersecurity Strategy for the Digital Decade, the EU Action Plan on Digitalising the Energy Sector, Directive (EU) 2016/1148 of the European Parliament and of the Council of 6 July 2016 concerning measures for a high common level of security of network and information systems across the Union (NIS), 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) and in the future also on network rules for cybersecurity in the EU energy sector (Cybersecurity Network Code - CSNC), which are still under preparation.

In 2022, activities covering the legislative aspects of cybersecurity in the energy sector and specific regulatory aspects within the scope of the national regulators continued. Part of the Energy Agency's responsibilities is to monitor investments in cybersecurity, including activities performed by public service companies in the area of information security and data protection, and the associated development activities. The Agency participates in raising awareness among stakeholders and monitors their activities in the area of cybersecurity. In addition, the Energy Agency provides the participants with up-to-date information via the Slovenian Energy Security Forum (SEVF).

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

Operational Aspects – Important Activities

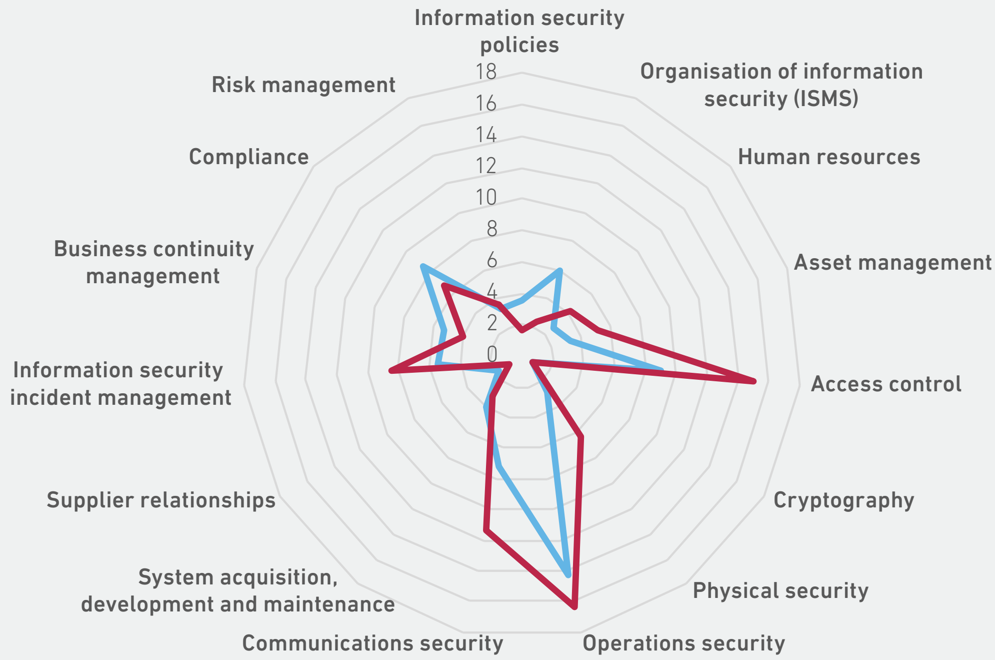
Public Service Companies

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

Activity monitoring by area and sub-area according to ISO 27002

Public service companies implemented additional actions, primarily in the areas of information (IT) and operational (OT) technology. 58% of the activities were carried out in the area of IT and 25% in the area of OT. A summary of the most important measures/activities by stakeholder, broken down by domains and areas per ISO/IEC 27002, is provided in Table 23, while the polar chart in Figure 64 shows the normalised distribution of activities by domain.

FIGURE 64: THE NORMALISED DISTRIBUTION OF ACTIVITIES AND THE TREND IN THE VOLUME OF ACTIVITIES BY PUBLIC SERVICE COMPANIES BY DOMAIN



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

TABLE 23: SCOPE OF PUBLIC SERVICE COMPANIES' ACTIVITIES IN THE FIELD OF INFORMATION SECURITY / CYBERSECURITY

Domain	Area	ELES	SODO	EL-MB	EL-CE	EL-LJ	EL-GO	EL-PR	Gas pipelines
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	Supplier relationships	–	–	–	–	✓	–	–	✓
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		–	–	–	✓	✓	✓	–	✓

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

Key: By domain
✓ One or two activities
✓✓ More than three activities
✓✓✓ More than six activities
– Scope unchanged

The scope of activity

In the scope of additional activities by the public service companies, the sub-areas according to ISO 27002 are given in a multi-level pie chart (Figure 65). Most of the activities took place in the sub-area of »Network services security«, »Technical vulnerability management« and »Cybersecurity awareness-raising, education and training«.

FIGURE 65: THE MOST IMPORTANT SUB-AREAS OF ADDITIONAL ACTIVITIES BY PUBLIC SERVICE COMPANIES BY SUB-AREA ACCORDING TO ISO 27002

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

ELES

In 2022, the transmission system operator carried out 45 additional activities within the scope of regular activities, of which 64% were in the area of business data processing and 33% in the area of operational technology. The major sub-areas in terms of improving the maturity of controls in information security in areas according to ISO 27002 were in the areas of operational security, communication security and compliance.

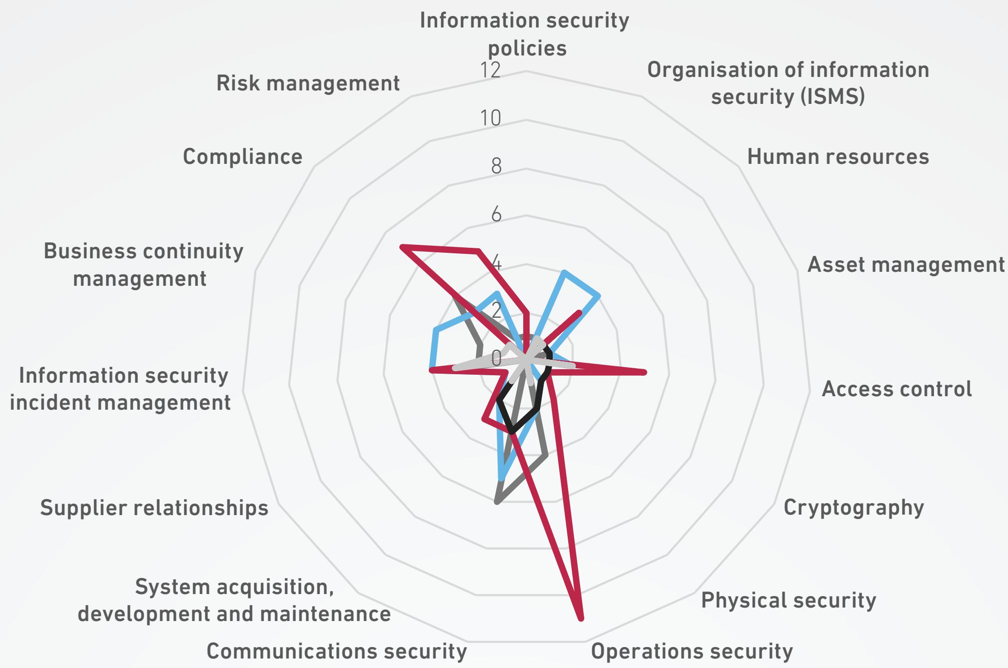
SODO

In 2022, the distribution system operator carried out 30 additional activities within the scope of regular activities, most of which were in the area of business data processing.

Distribution Companies

In 2022, EDCs carried out a total of 129 important activities in the area of information security. Of those activities, 54% were in the area of business data processing, 17% in the area of operational technology, 9% in the area of measurements and 20% were miscellaneous activities. The major areas of improving the maturity of controls in information security in areas according to ISO 27002 are highlighted in the polar chart in Figure 66 and the trend in the volume of activities by distribution companies in the polar chart in Figure 67.

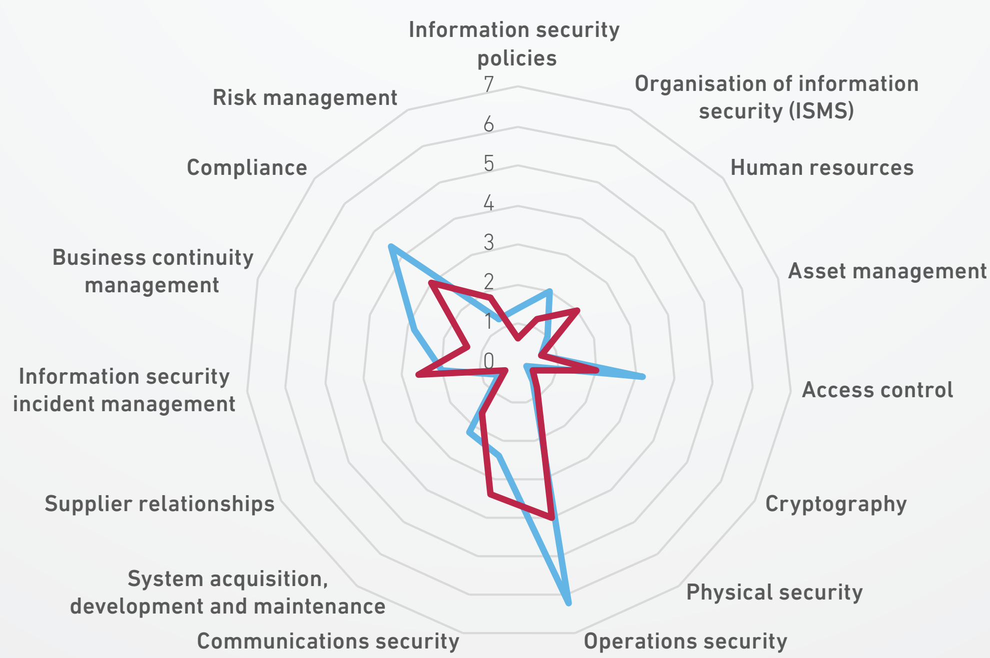
FIGURE 66: NORMALISED DISTRIBUTION OF THE VOLUMES OF ACTIVITIES BY EDCS BY AREA



SOURCES: ENERGY AGENCY, EDCS

Compared to the previous year, most of the EDCs' activities were in the areas of operational security, access management, incident management and compliance, as shown in Figure 67.

FIGURE 67: NORMALISED COMPARISON OF THE TOTAL VOLUME AND TREND OF ADDITIONAL ACTIVITIES BY EDCS

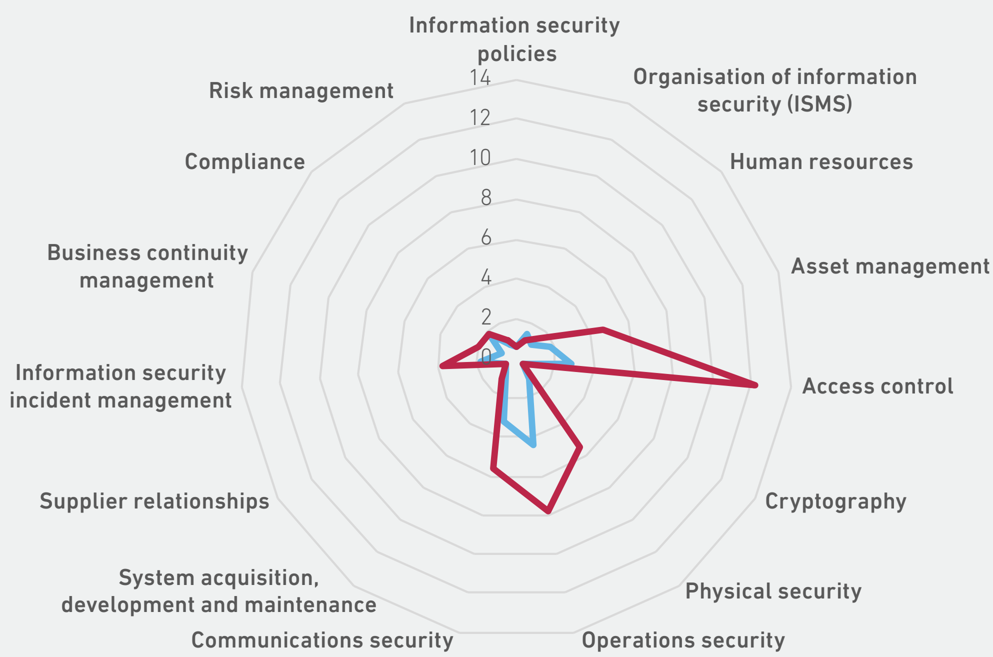


SOURCES: ENERGY AGENCY, EDCS

Plinovodi

The volume of activities carried out by the natural gas transmission system operator in 2022 significantly increased (likewise in comparison with the EDCs in aggregate). Complementing the regular activities, 248 additional activities were carried out – 54% in the area of business data processing, 31% in the area of operational technology and 15% were miscellaneous activities (e.g. personal data protection, etc.). The improvement in the maturity of informational security controls in areas according to ISO 27002 was focused on the management of access to systems and applications, operational security, communications security, physical security, asset management and incident management (Figure 68).

FIGURE 68: NORMALISED COMPARISON OF THE TOTAL VOLUME AND TREND OF ADDITIONAL ACTIVITIES BY THE PLINOVODI COMPANY



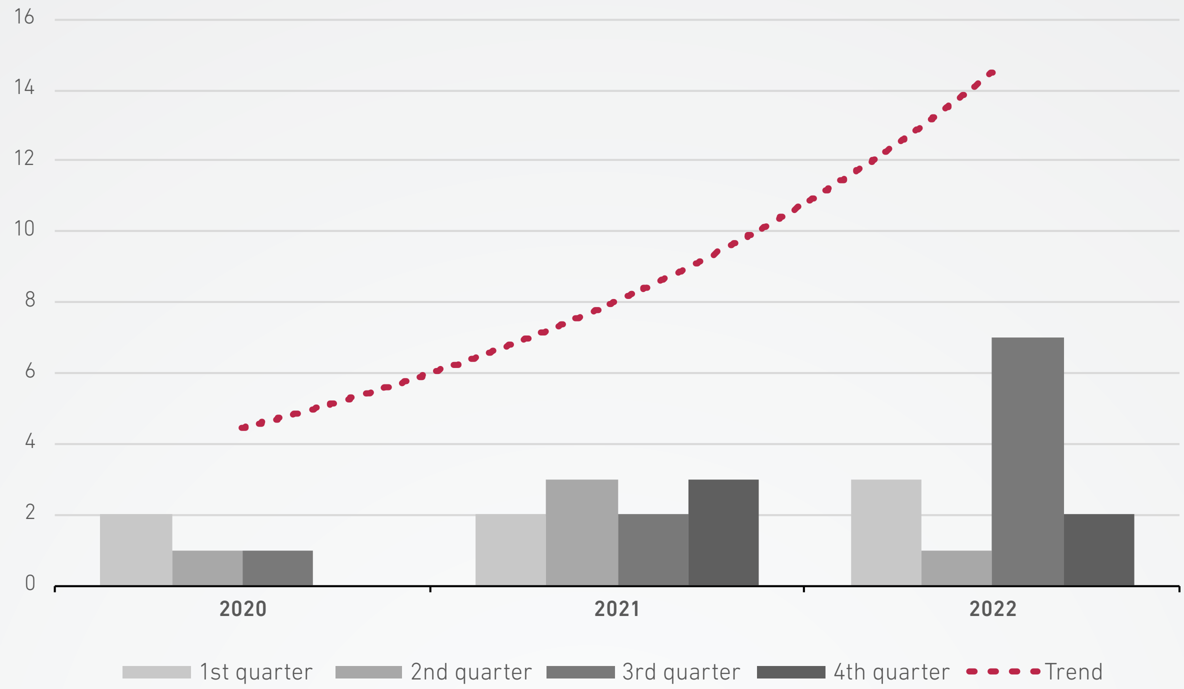
SOURCES: ENERGY AGENCY, PLINOVODI

Cyber Incidents in the Energy Sector

The first and second half-years of 2022 were marked by cyber activities associated with the escalation of the geopolitical situation. With respect to comparable periods in the past, the first half of 2022 set a new milestone in terms of the number of notified incidents and a new record in terms of notified incidents was set in the second half of 2022. The total number of incidents reported by SI-CERT (evaluated according to NOKI[53] – the national cyber incident response plan) was 3498, with 0.4% of those occurring in the energy sector. Despite this small – but not at all insignificant – percentage, there are indications of an exponential growth in incidents (Figure 69).

53 The national cyber incident response plan

FIGURE 69: THE GROWING TREND IN CYBER INCIDENTS IN THE ENERGY SECTOR



SOURCES: ENERGY AGENCY, URSIV, SI-CERT

Strategic Aspects – Challenges

Public service companies responsible for energy supply face mounting challenges in addressing the increasing cybersecurity risks, including a lack of strategic focus, a general tendency towards limiting the disclosure of institutional information, a limited pool of human resources, skills and know-how and reduced information exchange among stakeholders. Despite the fact that prevention will focus on threat reduction, vulnerability analysis and reducing the impact of attacks, the public service companies' main emphasis will be on a flexible digital layer allowing safe operation. This entails the design of a new security concept by planning and retrofitting/upgrading the systems in order to delay, absorb and re-adapt the vulnerable yet indispensable digital layer.

The challenges identified as important to the decision-makers in the energy sector are as follows:

- Investments in advanced infrastructure: the use and integration of modern and adaptable technologies, such as advanced systems for the detection and prevention of attacks, strong authentication mechanisms and security solutions, as well as the use of artificial intelligence in the cybersecurity domain, increase readiness and improve the flexibility of energy systems in facing cybernetic threats.
- Lack of cooperation among sectors and institutions: effective defence against cyberattacks demands close cooperation by the energy sector, government agencies, regulatory bodies, information security experts and other institutions. A lack of intersectoral cooperation can impede the exchange of information about threats and the sharing of experiences and best practices, as well as hinder the joint efforts towards increased cybersecurity.
- The need for more extensive intersectoral and interinstitutional cooperation: the goal is to establish an effective and distributed common defence against cyberattacks, which requires close cooperation and long-term planning on the part of the energy sector, the competent national authorities and agencies, regulatory bodies, information security experts and other institutions. Intersectoral cooperation is recommended, as it is needed in order to foster the exchange of information about risks/threats and the sharing of experiences and best practices, as well as to promote joint efforts to strengthen, where possible, cybersecurity in a more systemic and sustainable way, through solidarity.
- The rapidly evolving cybernetic landscape: technological progress and the development of new devices and systems bring novel security challenges. The Internet of Things (IoT), smart grids and other advanced technologies can potentially present a larger attack surface that needs to be secured/defended. Real-time monitoring, adaptation and the timely introduction of security solutions in the constantly shifting cyber environment are key to ensuring cybersecurity in the energy sector.
- Awareness and competencies: It is vitally important to ensure that energy sector employees have an adequate level of knowledge and awareness about cyber threats and best practices for attack prevention. Education, complemented by regular training, awareness-raising campaigns and comprehensible and in-depth cyber exercises is key to improving cyber resilience. Developing and carrying out specialised educational programmes will increase risk awareness, enable an understanding of best practices and improve the ability to respond effectively to cyberattacks.
- Strengthening cooperation among/with security experts: Dedicated investments in cybersecurity can also include the establishment of private/public partnerships with leading security experts in order to support companies in the energy sector. Cooperation with external experts will enable us to keep existing knowledge up-to-date, monitor trends and implement innovative and effective cybersecurity practices.
- Internal organisation improvements: in order to achieve greater synergy in the area of ensuring integral security (including cybersecurity) in terms of human resources and other available potentials, it is useful to improve internal organisation by effectively integrating and deploying human resources.

Network Charge for the Electricity Transmission and Distribution System

Network Charge Determination

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

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

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

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

2019–2021 Regulatory Period

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

In 2022, on the basis of the criteria set out in the Act, the electricity system operators converted the planned eligible costs from 2021 – the last year of the 2019–2021 regulatory period – into costs recognised by regulation. The Energy Agency verified the conversion process and issued special decisions. The Energy Agency also calculated the realised eligible costs using the accounting records of the electricity system operators and electricity distribution companies.

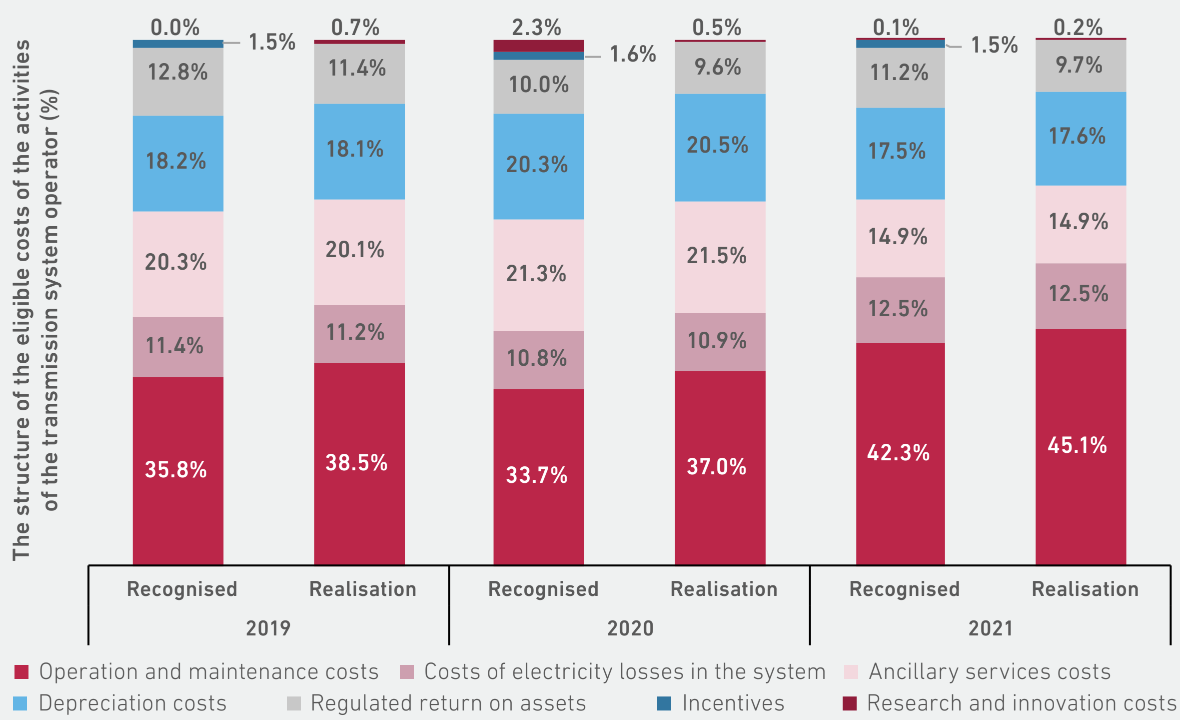
Within the 2019–2021 regulatory period, the year 2020 needs to be pointed out. That year, within the context of the measures for the mitigation of the social and economic consequences of the COVID-19 epidemic, the Energy Agency passed an emergency measure exempting household and small business consumers from paying the billed capacity tariff in the period from 1 March to 31 May 2020. In addition, as stipulated by a provision of the Act Determining the Intervention Measures to Contain the COVID-19 Epidemic and Mitigate its Consequences for Citizens and the Economy, the return on investments for 2020 was determined on the basis of a return on equity of 4.13% instead of by taking the weighted average cost of capital of 5.26%. This is also reflected in the structure of the eligible costs of the transmission system operator (ELES) and the distribution system operator (EDC), since the share of the recognised return on investments within the total recognised eligible costs in 2020 is lower than in 2019 and 2021 (Figures 70 and 71).

Comparing the structure of the transmission system operator's recognised eligible costs in the individual years of the 2019–2021 regulatory period (Figure 70) shows that in 2021, compared to 2019 and 2020, the eligible cost structure changed. The eligible costs thus show an increased share of operation and maintenance costs and the costs of electricity losses in the system, while the share of ancillary services costs decreased. The recognised costs of operation and maintenance in 2021 are markedly higher than in 2019 and 2020 when it comes to the cost of electricity for system balancing. In the revised yearly report for 2021, ELES clarified that this is a consequence of a greater quantity of balancing energy, as well as the general price increases in the electricity market. The higher electricity costs likewise account for the increase in the costs of electricity losses in the system.

Comparing the structure of the recognised and realised eligible costs (Figure 70) of the transmission system operator shows that in all the years of the 2019–2021 regulatory period, significant differences in the operation and maintenance costs and regulated return on assets are apparent. In 2021, as in 2019 and 2020, the share of the realised operation and maintenance costs in the total realised eligible costs was higher than in the recognised eligible costs. This means that in the 2019–2021 regulatory framework, in terms of operation and maintenance costs, the transmission system operator operated in a cost-inefficient way and consequently realised a regulated return lower than that recognised by regulation.

Other than business performance, the actual regulated return on assets is affected by incentives, other revenues, and the recording of network charge surpluses and deficits in the account books.

FIGURE 70: THE STRUCTURE OF THE ELIGIBLE COSTS OF THE ACTIVITIES OF THE TRANSMISSION SYSTEM OPERATOR IN THE 2019–2021 REGULATORY PERIOD

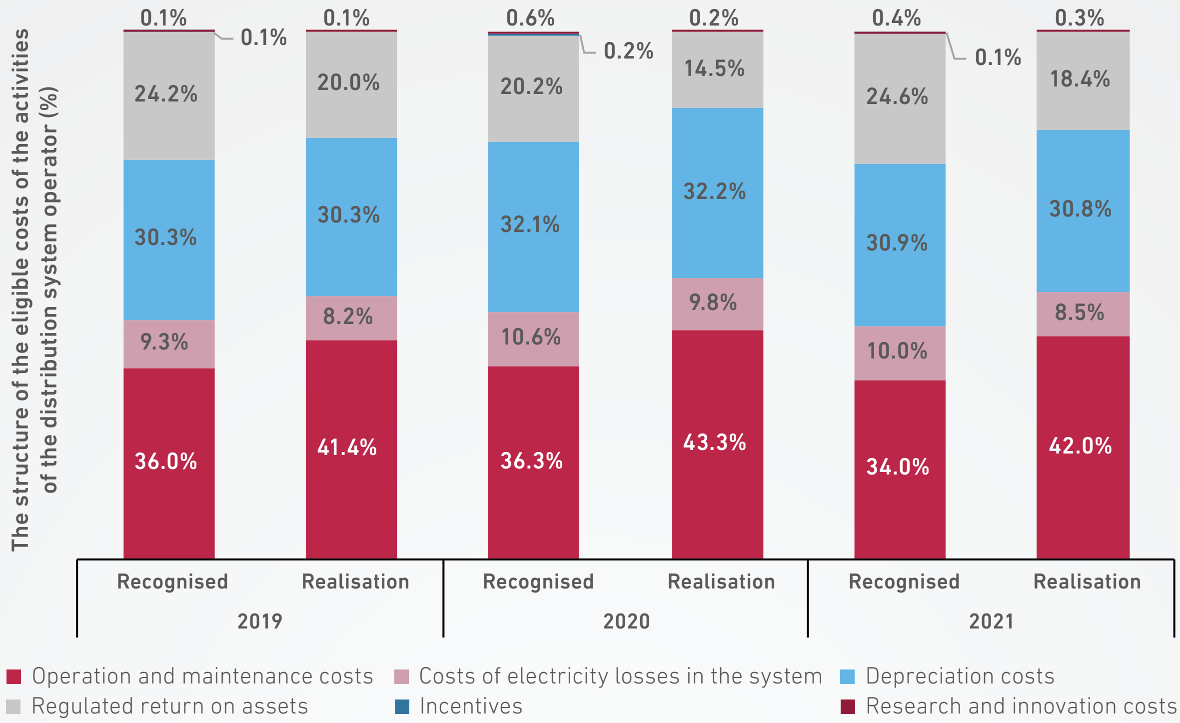


SOURCE: ENERGY AGENCY

Figure 71 shows the structure of eligible costs for the DSO's activity, with the costs calculated as the sum of eligible costs of EDCs and the distribution system operator. Comparing the structure of the recognised and realised eligible costs in individual years of the 2019–2021 regulatory period shows that the distribution operator's activity in the area of operation and maintenance costs was likewise cost-inefficient, a fact reflected in the realised regulated return lower than that recognised by the regulation.

Other than business performance, the actual regulated return on assets is affected by incentives, other revenues, and the recording of network charge surpluses and deficits in the account books.

FIGURE 71: THE STRUCTURE OF THE ELIGIBLE COSTS OF THE ACTIVITIES OF THE DISTRIBUTION SYSTEM OPERATOR IN THE 2019–2021 REGULATORY PERIOD



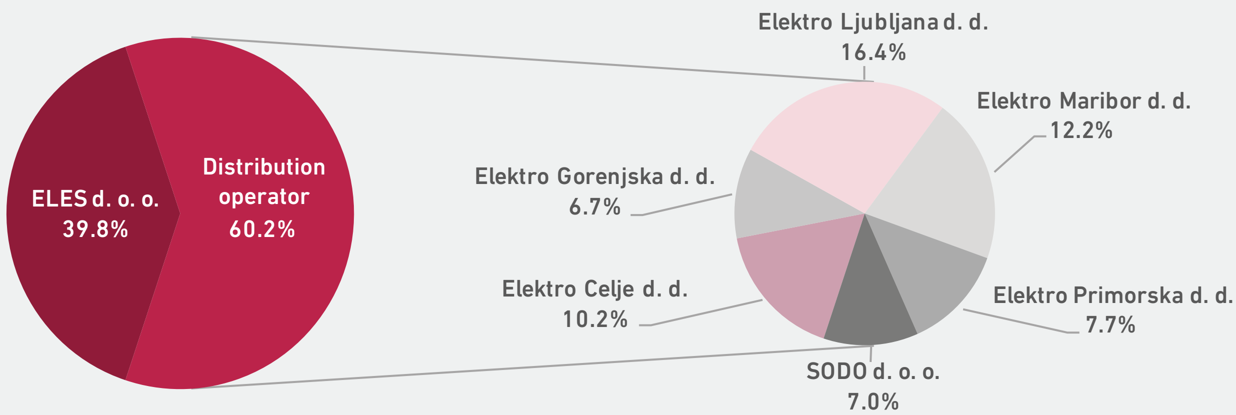
SOURCE: ENERGY AGENCY

The 2022 Regulatory Period

1 January 2022 marked the beginning of a one-year regulatory period that ran until 31 December 2022. In 2021, the Energy Agency issued the Legal Act on the Methodology for Determining the Regulatory Framework and Network Charges for the Electricity Distribution System. In 2021, on the basis of this Act, it set the regulatory framework for the transmission and distribution system operators for the period from 1 January 2022 to 31 December 2022 through two decisions in which it also set the network charge tariffs.

For the single-year regulatory period in question, the Energy Agency set the planned eligible costs for the activity of the transmission system operator at EUR 198 million, an increase of 12.2% compared to 2021, and those for the activity of the distribution system operator at EUR 299.7 million, an increase of 5.5% compared to 2021. Figure 72 shows the structure of the planned eligible costs in 2022 for each of the companies.

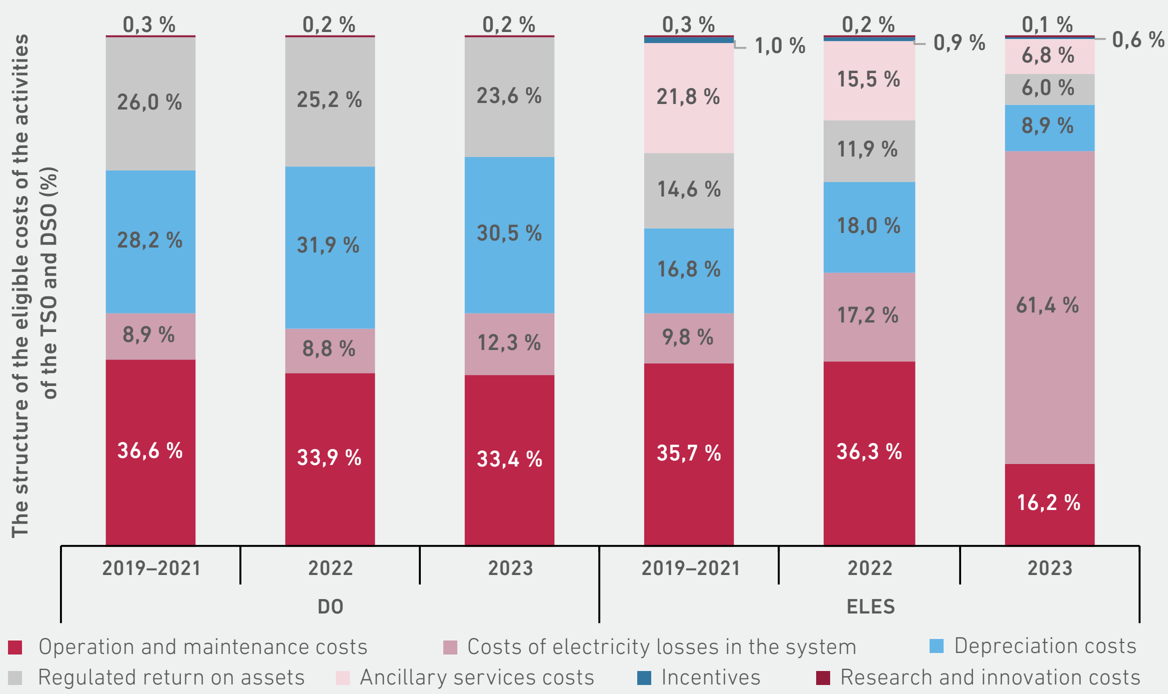
FIGURE 72: THE STRUCTURE OF THE PLANNED ELIGIBLE COSTS OF THE ACTIVITIES OF THE TRANSMISSION AND DISTRIBUTION OPERATOR FOR 2022



SOURCE: ENERGY AGENCY

The structure of planned eligible costs for the 2022 Regulatory Period (Figure 73) shows no significant differences with respect to the previous years of the 2019–2021 regulatory period in terms of the distribution system operator's activities, since the electricity for covering system losses was purchased before the wholesale market prices began to increase. By contrast, the high costs of electricity for covering system losses are already reflected in the structure of the planned eligible costs of the transmission system operator's activities, with the associated impact on higher eligible costs. In both activities, the operational and maintenance costs represent the bulk of the planned eligible costs.

FIGURE 73: THE STRUCTURE OF THE PLANNED ELIGIBLE COSTS OF THE ACTIVITIES OF THE TRANSMISSION AND DISTRIBUTION OPERATOR FOR THE 2019–2023 PERIOD



SOURCE: ENERGY AGENCY

For 2022, EUR 96.4 million of the transmission system operator's eligible costs were planned to be covered by the network charge, EUR 78.1 million by other revenues and EUR 23.5 million by the network charge surplus from previous years. In 2022, EUR 71.3 million in network charges was billed to cover the eligible costs of the transmission system operator, or 26% less than the planned amount.

EUR 94 million less revenue for the electricity system operators due to the State's intervention measure – a 3-month network charge exemption for all consumers in Slovenia

The plan was to cover the distribution system operator's eligible costs in 2022 by the network charge (EUR 284.7 million), with other revenues contributing EUR 15 million. In addition, the plan for 2022 entailed covering the EUR 3.9 million network charge deficit from the previous years. In 2022, EUR 219.3 million in network charges was billed to cover the eligible costs of the distribution system operator, or 24% less than the planned amount.

In 2022, less was billed in network charges than planned as a result of the network charge exemption, since in the period from 1 February to 30 April 2022, the network charge tariff rates in the distribution and transmission system for final consumers in all consumer groups were reduced to zero on the basis of the Act Determining Emergency Measures to Mitigate the Consequences of the Impact of High Energy Commodity Prices. As a result, EUR 94 million in network charges were not billed during that period, with the network charge for the distribution system accounting for EUR 70 million and the network charge for the transmission system EUR 24 million. The network charge deficit resulting from the exemption for the distribution and transmission system was covered through a reduction in the recognised return on investments.

The 2023 Regulatory Period

In 2022, the Agency passed the Legal Act on the methodology determining the regulatory framework and network charge for the electricity distribution system for the regulatory period from 1 January 2023 to 31 December 2023 and for the regulatory period from 1 January 2024 to 31 December 2028. In 2022, on the basis of this Act, the Energy Agency set the regulatory framework for both electricity system operators for the period from 1 January 2023 to 31 December 2023 through two decisions in which it also set the network charge tariffs. For the period in question the Energy Agency set the planned eligible costs for the transmission system operator at EUR 397 million, an increase of 100.5% 2022, and those for the distribution system operator at EUR 312.2 million, an increase of 4.18% compared to 2022.

42.5% higher planned eligible costs of the activities of the system and the distribution operator in 2023 with respect

The structure of the planned eligible costs of the transmission system operator (Figure 73) is significantly different to the previous years as a result of the high costs of the electricity for covering system losses. The high costs of the electricity for covering system losses are a result of the high electricity costs and the coverage, in part, of these costs for the distribution system as well.

Taking into account the planned eligible costs in 2023, the tariff rate for the eligible income from transmission charges in 2023 compared to 2022 should increase by 109.7% and the one for the distribution charges by 4%. Due to the energy crisis and the associated high costs of electricity, the Act Regulating the Emergency Intervention to Address High Energy Prices (ZNPOVCE) stipulated that the tariff rates for the network charge in 2023 remain unchanged from 2022 and that the surplus congestion income from 2022 and 2023 be used to cover the eligible costs of the transmission and distribution system. Even taking into account the above, a network charge deficit of EUR 116.9 million is projected at the level of the transmission and distribution system activity as a whole. The ZNPOVCE furthermore stipulated that if the surplus congestion income from 2022 and 2023 turns out to be insufficient to cover all the planned eligible costs, surplus market revenues or other appropriate resources may also be used for these purposes. This ensured that any network charge deficit in 2023 resulting from maintaining the network charge tariff rates at 2022 levels would not be taken into account in the determination of the network charge tariff rates after 1 January 2024.

Any identified network charge deficit in 2023 will not be taken into account in the determination of the network charge tariff rates after 1 January 2024.

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 system operator that are funded from the network charge, the Energy Agency determines network charge tariffs for individual consumer groups. The tariffs are divided into:

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

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

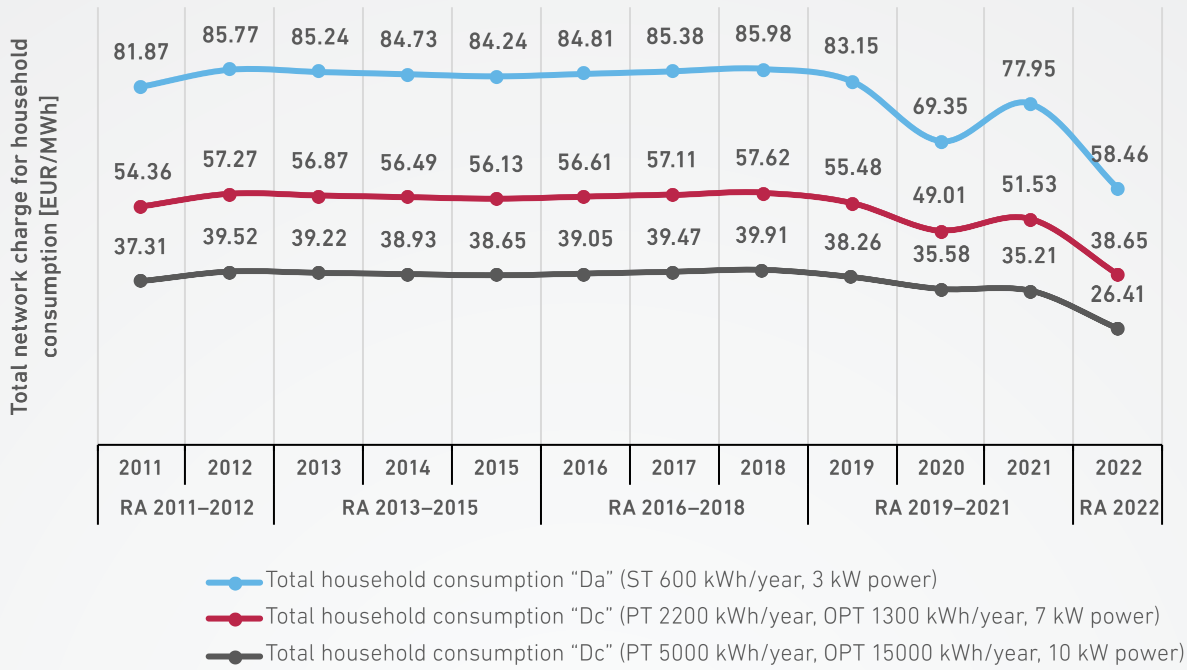
- High daily tariffs during high tariff time, charged from Monday through Friday from 06:00 to 22:00, and
- low daily tariffs during off-peak time, charged in the remaining week hours and Saturdays, Sundays and public holidays (all day), or
- single daily tariffs, charged every day all day.

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

Figures 74 and 75 show the fluctuation of the total network charge for the transmission and distribution systems per year of regulatory periods for some typical household and business consumers, defined by standard consumer groups.

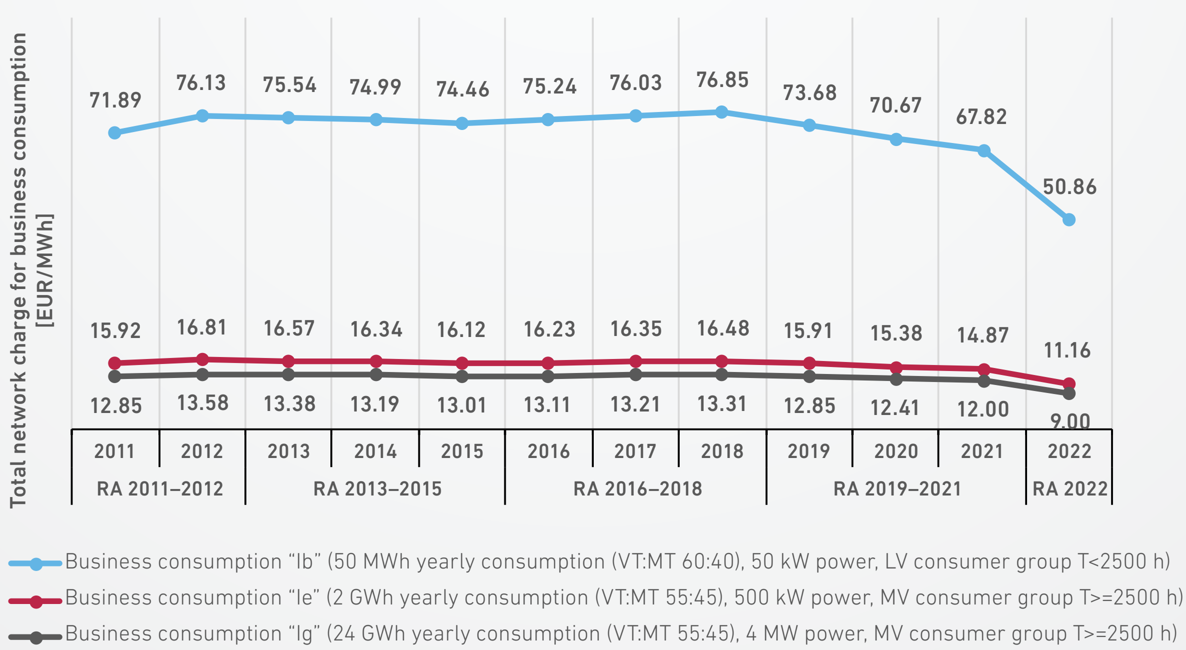
There was a noticeable fluctuation in the network charge for household consumption in the period from 1 March to 31 May 2020, when household and small business consumers were exempt from paying the billed capacity tariff due to the Energy Agency passing the emergency measure for the mitigation of the social and economic consequences of the COVID-19 epidemic, as can be seen in Figure 74. In 2022, a similar measure was implemented by the Government of the Republic of Slovenia. With this measure, all tariffs for the billed capacity and the effective energy received for all consumer groups were reduced to zero for both electricity system operators from 1 February to 30 April 2022. As a result of that measure, there was a shortfall of EUR 70 million in billed network charges for the distribution system and EUR 24 million for the transmission system, representing a nearly 27% shortfall of planned network charges in 2022.

FIGURE 74: FLUCTUATION OF THE TOTAL NETWORK CHARGE FOR THE TRANSMISSION AND DISTRIBUTION SYSTEMS FOR SOME TYPICAL HOUSEHOLD CONSUMERS PER REGULATORY PERIOD



SOURCE: ENERGY AGENCY

FIGURE 75: FLUCTUATION OF THE TOTAL NETWORK CHARGE FOR THE TRANSMISSION AND DISTRIBUTION SYSTEMS FOR SOME TYPICAL BUSINESS CONSUMERS PER REGULATORY PERIOD



SOURCE: ENERGY AGENCY

Allocation and Use of Cross-Zonal Transmission Capacities

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 CZCs, 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 time 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 400 kV transmission line Cirkovce-Héviz 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 important 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 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.

The introduction of transmission capacity allocation based on power flows and the establishment of a direct transmission link with Hungary

This means that in 2022, day-ahead CZC allocation at all Slovenian borders took place in the context of the 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 Agency as the Nominated Electricity Market Operator (IOTEE) for the Slovenian trading area in 2019 for a period of four years on the basis of 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 actually being used are transferred to day-ahead allocation, whereby holders of the 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. In the role of the common European auction platform at all Slovenian borders was the Joint Allocation Office (JAO) headquartered in Luxembourg. All annual and monthly auctions at the Slovenian borders were conducted in accordance with the 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. This means that only the realised revenue at individual borders and in the virtual area can be shown. These revenues are shown in Figure 24, where the virtual zone is called the »slack zone«. Revenues are given 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 24: REALISED REVENUE IN 2022 AT EACH BORDER

Border	Gross approach [EUR]	Net approach [EUR]
Austria	61,398,096	26,342,627
Croatia	13,308,371	2,950,600
Italy	96,374,966	44,623,167
Hungary	7,052,502	3,321,665
Slack Zone	37,259,046	37,259,046
Total	215,392,980	114,497,105

SOURCE: ELES

Table 24 shows that a large part of the revenue is realised within the virtual area. This is a consequence of the fact that a considerable portion of the power flows between Slovenia and the bidding zones in the Core region is transmitted through the Italy and Swiss bidding zones, which are not part of the region. We can also observe a significant increase in revenues from the allocation of CZCs, which can be attributed to the significant price increase on European markets in 2022. Per the net approach, these revenues have increased from just under EUR 41 million in 2021 to almost EUR 114.5 million.

Promoting Competition

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

Wholesale Market

Producers, traders and suppliers of electricity exchange electricity in the wholesale market. This exchange can take place in organised trading venues (exchanges) or bilaterally (OTC – Over The Counter). The connections of the Slovenian energy network with foreign networks enable the participants in the Slovenian bidding zone to exchange energy with foreign bidding zones. If participants transmit energy from the Slovenian bidding zone, we talk about export, if they feed it, about import. The free flow of energy within the available transmission capacities means that the market conditions of one bidding zone transfer to the other bidding zones. So it does not make sense to monitor only the national wholesale market. Monitoring should be conceived in a broader sense and follow the price trends not only in the Slovenian bidding zone but also in the region.

Electricity Prices

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

The Slovenian electricity market is situated at the juncture of four large European markets: the German, Austrian and Italian markets and that of South-Eastern Europe. The Slovenian market is part of the interregional day-ahead market coupling at the borders with Austria, Italy, Croatia and Hungary. As regards intraday coupling, the Slovenian electricity exchange joined the European single intraday market on its borders with the neighbouring countries as of 2022.

The day-ahead markets saw record prices

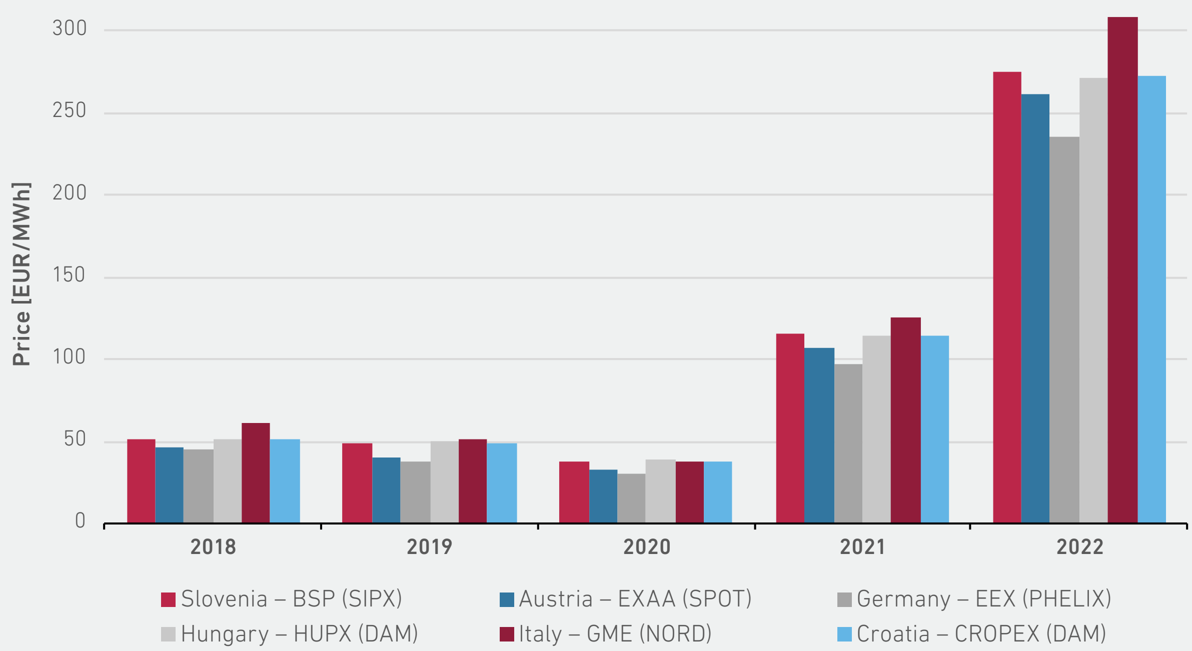
Figure 76 shows trends in average base prices on power exchanges in Slovenia, its neighbouring countries, and in Germany in the last five years. In 2022, the prices on the power exchange in Slovenia were most comparable with the prices in Hungary and Croatia.

In 2022, the average base price on the power exchange in Slovenia increased by 139% compared to 2021, thus amounting to 274.47 EUR/MWh, which is historically the highest average annual amount. As seen from Figure 76, electricity price growth was recorded on all the observed markets.

The biggest price growth was recorded on the Italian market GME (NORD), where the prices increased by 146%. In addition, the Italian market saw the highest average price (307.82 EUR/MWh) in the day-ahead market in 2022.

Once again, the lowest average base price (235.46 EUR/MWh) out of all the compared prices was recorded on the German power exchange, where the average prices also rose by 143% compared to 2021. The average prices in Austria are slightly higher. Due to electricity liquidity, the prices on the German power exchanges affect other EU markets.

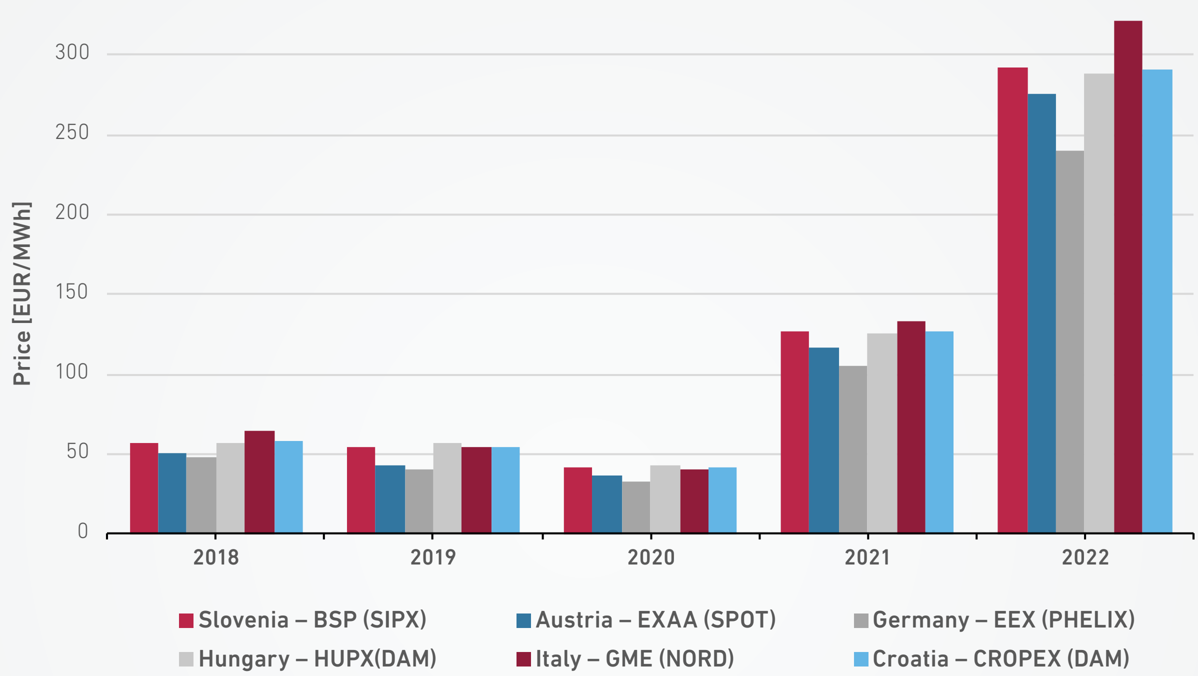
FIGURE 76: TRENDS IN THE AVERAGE BASE PRICE IN THE DAY-AHEAD MARKET IN SLOVENIA AND IN FOREIGN EXCHANGES IN THE 2018–2022 PERIOD



SOURCE: MONTEL

The trends in the average peak price in individual day-ahead markets are shown in Figure 77. In 2022, the average peak price on the power exchange in Slovenia increased by 130% compared to the average price in 2021, thus amounting to 291.79 EUR/MWh. Similarly to the base prices, peak prices increased compared to 2021 in all markets under observation, with the biggest rise in prices recorded on the Italian market (140%). The lowest price increase was recorded on the German market (128%). Out of all the observed markets, the Italian GME (NORD) reached the highest average peak price in 2022, which was 320.99 EUR/MWh.

FIGURE 77: TRENDS IN THE AVERAGE PEAK PRICE IN THE DAY-AHEAD MARKET IN SLOVENIA AND ON NEIGHBOURING EXCHANGES IN THE 2018–2022 PERIOD



SOURCE: MONTEL

Until the first third of March, wholesale-market electricity prices on continuous markets experienced a predominantly upward trend, characteristic of the second part of 2021. After that the prices slightly decreased until early June. June saw a new increase in prices, though the outstanding price peak from March was not exceeded. The significant growth of the electricity price in March was due to the uncertainty brought about by the tense geopolitical situation and concerns regarding sufficient energy supply. Uncertainty on the energy market also prompted the price increase in June when the natural gas supply through the gas transmission network from Russia to Europe significantly decreased and poor hydrological conditions marked parts of the continent. After that, the wholesale-market electricity prices mostly increased until 29 August. From then on, the period until early November was market by a gradual decrease in prices. Until mid-December, there was a new short-term period of price increase, followed by a period of a mostly downward trend that lasted until the end of the year. The price increase at the end of August was due to the announcement regarding Gazprom's intended cessation of natural gas supply to Europe through Nord Stream 1. This announcement brought uncertainly regarding energy supply security, which was reflected in considerable fluctuations and soaring prices. The period that followed proved that Europe has been successful at replacing the reduced import of Russian gas through gas pipelines. The sufficient energy supply in Europe has eased the pressure on energy wholesale prices, which led to a gradual decrease in prices. At the beginning of November, an increase in demand for electricity due to low temperatures coinciding with the start of the heating season caused a new increase in the wholesale prices. On the other hand, a drop in wholesale electricity prices in the second part of December was mainly a consequence of above-average temperatures, reflecting in a decrease in demand due to temperatures, and reduced industrial consumption during the Christmas holidays.

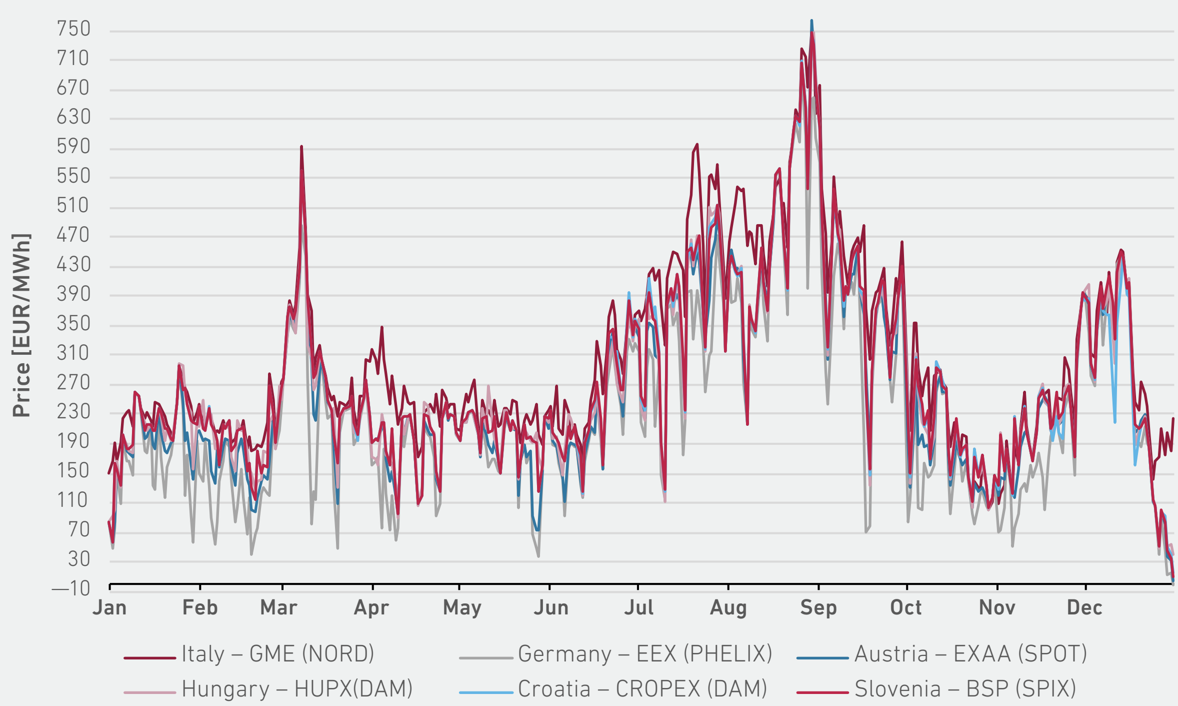
According to the Ministry of the Environment, Climate and Energy in 2022, electricity sales to final consumers decreased by around 2.9%. The sales have dropped both in the segment of business consumers (2.3%) and household consumers (4.8%). In 2022, the base prices in Slovenia were the lowest in the second quarter, when the average base price was 213.33 EUR/MWh. Germany saw the lowest prices in the first quarter, when the average base price was 184.62 EUR/MWh. During the year, the prices in Europe peaked in the third quarter. In that time, the average base price in Slovenia was 421.77 EUR/MWh, while in Germany it was 375.75 EUR/MWh.

In 2022, the highest base prices on the day-ahead power exchanges were recorded in August, when the daily base price on the Slovenian exchange reached the absolute top on 29 August 2022 with 747.987 EUR/MWh. The highest hourly price was recorded the next day, on 29 August, when it reached 879.29 EUR/MWh between 19:00 and 20:00. As already mentioned, the extraordinary price levels at the end of August were due to the announcement regarding Gazprom's intended cessation of natural gas supply to Europe through Nord Stream 1.

Defining (arbitrarily) the price peaks as exceeding three times the amount of the average hourly rates, Slovenia saw the exceeding of price peaks in 13 cases, which is around 91% less compared to 2021. The decrease in the number of price peaks is a consequence of the relatively high average price of electricity since three times the amount of these prices raised the price peak threshold to a relatively high level.

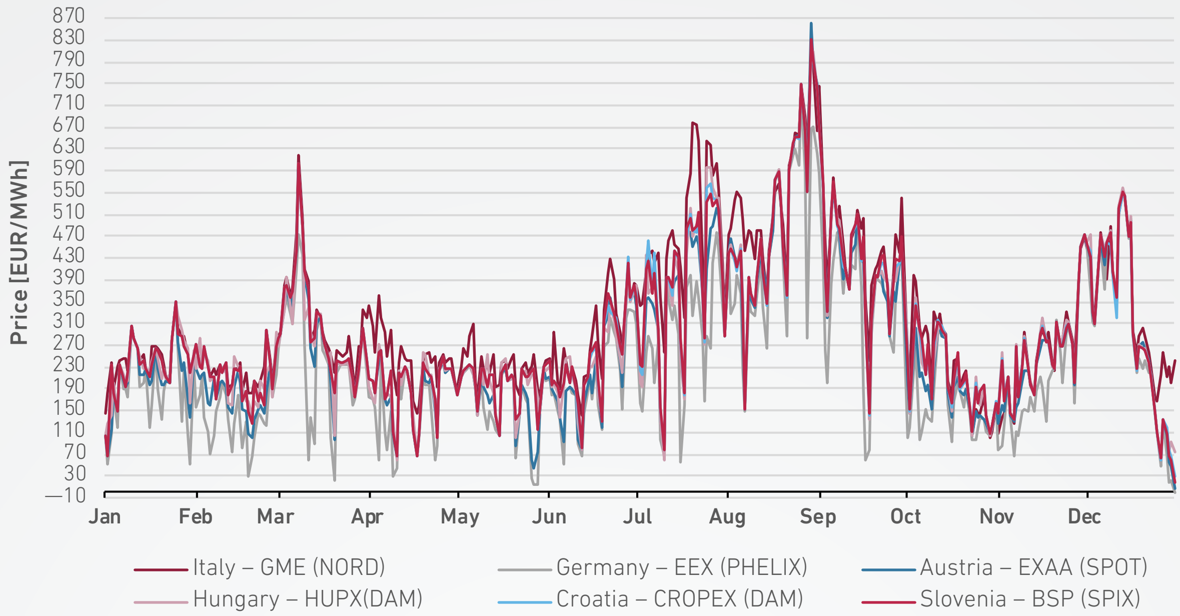
In 2022, we did not record negative hourly prices on the Slovenian power exchange, while in 2021 negative prices were recorded in 23 hours. Reduced incidence of negative prices was also recorded on the German market, where the prices were negative for 69 hours, while in 2021 they recorded 139 hours with negative prices.

FIGURE 78: TRENDS IN THE BASE PRICE ON THE DAY-AHEAD MARKET IN SLOVENIA AND ON THE NEIGHBOURING EXCHANGES



SOURCE: MONTEL

FIGURE 79: TRENDS IN THE PEAK PRICE ON THE DAY-AHEAD MARKET IN SLOVENIA AND ON THE NEIGHBOURING EXCHANGES



SOURCE: MONTEL

Table 25 shows the results of a comparative analysis of the prices that were reached on the day-ahead market on the BSP (Slovenia), GME (Italy), EXAA (Austria), CROPEX (Croatia) and HUPX (Hungary) exchanges in 2021 and 2022. The difference between electricity prices has decreased as Slovenian and Hungarian markets coupled[54], as greater comparability between BSP and HUPX markets can be observed. Compared to the previous year, the share of hours in 2022 when the prices on the Austrian exchange (EXAA) were the same as those on the BSP also increased. On the other hand, the share of hours when the prices on the Italian (GME) and Croatian (CROPEX) exchange were the same as on the BSP, decreased in 2022 compared to the year before.

TABLE 25: COMPARISON OF PRICES (ACCORDING TO THE SHARE OF HOURS) BETWEEN POWER EXCHANGES ON THE DAY-AHEAD MARKET

	Share of hours in 2021	Share of hours in 2022[55]
Lower price in BSP than GME	51.5%	62.6%
Lower price in GME than BSP	3.5%	9.0%
Same price in BSP and GME	44.9%	28.4%
Lower price in BSP than EXAA	24.3%	21.2%
Lower price in EXAA than BSP	54.7%	51.9%
Same price in BSP and EXAA	21.0%	27.0%
Lower price in BSP than CROPEX	5.2%	25.8%
Lower price in CROPEX than BSP	29.1%	34.0%
Same price in BSP and CROPEX	65.6%	40.3%
Lower price in BSP than HUPX	41.6%	32.4%
Lower price in HUPX than BSP	50.7%	42.5%
Same price in BSP and HUPX	7.6%	25.1%

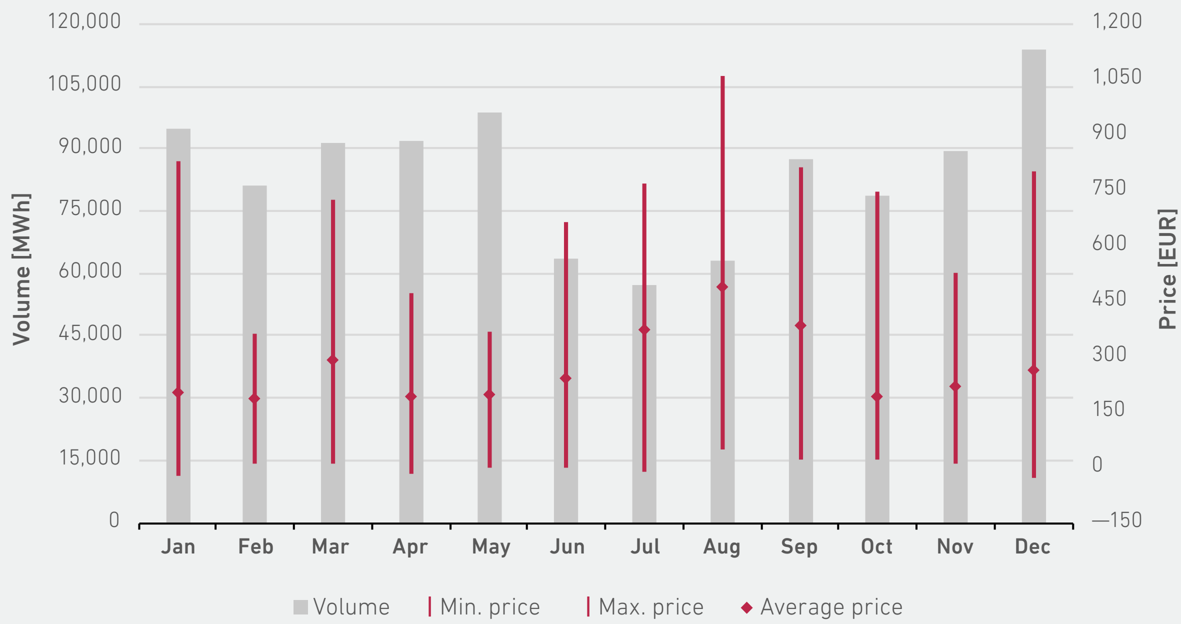
SOURCE: MONTEL

54 The markets on the Slovenian-Hungarian border were officially coupled and integrated on 30 June 2022, while trading kicked-off in early July.
55 The difference between the total and the sums of the individual share of hours is due to rounding to one decimal place.

Prices on the Intraday Continuous Market

Figure 80 shows the trends in the trading quantities and price ranges of all products on the intraday continuous market. In the summer months, there was a broad price range and a decrease in the volume of continuous trading.

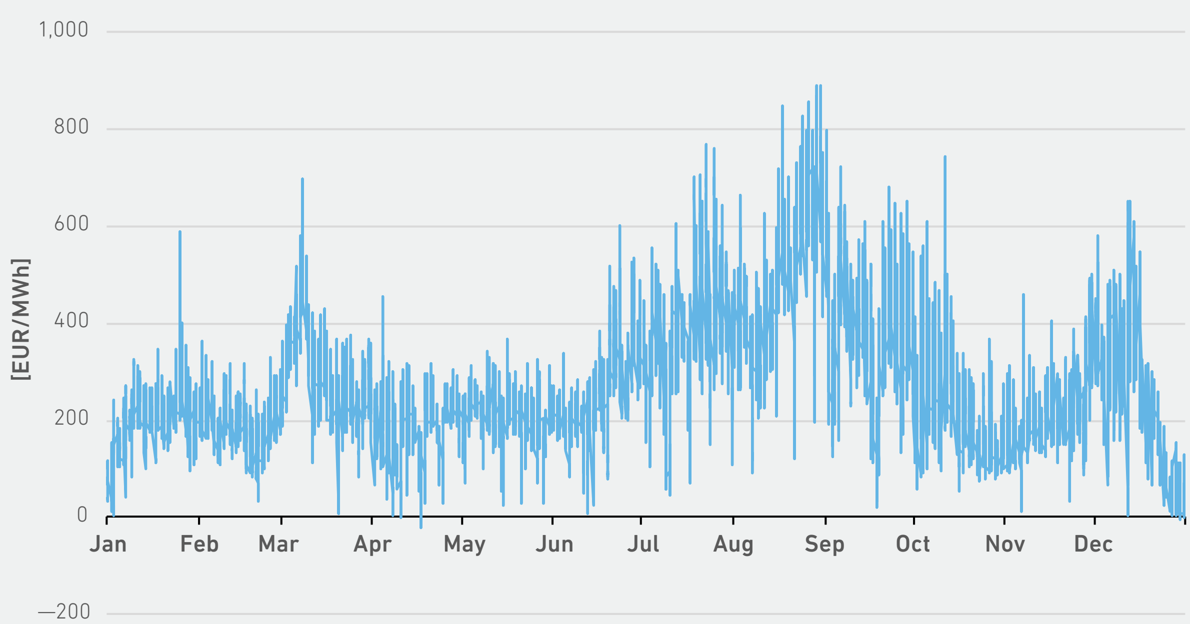
FIGURE 80: VOLUME OF TRADING AND PRICE RANGES IN THE INTRADAY MARKET



SOURCE: BSP

In 2022, the average price of hourly products on the intraday market amounted to 268.84 EUR/MWh, which is almost 2.5 times the price in 2021, when the average price amounted to 111.48 EUR/MWh and seven times the price in 2020, when the average price amounted to 38.05 EUR/MWh.

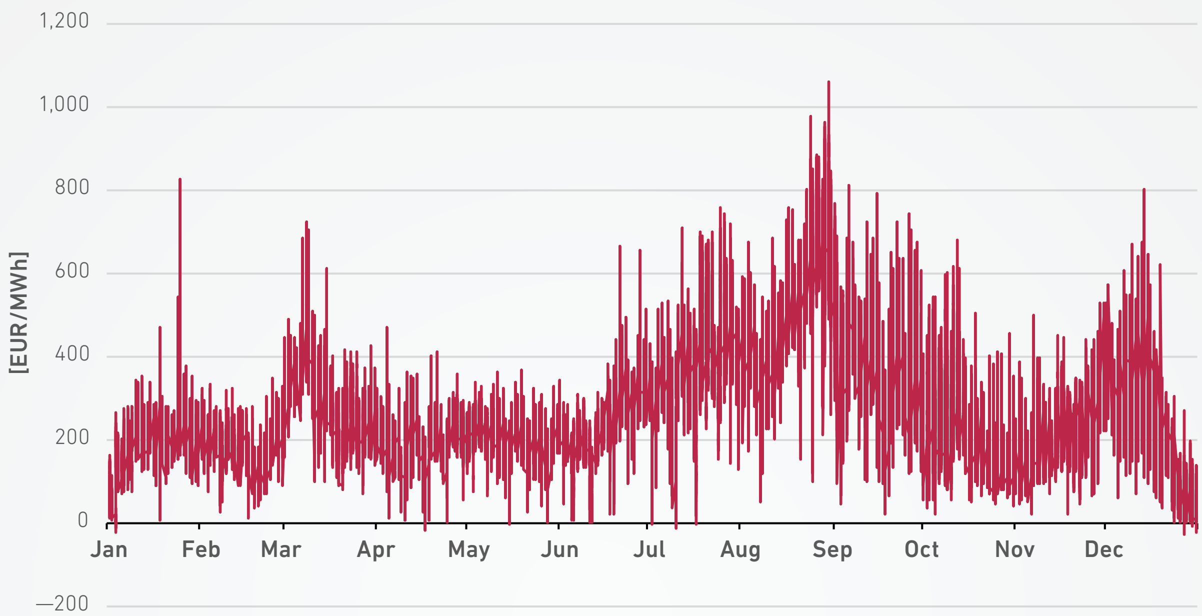
FIGURE 81: DEVELOPMENT OF THE PRICES OF THE HOURLY PRODUCT ON THE BSP INTRADAY MARKET



SOURCE: BSP

In 2022, the average price of 15-minute products on the intraday market amounted to 275.09 EUR/MWh, which is almost 2.5 times the price in 2021, when the average price amounted to 114.08 EUR/MWh and almost eight times the price in 2020, when the average price amounted to 35.48 EUR/MWh.

FIGURE 82: DEVELOPMENT OF PRICES OF THE 15-MINUTES PRODUCT ON THE BSP INTRADAY MARKET

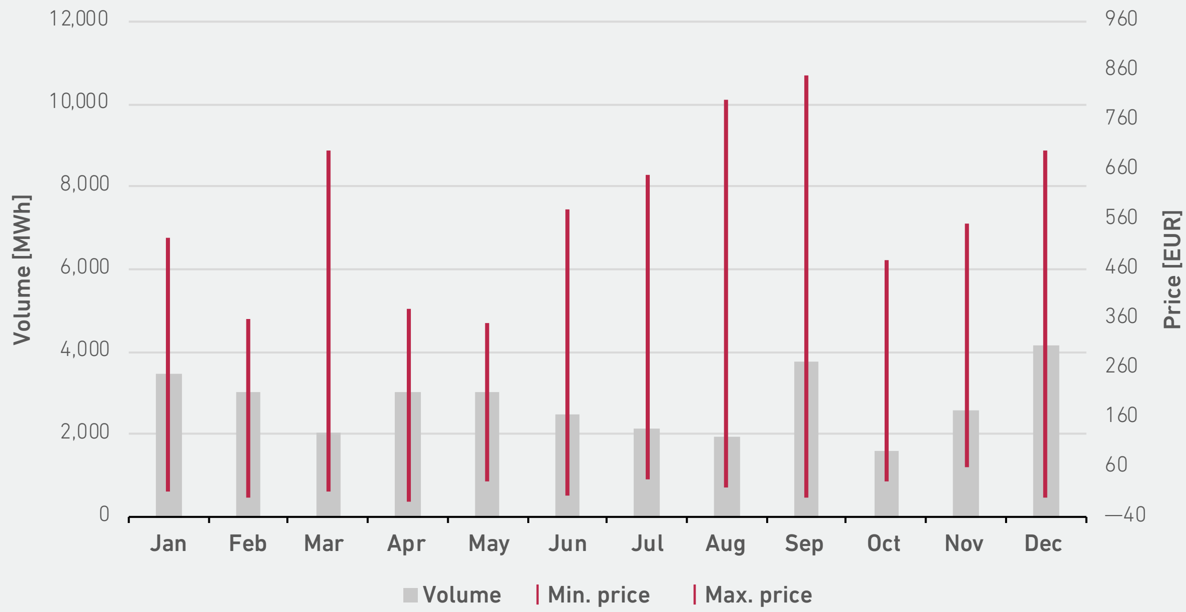


SOURCE: BSP

Energy Prices on Systemic Balancing Markets

The Energy Agency continues to monitor all the organized markets trading with energy for systemic balancing, i.e. the ancillary services market organised by the transmission system operator and the market operator balancing market. The purchase prices of balancing capacity with the object of guaranteeing the availability of units included in the ancillary services market, the unintentional imbalances (Fskar) and imbalance netting (IGCC) are addressed in the Ancillary Services chapter. The following analysis exclusively addresses the prices of balancing energy. In 2022, the highest price of electricity on the market operator balancing market was 850 EUR/MWh and the lowest was –10 EUR/MWh. The highest prices occur when balancing energy is purchased, while the lowest occur when the transmission system operator sells energy surpluses. The highest price was reached in the evening hours of 26 September 2022, though this high price does not correlate with the intraday market prices and the prices in the day-ahead market. In the first half of the year, the TSO mostly sold electricity on the balancing market, while in the second half of the year, the TSO mostly purchased energy.

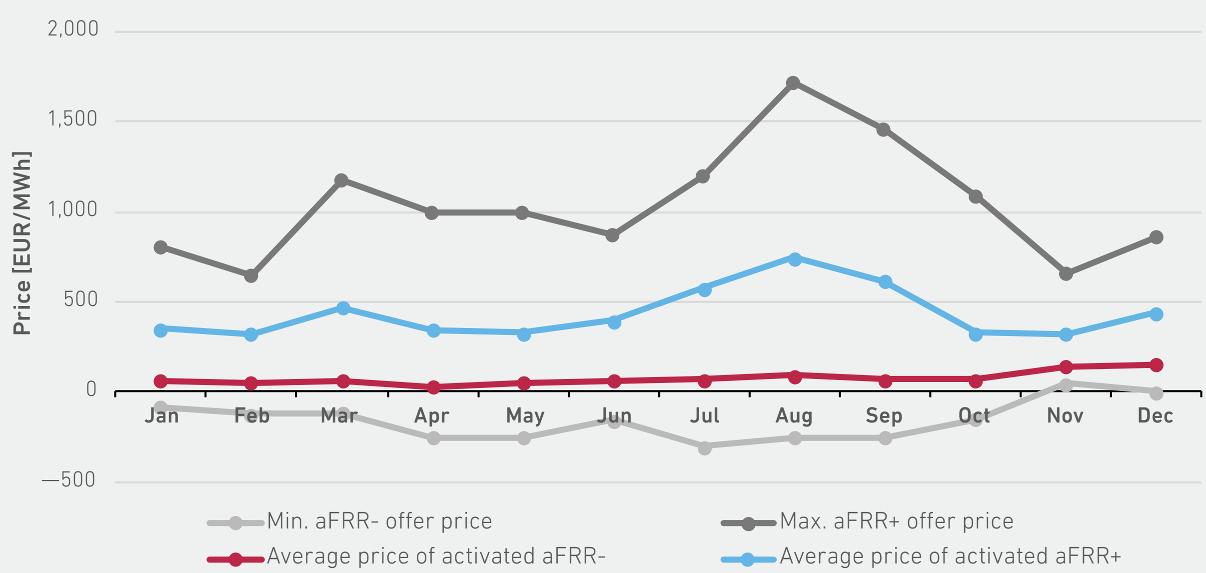
FIGURE 83: VOLUME OF TRADING AND PRICE RANGES IN THE MARKET OPERATOR BALANCING MARKET



SOURCE: BORZEN

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

FIGURE 84: PRICE TRENDS OF OFFERS AND ACTIVATED aFRR ENERGY

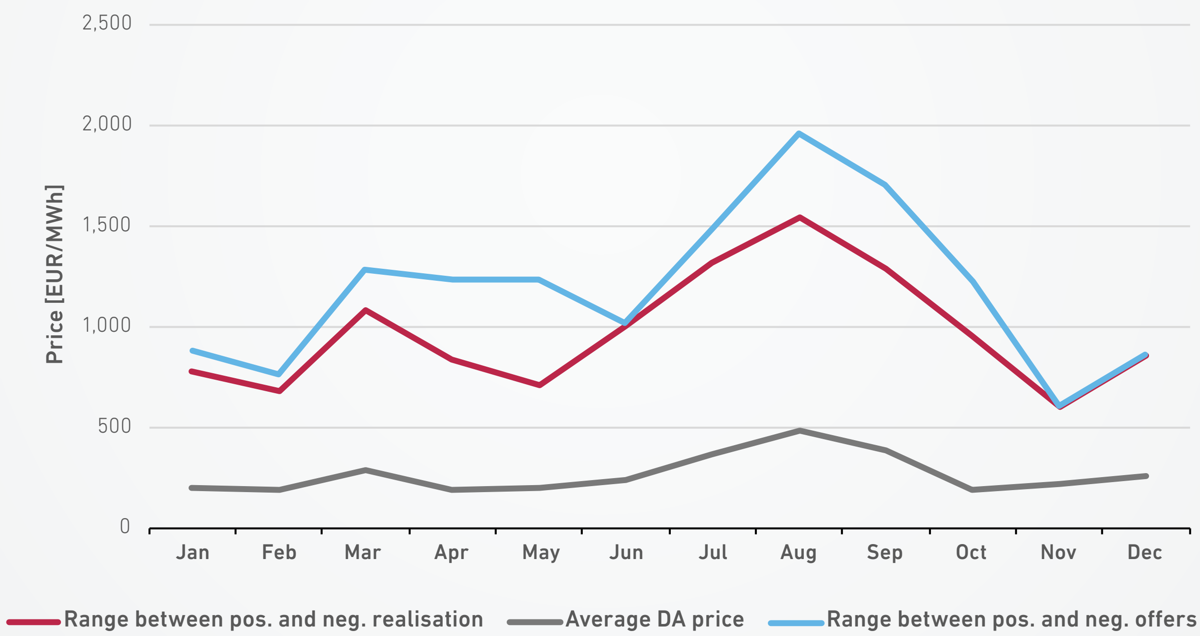


SOURCE: ELES

Figure 84 shows the price trends and activated energies of the aFRR– and aFRR+ reserve for frequency restoration. Due to activations according to the list of offers, the actual prices are more favourable compared to the range of prices shown. The highest prices for the aFRR+ positive balancing were reached in August, when the average price of activated energy amounted to 745.85 EUR/MWh. The lowest and least favourable prices for the aFRR– negative balancing were reached in April, when the average price of activated energy amounted to 32.26 EUR/MWh. The greatest difference between the price for positive and negative balancing was observed in August with the average amount of 656.87 EUR/MWh, which is 1.3 times the wholesale price on the day-ahead market in this period.

Figure 85 shows that there was a decrease in the difference between the price for positive and negative balancing in the period between October and December. In addition, the prices of negative energy became positive. The reason for this is the entry into force of the Act on Measures for the Management of Crisis Conditions in the Field of Energy Supply (ZUOKPOE), which limited the offer prices to 1.3 times the reached price for the day-ahead trading for positive balancing, and 0.7-times the reached price for the day-ahead trading for negative balancing.

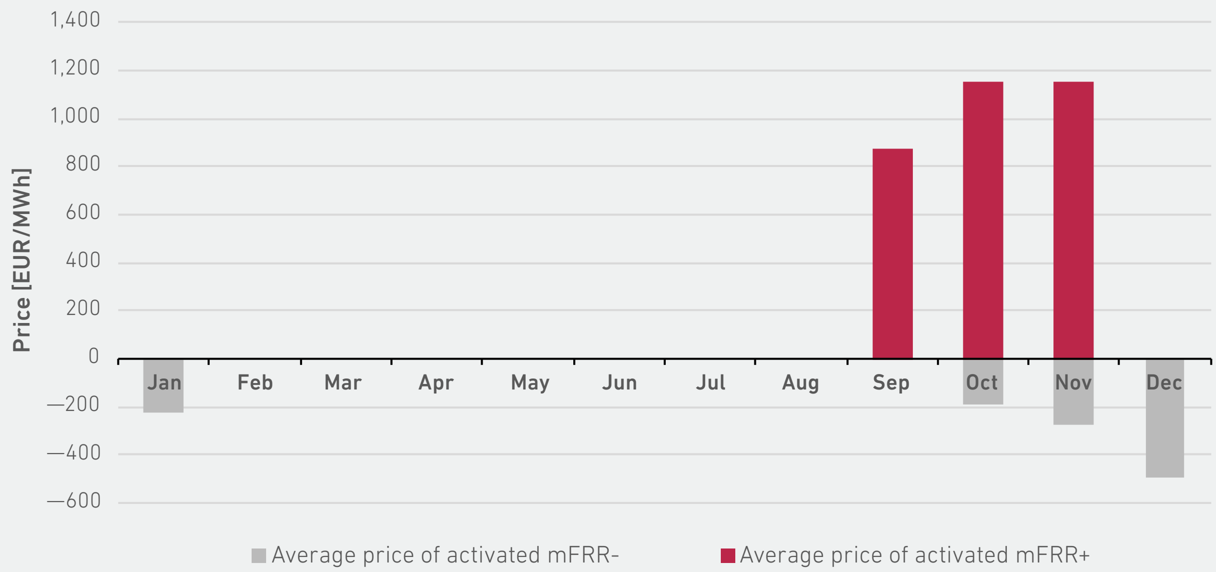
FIGURE 85: THE CORRELATION BETWEEN THE RANGE OF THE MINIMUM PRICE OF THE REALIZED/OFFERED aFRR– AND THE MAXIMUM PRICE OF THE REALIZED/OFFERED aFRR+, AND THE AVERAGE PRICE OF THE DAY-AHEAD TRADING



SOURCE: ELES

With regard to the mFRR+ positive balancing, the average prices of activated energy in 2022 reached 1,058.86 EUR/MWh, while for the mFRR– negative balancing, they amounted to −295.34 EUR/MWh. Figure 86 shows the average prices of activated mFRR– and mFRR+ energy for the months in which the energy was activated. The mFRR+ positive balancing was only activated in September, October and November, while the mFRR- negative balancing was only activated in January, October, November and December.

FIGURE 86: PRICE TRENDS OF ACTIVATED mFRR ENERGY



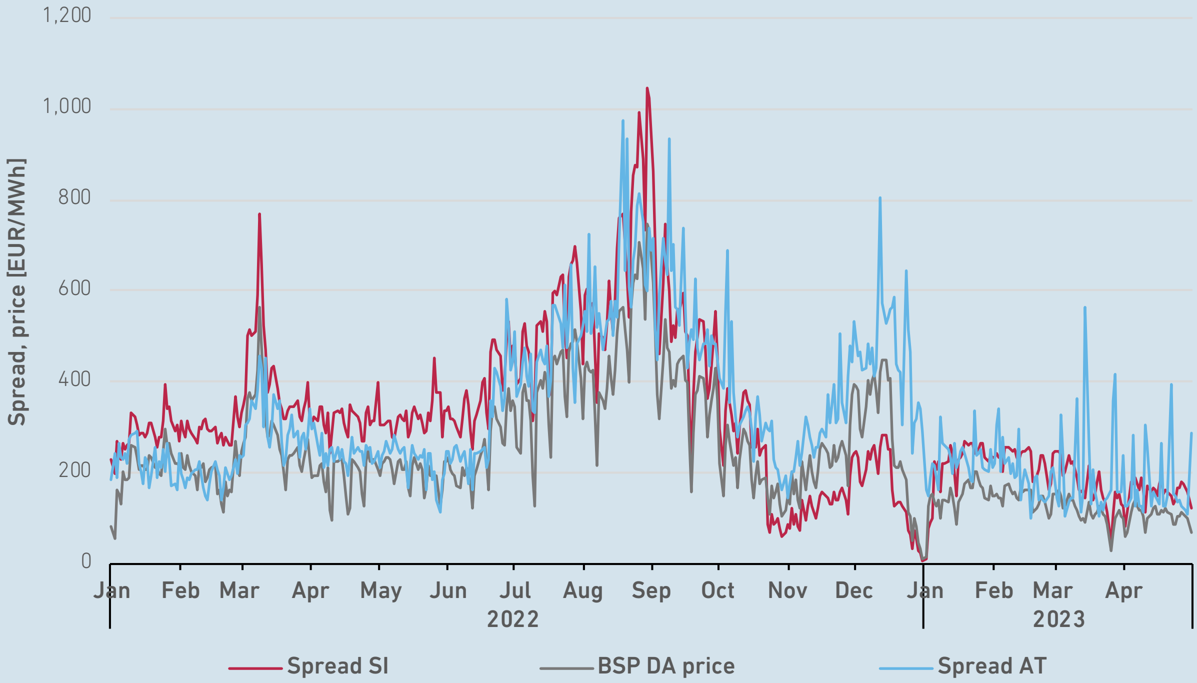
SOURCE: ELES

CASE STUDY
Systemic Services in 2022: Automatic Frequency Restoration Process

2022 still saw only two providers trading in the aFRP process – HSE and NGEN. For comparison: in the Austrian regulation area, the ancillary services market is much more developed. In fact, in 2022, the aFRR service was provided by 14 providers, which is the same as in 2021. The APG transmission system operator in the Austrian regulation area is in charge of +/– 200 MW secondary reserves (also called aFRR). Similarly to Slovenia, the power reserve in Austria is provided through daily auctions, but for every day in six time slots of 4 hours. The providers offer the aFRR+ and aFRR– balancing energy (for positive and negative balancing) in time slots of 15 minutes. The offered quantities of balancing energy are activated according to the merit order list (MOL). The granulation of the lowest offer is 1 MW in a single time slot, as is the case in Slovenia.

Figure 87 shows the difference or the spread between the average recorded prices of aFRR+ and aFRR– balancing energy, which is a good indicator of the price and the costs of secondary regulation. This price is transferred – together with the tertiary mFRR regulation and replacement reserve RR – to balance-responsible parties, depending on their imbalances in individual imbalance settlement periods.

FIGURE 87: AVERAGE DAILY SPREAD ON THE ELES BALANCING MARKET FOR aFRR ENERGY



SOURCES: ELES, APG, ENERGY AGENCY CALCULATION

Since the levels of the aforementioned spread are hard to comment on in absolute values, Figure 87 also shows the trends in the day-ahead exchange prices on the BSP Southpool market. The prices of the positive balancing energy aFRR+ are usually higher compared to the day-ahead prices, while the aFRR– prices are lower. With regard to this, it should be taken into account that in 2022, the prices on our exchange were on average 13 EUR/MWh higher than on the Austrian EXAA exchange.

The spread on Slovenian territory, which is a market that has not yet been coupled in the European aFRR platform PICASSO, the recorded spreads in the first three quarters of 2022 were slightly above the exchange prices, and at least in the first half of the year, also above the Austrian spreads. The situation changed significantly when Austria entered the PICASSO platform on 22 June 2022. Since then, the spreads in Austria have slightly increased, with occasional pronounced peaks. For example, the last pronounced peak with a spread above 500 EUR/MWh, which is a multiple of the exchange price at the time, occurred on 14 March 2023, when the three evening hours saw the prices of the aFRR- balancing energy to be strongly negative, even below –4,000 EUR/MWh. Should the prices and the spread not be averaged on the daily basis, the peaks in Figure 87 would be even more pronounced.

Until 22 October 2022, the difference between the positive and negative regulation price was higher compared to the price on the day-ahead exchange. This changed once the Act on Measures for the Management of Crisis Conditions in the Field of Energy Supply (ZUOKPOE) entered into force, which imposed the transmission system operator to put a price cap on the offer prices. At first, this price cap was very restrictive, though if we look at Figure 87, after the correction of the price cap methodology in the early days of 2023, the spread on most days returns to a level above the exchange price.

Having a positive impact on overall welfare, especially in areas with moderate prices, a coupled market may also have a short-term negative impact on prices, which also appears to be the case with the Austrian coupled market entering the PICASSO platform. Some of the more favourable offer is transferred to the neighbouring markets, while domestic providers gain the possibility of offering their services at higher prices on the new market, compared to the prices before entering the coupled market. Occasional extreme prices as a side effect of the coupled market may also be a source of motivation and opportunity for the entry of new participants into the systemic services market. Other opportunities in this segment of the market include consumption adjustment and aggregation providers. Despite this, the coupled Austrian market recorded no new entries in 2022.

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

The second year in a row with a 60% difference between the average hourly price reached in the BSP and the estimated market price of electricity.

The Energy Agency establishes the estimated market price of electricity produced in power plants that are included in the support scheme. This is done as part of monitoring the effect that this electricity has on the development of the prices of other electricity on the market that does not benefit from financial support for production. That monitoring aspect is particularly important if the share of electricity for which producers are eligible for support is large. This is because it can begin to distort the market prices while placing producers without support in a non-competitive position. The share of generated electricity for which producers can receive support stayed below 10% of all the electricity generated in Slovenia (see Table 12). Although no influence of the support was detected on pricing, the Energy Agency keeps monitoring the market and determining the estimated market price of electricity for which producers are eligible for support.

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

As has been the case for several consecutive years now, in 2022 most of the electricity included in the support scheme was sold freely on the market, so within the framework of operational support. The estimated market price was thus mainly influenced by the weighted price of electricity achieved by the producers by selling the generated electricity to the suppliers on the market. Figure 26 shows the estimated market price of electricity together with the average base price in the BSP for the 2018–2022 period. Similarly to 2021, the latter was around 60% lower compared to the average base price. When electricity purchase prices were determined for 2022, no one could have foreseen the upcoming record-level increases in prices. Due to that, purchase prices were set at considerably lower values compared to those that were later established in the BSP in 2022.

TABLE 26: COMPARISON OF THE ESTIMATED MARKET PRICE OF ELECTRICITY FOR WHICH PRODUCERS ARE ELIGIBLE FOR SUPPORT AND THE AVERAGE ANNUAL BASE PRICE IN THE BSP IN THE 2018–2022 PERIOD

Year	Estimated market price [EUR/MWh]	Average hourly price in BSP [EUR/MWh]
2018	44.54	51.16
2019	55.86	48.74
2020	53.10	37.55
2021	44.71	115.03
2022	108.71	274.47

SOURCES: ENERGY AGENCY, BORZEN, BSP

Emission Allowance Trading

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

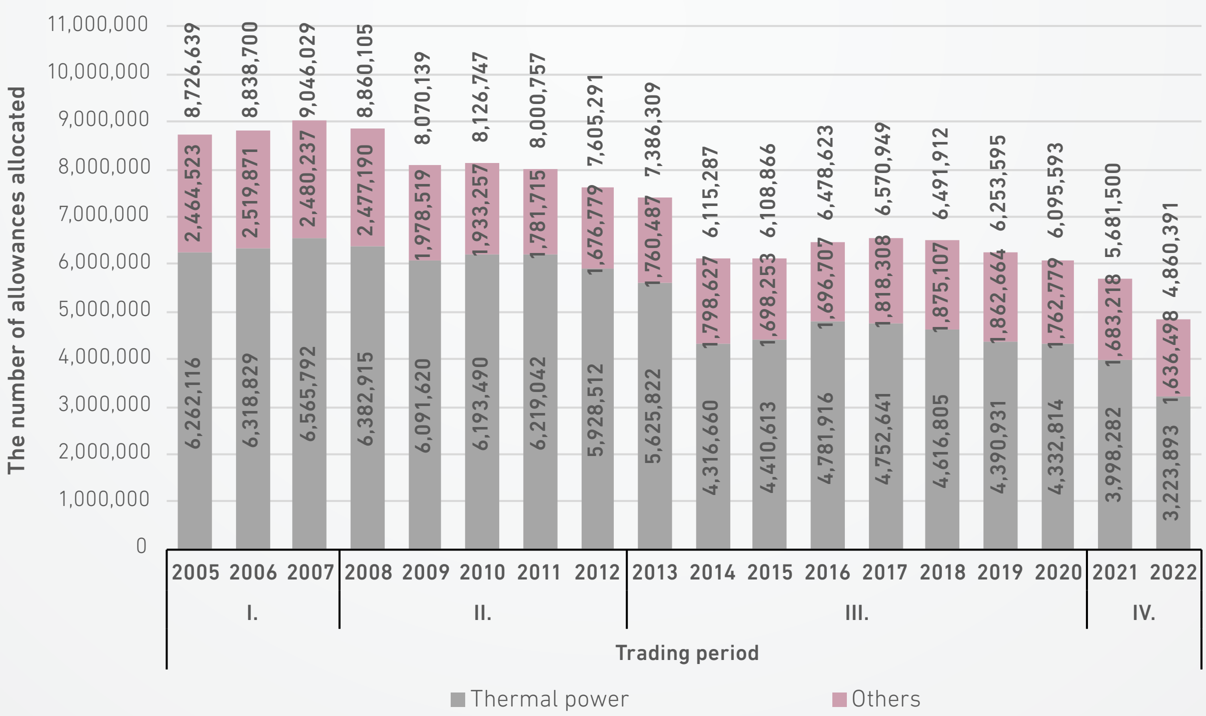
14.5% fewer allowances allocated

In 2022, there were 1,417,993 emission allowances issued with a total of 4,860,391 allowances. Facilities' operators had to purchase the difference at the auction or on the market. The number of distributed allowances has decreased for the fifth consecutive year. Compared to 2021, it fell by 14.5%.

Thermal power plant companies issued 3,223,893 allowances, which is 19.4% fewer than in 2021, which is the lowest in the 18-year period since the greenhouse gas emission allowance trading scheme (EU ETS) was established by the European Union in 2005. The largest allowance user in Slovenia is Šoštanj TPP, which allocated 2,660,753 allowances. In 2022, it allocated 21.2% less allowances compared to the year before, which is due to lower electricity generation. The rest of the industry allocated 1,636,498 allowances, which is 2.8% fewer than in 2021.

We are currently in the fourth trading period, which started in 2021 and will last until 2030. In this trading period, the rate of lowering commonly awarded emission allowances is lower, which would contribute towards a 43% decrease of emissions in this period compared to 2005. In addition, the share of emission allowances granted free of charge is dropping every year.

FIGURE 88: NUMBER OF DISTRIBUTED ALLOWANCES FOR ALL FOUR TRADING PERIODS IN 2005–2022



SOURCE: ARSO

Figure 89 shows the price trends for allowances for forward[56] contracts with a maturity in December 2022 (product of the EUA on the EEX). The average price in the observed period was around 81 EUR per tonne of CO_2, which is 53.5% higher compared to the average price of allowances from 2021 for a forward contract matured in December 2021. The lowest clearing price for allowances was reached at the end of the trading day on 7 March 2022 (58.3 EUR per tonne of CO_2). During the year, a trend of fluctuating prices was observed on the allowance market. The highest clearing price for allowances was reached at the end of the trading day on 19 August 2022 (98.01 EUR per tonne of CO_2). This was also the day when the record-high clearing price of forward contracts in question was reached.

Due to the record high prices of natural gas in 2022, units that had the option to switch to another fuel for electricity generation, opted for another input energy source[57]. Consequently, some producers substituted electricity generation from gas with electricity generation from coal in 2022. One of the consequences of this is the demand for allowances, since electricity generation per unit of electricity generated in coal power plants generates higher emissions. The increase in demand for allowances and the EU ambitions in the field of climate policy maintained pressure on wholesale prices, while the inflation, the energy crisis and the deteriorating economic outlook have suppressed an even greater increase of the price of allowances.

FIGURE 89: PRICE TRENDS OF ALLOWANCES (EUA) IN THE EEX EXCHANGE (BOUGHT IN 2022 FOR 2023)

SOURCE: MONTEL

56 Forward contracts are long- and short-term. Long-term forward contracts mature in a period that is longer than one year (an example of such a contract is the forward supply contract for 2024), while short-term contracts mature in a period that is shorter than one year (for example, a forward supply contract for December 2022).

57 On the Rotterdam exchange, forward contracts for the supply of coal in 2023 opened with a clearing price of 90.8 USD/t on the first trading day of the first half of 2022. They reached their peak on the trading day of 5 September 2022, when the clearing price at the end of the trading day reached 342.42 USD/t. In the first half of 2022, the average price of coal was 187.09 USD/t, and in the second half of the year, it rose to 255.61 USD/t.

Market Transparency

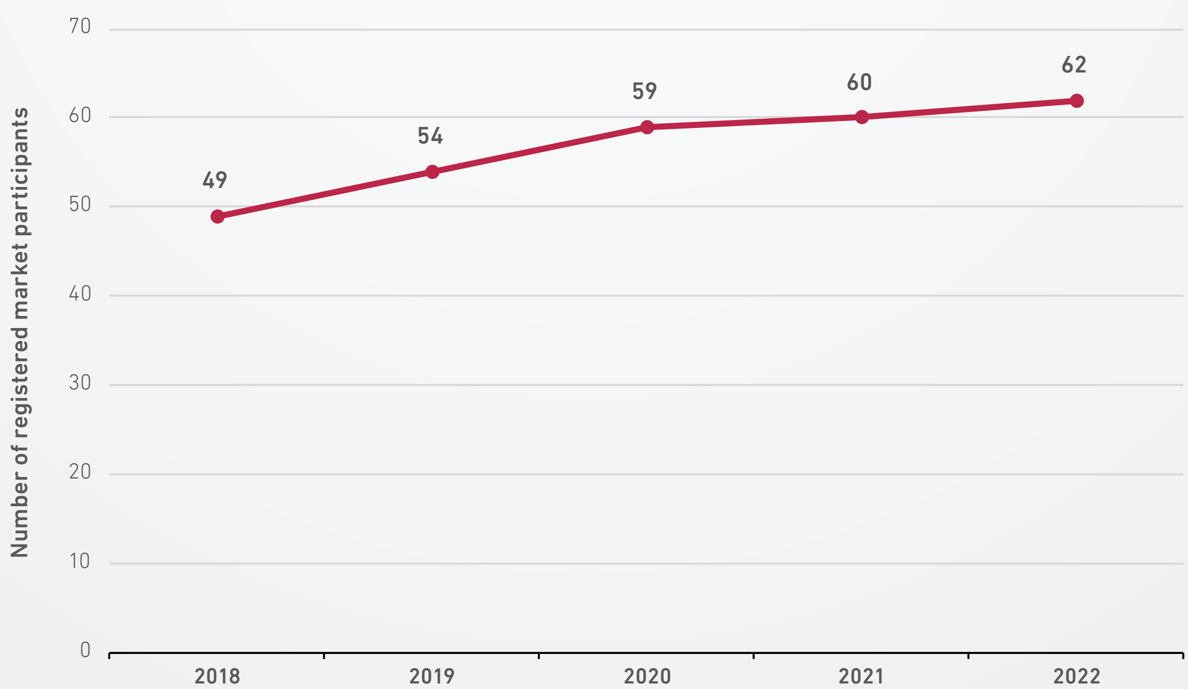
Regulation (EU) No 1227/2011 of the European Parliament and of the Council of 25 October 2011 on wholesale energy market integrity and transparency (hereinafter the REMIT Regulation) is key to ensuring the integrity and transparency of the energy market. Together with the Commission Implementing Regulation (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, it represents a comprehensive regulatory framework for monitoring and supervising the European electricity and natural gas wholesale markets. The Regulation consists of three major parts: a prohibition of market manipulation and insider trading, a requirement for the effective and timely publication of inside information, and the appropriate legislative framework for comprehensive market monitoring.

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

The Energy Agency is handling 11 cases of alleged breaches of the REMIT Regulation

In accordance with REMIT, market participants have to register with the national regulatory authority in the Member State in which they are established or resident or, if they are not established or resident in the EU, in a Member State in which they are active. 62 participants registered with the Energy Agency by 31 December 2022.

FIGURE 90: REGISTRATION OF MARKET PARTICIPANTS IN SLOVENIA IN THE 2018–2022 PERIOD



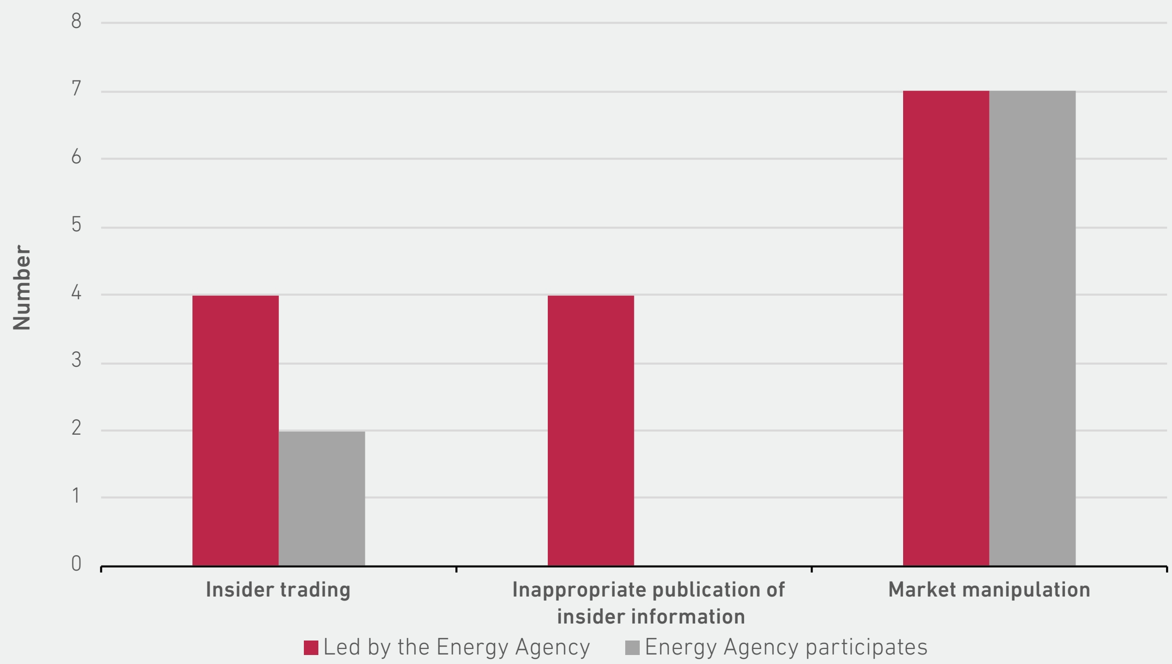
SOURCE: ENERGY AGENCY

In 2022, as part of monitoring the wholesale energy markets according to the REMIT Regulation, the Energy Agency conducted 11 cases and was at the same time included in seven foreign cases as part of mutual assistance between national regulative bodies. The number of cases conducted by the Energy Agency may vary year to year, if a case is taken over by another national regulative body due to changes in competence, which usually occur in the early phase of investigation and based on newly acquired facts.

In 2022, the Energy Agency concluded two procedures. Based on the acquired data and information regarding the alleged breaches, the Energy Agency concluded that there was insufficient evidence indicating the REMIT Regulation breach, which means that there were no breaches in the cases in question.

Figur 91[58] below shows the type of breaches investigated by the Energy Agency independently or in collaboration with foreign national regulative bodies. In some cases, a multitude of violations may be under investigation, therefore the total number of violations under investigation is higher or equivalent to the number of cases under investigation. The same figure shows a number of violations that are under investigation by foreign national regulators, with the Energy Agency being involved providing expert assistance.

FIGURE 91: THE NUMBER OF VIOLATIONS BASED ON THE TYPES OF VIOLATIONS ALLEGED AGAINST MARKET PARTICIPANTS IN PROCEEDINGS INVOLVING THE ENERGY AGENCY

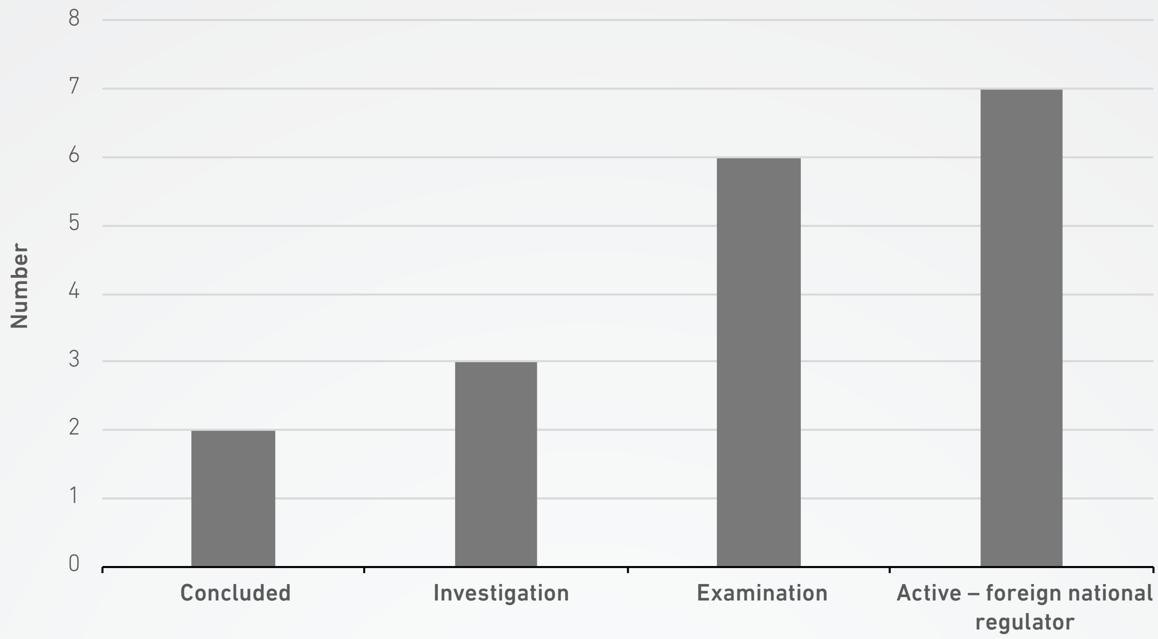


SOURCE: ENERGY AGENCY

An overview of the status of the cases is shown in figure 92. In 2022, the Energy Agency concluded two cases and conducted three investigations, while six were in the examination phase. The objective of the examination is to gain a deeper understanding of suspicious conduct by collecting additional information. In this phase, the Energy Agency identifies the circumstances in which the alleged violation occurred and reaches a decision on whether there are sufficient grounds for a suspicion of prohibited conduct. If the grounds are sufficient, the Energy Agency commences an investigation. In seven cases, in which the Energy Agency is involved in providing expert assistance, the procedures are at least in the examination phase.

58 »II« on the figure means »Insider Information«.

FIGURE 92: INVESTIGATION STATUSES



SOURCE: ENERGY AGENCY

Five out of eleven cases handled by the Energy Agency were initiated by the ACER based on the cooperation agreement concluded with them. Procedures were initiated on the basis of reported suspicious transactions or alarms triggered by the control system for detecting manipulation and abuse within the continuous market monitoring system ACER. The remaining six cases were remitted to the Energy Agency directly by the persons involved in arranging transactions with wholesale energy products as part of their activity. According to Article 15 of the REMIT Regulation, these persons are mandated to immediately notify the national regulatory activity if they have reason to suspect that a transaction has taken place on the wholesale market that constitutes a breach of the prohibition of insider trading or if such a transaction constitutes market manipulation.

All the cases conducted by the Energy Agency are connected to prohibited practices on the electricity market.

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

Market Effectiveness

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

Registration of Closed Contracts and Operational Forecasts

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

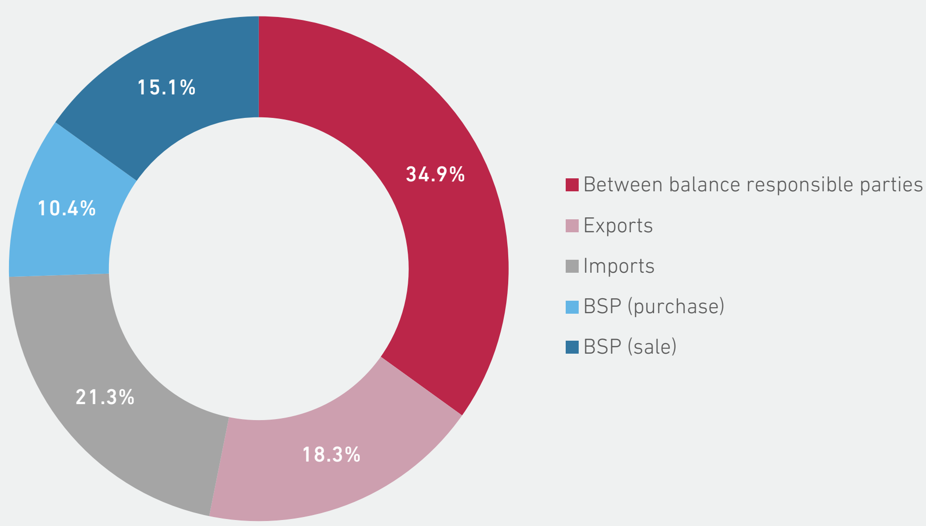
Borzen registers all closed contracts that affect the energy balance of a member of the Slovenian balance scheme. It registers all contracts concluded between members of the balance scheme, contracts concluded on the energy exchange and import-export closed contracts. Contracts concluded on bilateral 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 2022, the market operator registered a total of 99,371 closed contracts and operational forecasts for a total amount of 75,337,374 MWh. Compared to the previous year, the total number of registered closed contracts and operational forecasts rose by 2.2% in 2022, while the trading volume dropped by 9.0%.

The amount of electricity that was sold or purchased through closed contracts in 2022 was 50,077,730 MWh. Compared to 2021, when the total amount of closed contracts was 55,388,063 MWh, that amount has decreased by 9.6%. The total amount of the closed contracts decreased due to a drop in trading volume within Slovenia, namely less trading between the members of the balance scheme, while the amount of the closed contracts on regulation area margins increased compared to 2021.

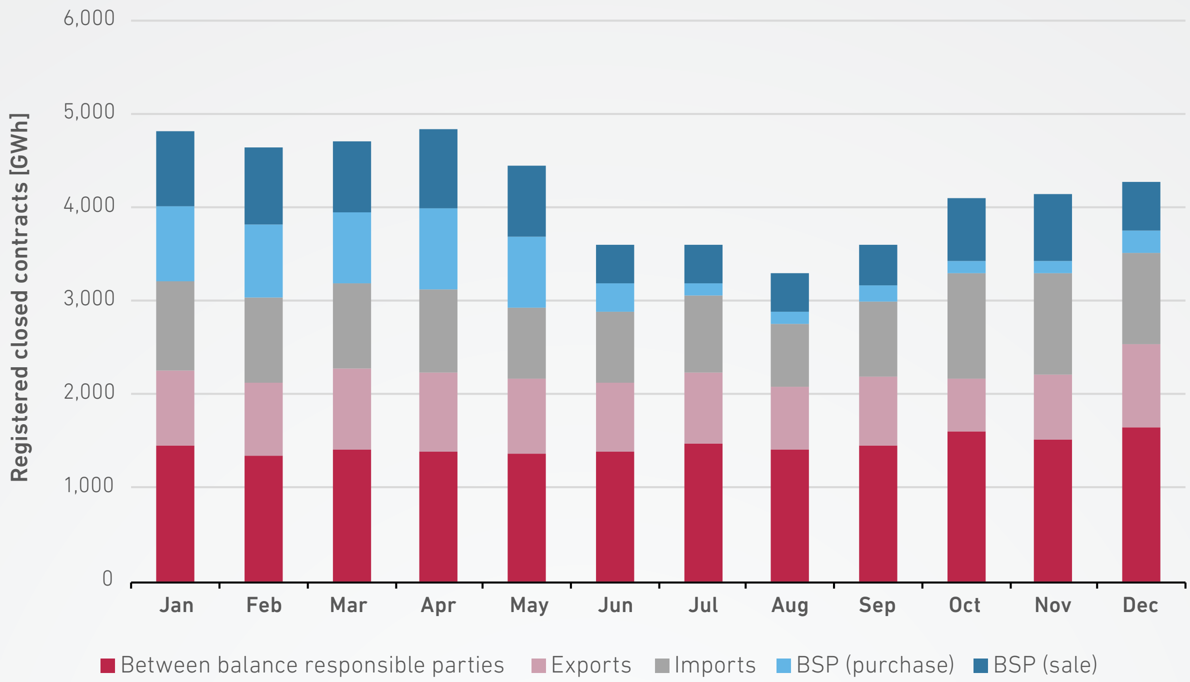
The structure of the volume of registered closed contracts and their corresponding quantities are shown in Figures 93 and 94.

FIGURE 93: STRUCTURE OF THE VOLUME OF REGISTERED CLOSED CONTRACTS



SOURCE: BORZEN

FIGURE 94: AMOUNT OF ELECTRICITY SOLD OR PURCHASED THROUGH CLOSED CONTRACTS PER MONTH



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 standardised hourly products into a trading application. The marginal price is calculated based on an algorithm of the trading application. Such trading is included in interregional market coupling, where any available CZCs are allocated. In 2022, market coupling included the borders of the Slovenian bidding zone with the bidding zones of Italy, Austria, Croatia and Hungary. The latter coupled with the Slovenian bidding zone in July[59]. The volume of trading is influenced by numerous factors, most importantly by the quantities of available CZCs.

17 market participants were involved in day-ahead trading in 2022, which is three fewer than in 2021. The majority of them were domestic participants.

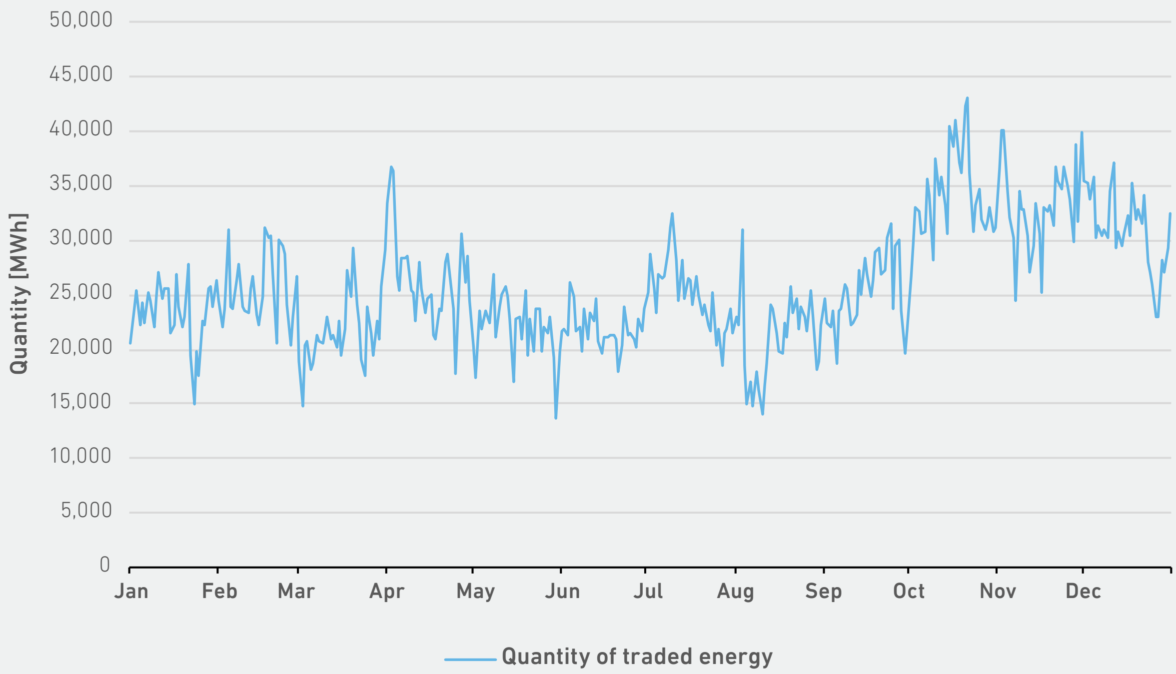
The total volume of trading in the Slovenian day-head market in 2022 amounted to 9,436,500 MWh or 16.1% more than in 2021. Bids in the total amount of 7373 GWh were recorded, of which 5753 GWh were purchase bids and 1620 GWh were sales bids. The volume of bids in this exchange segment grew, due to the increased volume of purchase bids. The average daily trading volume was 25,853 MWh and the highest daily trading volume, which was reached on 21 October 2022 (to be supplied on 22 October 2022) was 42,982 MWh. To illustrate the trading volume better, we can say that the average bidding for a single hour was 1.08 GW of capacity, which is around half of the average hourly consumption of electricity in Slovenia.

A 16.1% larger volume of trading on the Slovenian day-ahead market

The highest monthly trading volume in 2022 was achieved in October and amounted to 1,055,365 MWh, which is also the new monthly record in trading on the BSP exchange. The lowest monthly trading volume occurred in August. With the exception of January and April, the monthly trading volume exceeded all the trading volumes in the same periods in 2021. Figure 95 shows a strong increase in the trading volume in the last three months. In October and November, the trading volume exceeded the volumes in the same periods of 2021 by over 50%.

59 On 8 June 2022, the BSP together with 10 electricity market operators and 16 transmission system operators entered the Core Capacity Calculation Region as part of the day-ahead market coupling. Since then, the Core Calculation has been underway on all borders except with Italy. The last coupling was established on 30 June 2022 on the border with Hungary. In commercial terms, the coupling was included in the process of calculating cross-border capacity from 6 June 2022 for the day-ahead auction and from 7 June 2022 it was added for trading on the intraday market.

FIGURE 95: AMOUNT OF ELECTRICITY TRADED IN 2022



SOURCE: BSP

Intraday 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[60]. On the continuous intraday market, trading is carried out 24 hours per day with hourly, 15-minute and block products[61].

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

Eight Slovenian and five foreign market participants participated in the intraday market on the BSP at the end of 2022. Beside continuous trading, market participants can perform intraday auction trading through complementary regional auctions with Italy.

In 2022, the trading volumes have decreased in the segments of intraday continuous trading and auction intraday trading.

In 2022, the total volume of continuous intraday trading amounted to 1,040 GWh, which is less than the year before, when the total volume of continuous intraday trading amounted to 1,135 GWh (see the chapter Prices on the Intraday Continuous Market). Bids in the total amount of 4,400 GWh were recorded, of which 2,331 GWh were purchase bids and 2,069 GWh were sales bids. The volume of bids in this exchange segment grew in 2022.

As part of the total volume of intraday trading, the trading volume on the balancing market amounted to 33 GWh. An explanation of why certain quantities in intraday trading are treated as quantities in the balancing market is given in the following chapter.

60 As of 7 June 2022, the border with Hungary was also added for trading on the intraday market.
61 A more detailed definition of the products included in intraday continuous trading is available on the BSP Southpool official website: https://www.bsp-southpool.com/podatki-in-informacije/pravila-borze-in-cenik.html

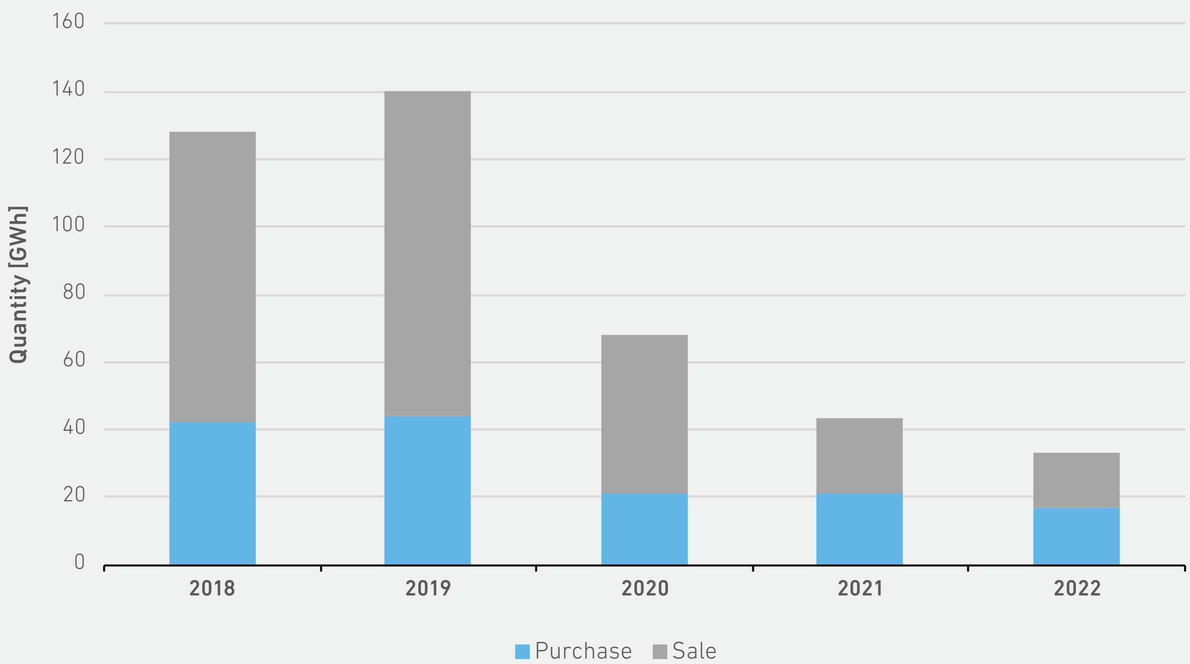
In 2022, the volume of auction intraday trading amounted to 444 GWh (implicit auctions MI1, MI2, MI3 and MI6 at the Slovenian-Italian border), which is slightly lower compared to the previous year, when the volume of auction intraday trading amounted to 494 GWh. Bids in the total amount of 8,959 GWh were recorded, of which 5,029 GWh were purchase bids and 3,930 GWh were sales bids. In 2022, the volume of bids in this exchange segment reached the highest mark in the comparative period of the last three years. The volume of trading on the intraday power exchange in 2022 accounts for 13.3% of all trading on the Slovenian electricity exchange, which is slightly less compared to 2021, when the volume of trading on the intraday power exchange accounted for 16.7% of all trading on the Slovenian electricity exchange.

Trading on the Market Operator Balancing Market

A 23% drop in trading volume on the 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 state that bids entered by members of the balancing market within intraday trading may be accepted by the TSO as bids placed in the balancing market, and that all transactions concluded with the TSO's bids for the purpose of balancing the electricity system are regarded as transactions in the balancing market. Transactions in the balancing market can be divided into transactions carried out in the intraday trading stage outside of the period of the last hour before supply, and transactions carried out in the trading stage within the last hour before supply. The latter is increasing and has reached a 99.4% share in 2022 (33.1 GWh). This means that the transmission system operator mostly purchases or sells electricity on the market operator balancing market in the last hour before supply. For practical reasons, trading in the Slovenian balancing market is carried out together with intraday trading. Under the authority of the market operator, both markets are carried out by the BSP. The same rules apply to both markets, subject to the principle that intraday trading ends one hour before the time of delivery and converts into trading in the balancing market. In 2022, 1605 transactions were concluded in the market operator balancing market for a total volume of 33.2 GWh. Out of these, 17 GWh represented the purchase of balancing energy and 16.2 GWh the sale of balancing energy by the TSO. Compared to the year before that, the quantity dropped by 23%. The drop in the volume is linked to an increase in liquidity and more favourable prices on the single coupled continuous intraday market, which increases the TSO's opportunities for system balancing. Most of the trading was performed for hourly products with a total volume of 29.1 GWh of electricity. With 1,094 concluded transactions, hourly products were also the most traded product in the balancing market.

FIGURE 96: TRADING VOLUME ON MARKET OPERATOR BALANCING MARKET IN THE PERIOD BETWEEN 2018 AND 2022



SOURCES: BORZEN, BSP

In 2022, the market operator balancing market accounted for 5.9%[62] of the entire system balancing, which is 2.7 percentage points less compared to 2021, when the share of the balancing market in the entire system balancing accounted for 8.6%. Besides the TSO, another three of a total of 29 members included in the market operator platform participated in trading, which is three less than in 2021.

Trading with Balancing Energy on the ELES Systemic Services Market

The ELES ancillary services market is run by the TSO. In the beginning of 2020, ELES started using the Slovenian platform for balancing services, which is controlled and managed by the transmission system operator, to activate aFRR and mFRR balancing energy. The platform is monitored and managed by the TSO and it also enables the collection and activation of aFRR and mFRR offers. The activation of the aFRR energy offers is carried out automatically via the management system, while for 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 for balancing power and balancing energy, which must also be separated according the balancing direction.

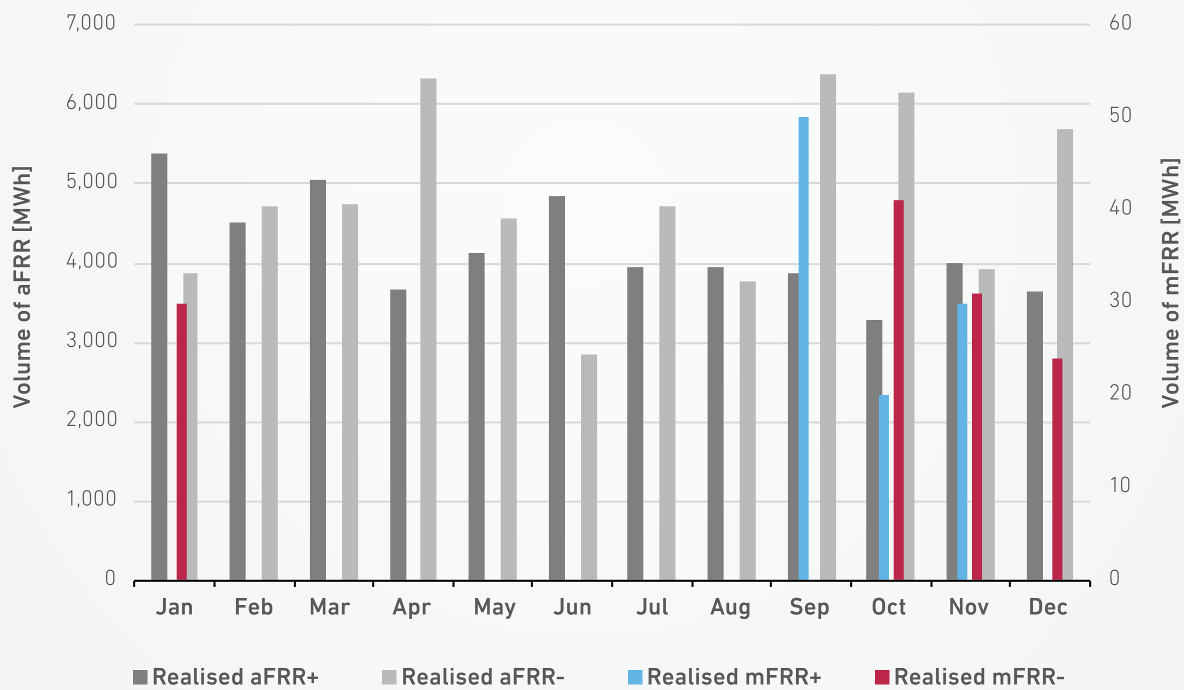
The level of competition on the aFRR and mFRR ancillary services market remains unchanged and extremely low

A provider that was successful in the auction for balancing power, must submit mandatory offers for balancing energy with an hourly resolution in line with the quantity and period of collected offers for balancing power. The remaining providers can submit offers for balancing energy on a voluntary basis. According to the order of activation of the balancing energy offers, the most favourable offers from the list, when the offers are classified according to the price, are activated first. Based on the selected offers, the aFRR and mFRR balancing energy is accounted for according to the pay-as-bid principle.

62 Share of the sum of FCR, aFRR, mFRR, RR, IGCC and Fskar quantities

In 2022, only two providers bid on the aFRR balancing energy, while bids for the mFRR balancing energy were made by five qualified providers of balancing services. Consequently, there is a very high concentration of the ancillary services market, while competitiveness and liquidity remain low. In 2022, the quantity of bids for the positive balancing direction on the aFRR balancing energy trading platform was 535 GWh, and 515 GWh for the negative direction. The activated energy for the positive direction amounted to 50.3 GWh, and for the negative direction 57.7 GWh. The bids for the mFRR+ balancing energy amounted to 2,125 GWh, while the bids for the mFRR– balancing energy amounted to 410 GWh. Out of this, the activated energy for the positive direction amounted to a mere 100 GWh, and for the negative direction 126 GWh. Since the implementation of the organized collection of offers, the said quantities with hourly resolutions generally coincide with the minimum necessary ranges of ancillary services, which means that the providers did not seize the opportunity to submit voluntary competitive offers. This confirms the poor competition of balancing service providers and low liquidity on this segment of the market. Due to operating issues in the regulation group of the supplier HSE[63], there was a significant deviation in the offered quantities of aFRR+ and aFRR– balancing energy with the quantities, corresponding to the reservations of power with this supplier (mandatory offer). In November, for example, HSE offered only around 77% of the mandatory quantities for aFRR+ and aFRR–, and there were even certain hours where, in both aFRR+ and aFRR–, the offered quantities amounted to a mere 15% of the mandatory quantity.

FIGURE 97: REALISED aFRR AND mFRR QUANTITIES



SOURCE: ELES

In the provisioning of the aFRP activated quantities, 50.3 GWh of positive and 57.7 GWh of negative energy indicates, that in 2022, ELES activated less positive and more negative energy compared to 2021, when they activated 56.1 GWh of positive and 50.6 GWh of negative energy. The difference is mainly due to the fact that ELES often faced transmission capacity constraints in imbalance netting in the direction of Slovenia in 2022, because it was included in the International Grid Control Cooperation (IGCC) for imbalance netting. As a result, in the context of offsetting positive imbalances within the IGCC in 2022, ELES exported 134.6 GWh to offset positive imbalances, reducing the need for negative aFRP energy activation, and imported 72.0 GWh to offset negative imbalances, with the corresponding decrease in the activation of positive aFRP energy. Since 2019, Slovenia has been participating in the imbalance netting project within the IGCC; as can be seen, the amount of energy exchanged in this process is increasing from year to year.

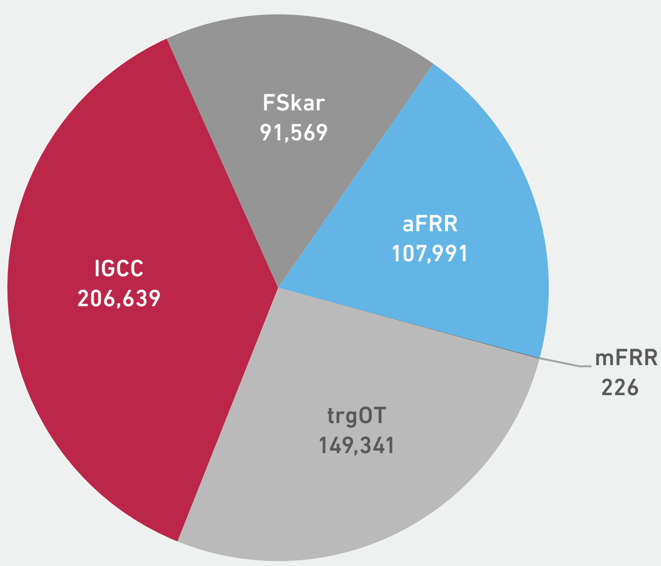
63 Shortage of coal and consequently reduced and even stopped operation of Šoštanj TPP.

In performing mFRP, ELES activated 100 MWh of positive energy, which is considerably less than in the previous year, when it activated no less than 967 MWh of positive energy. All the activated energy as part of the mFRP, was contributed by domestic providers of balancing services. On the other hand, in 2022, ELES activated 126 MWh of negative mFRR, which is an increase of 76 GWh compared to the previous year. In 2022, there was a total of seven mRFF activations, three in the positive direction and four in the negative direction. This is less than in 2021, when there was a total of 11 activations of the manual frequency restoration reserve.

In 2022, ELES purchased part of the energy to keep the electricity system balanced on the market operator balancing market, and had to ensure part of the energy for the balancing of unintentional deviations of the electricity system (FSkar). In the intraday market, which includes the balancing market of the market operator and the continuous intraday market, ELES activated 61.7 GWh of positive and 87.6 GWh of negative energy. In terms of unintended energy exchanges (FSkar settlement), 49.7 GWh of positive and 41.9 GWh of negative energy were exchanged in 2022.

Figure 98 shows the activated absolute quantities (sum of the absolute negative and positive balancing energy) according to the type of service: this particularly shows the considerable importance of balancing with neighbouring transmission system operators for the Slovenian electricity system.

FIGURE 98: ABSOLUTE VALUES OF ACTIVATED QUANTITIES OF BALANCING ENERGY IN MWh



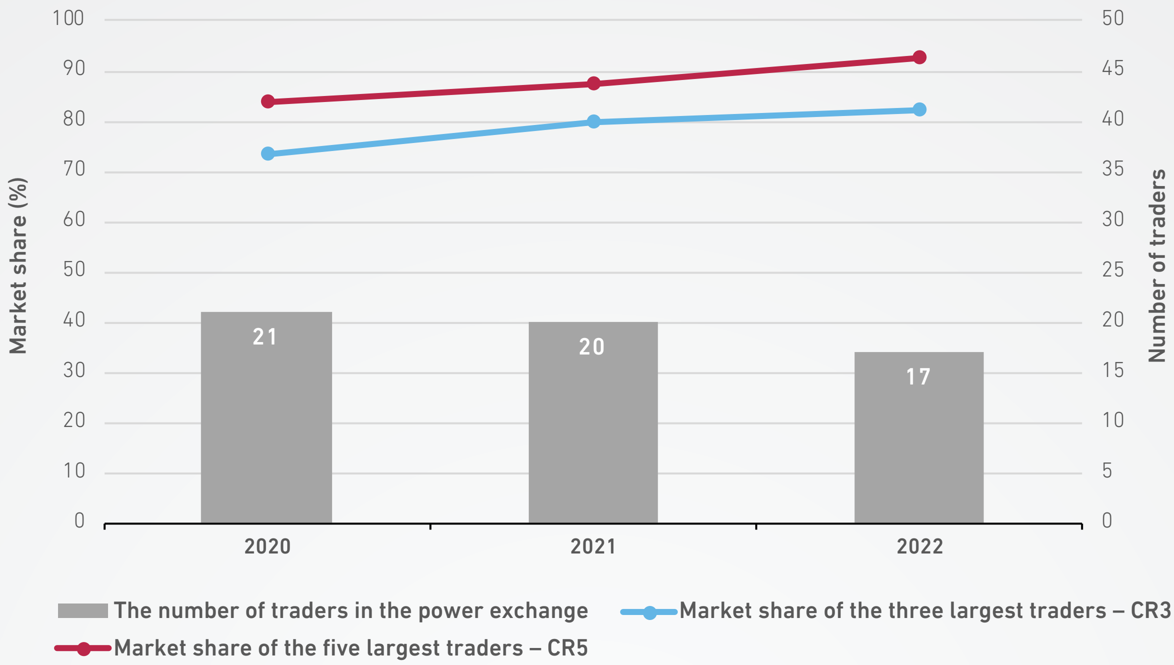
SOURCE: ELES

Concentration in the Power Exchange

In 2022, 17 Slovenian and foreign companies traded on the BSP in the day-ahead market, which is three fewer than at the end of 2021. The number of traders operating on the BSP has been steadily falling in the last five years. As an indicator of the level of concentration, the total market share of the three largest traders (CR3) was 82.2% in 2022, which indicates a new rise compared to 2021 when the share was 79.8%. The total market share of the five largest traders (CR5) was 92.8%, which is also an increase compared to 2021 when it was 87.3%.

The HHI index has risen again and now amounts to 3,726, which indicates a high concentration in the wholesale market.

FIGURE 99: MARKET SHARE AND NUMBER OF TRADERS IN THE SLOVENIAN POWER EXCHANGE ACCORDING TO TRADED VOLUME



SOURCE: BSP

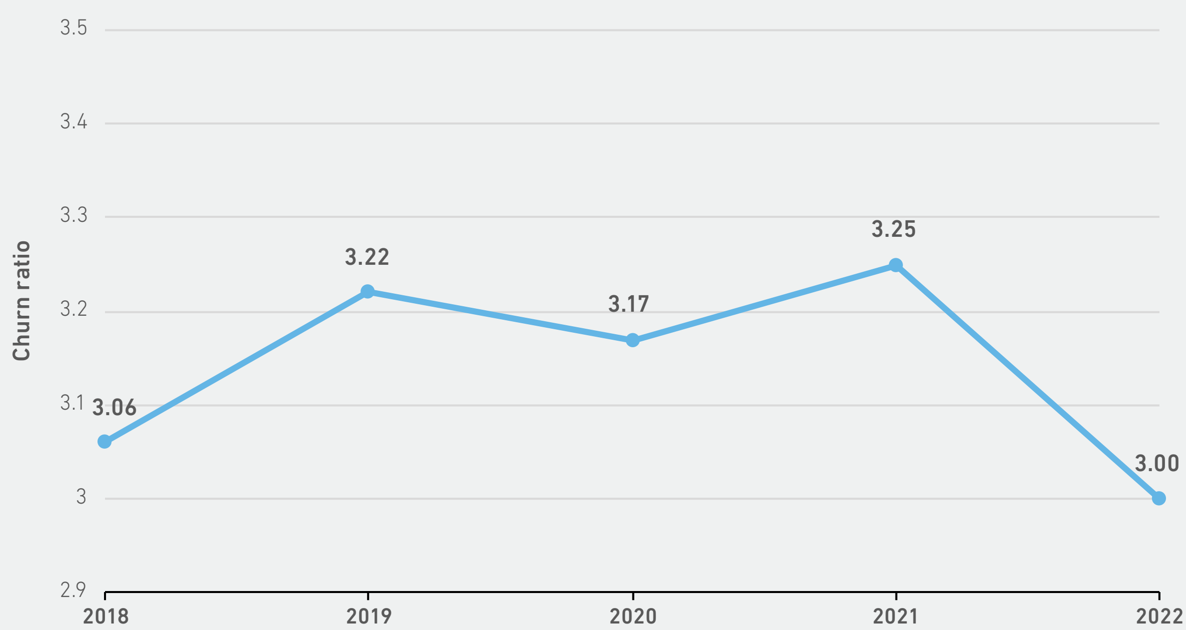
Wholesale Market Liquidity

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[64]. Figure 100 shows the trends of the index during the five-year period under review. Compared to the previous year, the value of the index decreased slightly in 2022. The index is 3, indicating that the Slovenian wholesale electricity market is now on marginal value. Even though our wholesale market is smaller in comparison with other European markets, there are still a relatively large number of active participants. They are Slovenian and foreign, large and small, which shows that the Slovenian market is open to the entry of new participants. The number of transactions concluded by the Slovenian market participants is comparable to that of participants in foreign markets. Similarly to foreign markets, the market conditions that shape the prices elsewhere, also reflect product prices in Slovenia.

The wholesale electricity market continues to be well-developed

64 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 the BSP, as well as that traded on the bilateral market.

FIGURE 100: TRENDS OF THE CHURN RATIO PER YEAR IN THE 2018–2022 PERIOD



SOURCES: ENERGY AGENCY, BORZEN

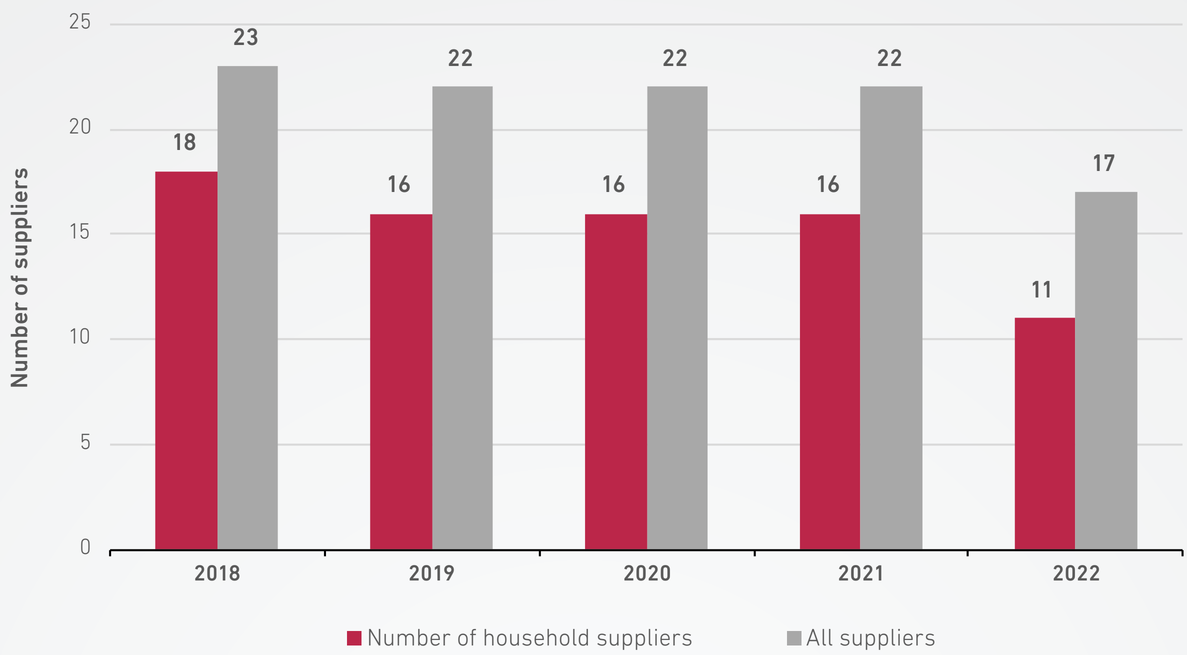
Retail Market

Suppliers and final consumers in the Slovenian retail market sign open contracts, in which the quantities of supplied electricity and the time profile of supply are not set in advance. In 2022, Salonit Anhovo became an additional supplier. On the other hand, there were a number of exits. At the beginning of the year, as of 1 January 2022, pursuant to their prior notice, Telekom ceased its activities as a supplier. From 31 March 2022, the market operator terminated the balancing agreement with the supplier Elektro prodaja E.U., which stopped the supply of electricity on that same day. Two of the members of the balance-responsible parties of the aforementioned supplier were Energija direkt and Adriaplin. Consequently, they both stopped supplying consumers on 31 March 2022. On 1 September 2022, pursuant to their prior notice, E.ON ceased activities as a supplier. The last exit of 2022 occurred on 22 November 2022, when Europe Energy S.p.A.'s membership in the balance scheme terminated, as a result of which the membership also terminated for the supplier Energia gas and power, which was part of the balance-responsible party Europe Energy S.p.A.

Six exits from the retail electricity market

At the end of the year, there were 17 electricity suppliers active in this market, of which 11 supplied electricity to household consumers.

FIGURE 101: TRENDS IN THE NUMBER OF SUPPLIERS IN THE SLOVENIAN RETAIL MARKET IN 2018–2022[65]



SOURCE: ENERGY AGENCY

The business models of suppliers are still different. Some supply electricity only to household consumers, others only to businesses, but most of them to both. Due to considerable price movements on the wholesale market, suppliers faced considerable challenges in the field of price risk management in 2022. As a result, in 2022, a larger number of suppliers exited the retail market compared to previous years.

Prices

Retail electricity prices were not regulated and were determined on the market until 1 September 2022. Due to rapidly changing and growing wholesale and retail prices, on 14 June 2022, the Government adopted the Decree on the Determination of Electricity Prices, which entered into force on 1 September 2022. The Decree established the highest permitted retail selling price (hereinafter retail price) for household consumers, small business consumers, and for the use in common areas of multi-dwelling buildings and commons spaces in mixed multi-dwelling and business buildings. The Energy Agency regularly monitors the prices set for household and small business consumers based on data on prices and offers in the retail market for households and small business consumers, which is submitted by the suppliers on a monthly basis.

Retail Price Index for Typical Household Consumers

On the basis of monitoring the retail market for household consumers, the Energy Agency determines the 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.

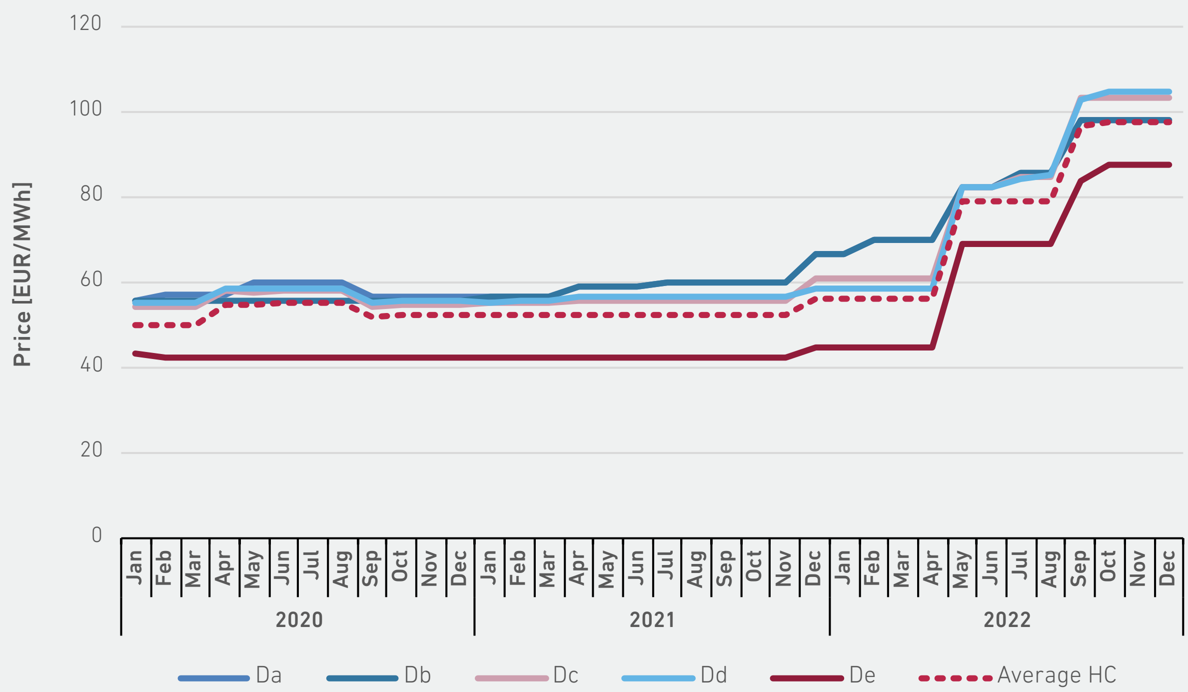
Figure 102 shows the trends of the RPI for standard consumer groups Da, Db, Dc, Dd, De[66] and an average Slovenian household consumer[67] in the 2020–2022 period. Most of the consumers in the retail market (except those who have contracts that include contractual penalties) have the option of switching their supplier or the product (offer) provided by their current supplier. In that way, they are sure to be supplied with electricity at a price reflected by the RPI.

65 The statistics of suppliers includes suppliers that supplied electricity on the last calendar day of individual years.

66 Consumer groups according to the EUROSTAT methodology used until 2007 (Dc: annual consumption 3,500 kWh of which 1,300 kWh (off-peak tariff)) - https://ec.europa.eu/eurostat/databrowser/view/NRG_PC_204_H__custom_6471365/default/table?lang=en

67 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 102: RETAIL PRICE INDEX IN THE 2020–2022 PERIOD



SOURCE: ENERGY AGENCY

Figure102 shows that during 2022, the RPI was increasing across all consumer groups. In the last quarter of the year, the RPI stabilised for all consumer groups, which is due to the establishment of the highest permitted retail price in accordance with the Decree on the Determination of Electricity Prices. Compared to January, the RPI increased the most in the consumer group De, namely by 97%. In the same period, the lowest rise was recorded in the smallest consumer groups Da and Db. Much like in the second half of 2021, the rise of the RPI in 2022 was a consequence of the delayed transfer of the higher prices from the wholesale to the retail electricity market.

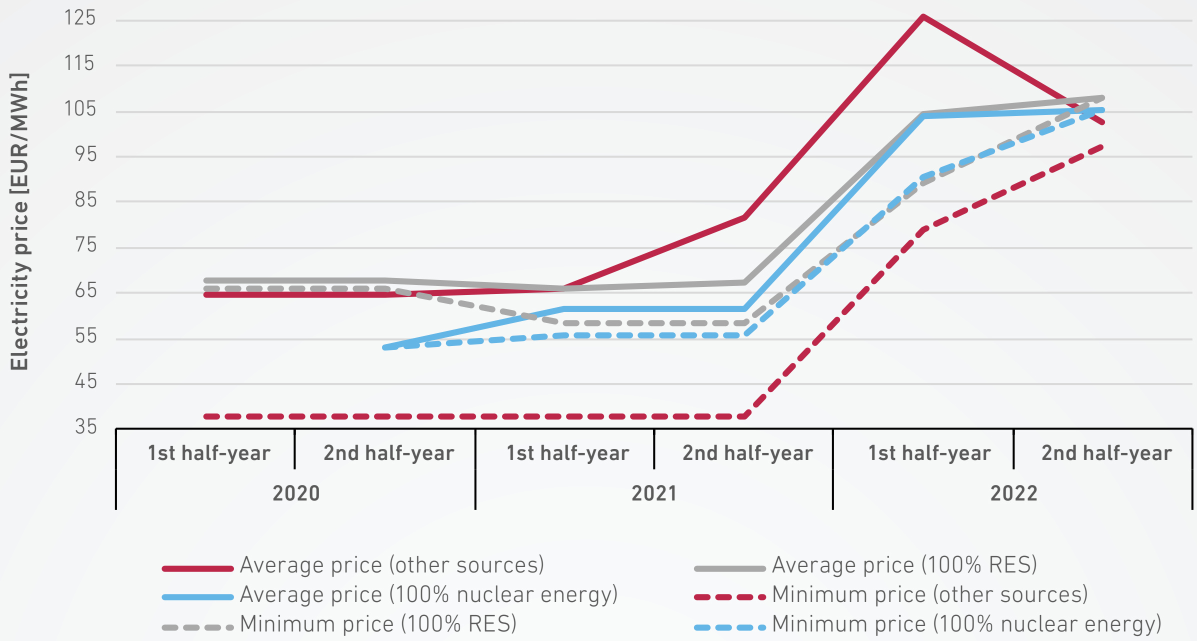
In the second half of the year, suppliers did not replace the expiring and economically most advantageous bids with bids in comparable price ranges. The RPI trend in 2022 implicitly discloses the suppliers' portfolio structures, since we can presume that the suppliers' portfolios were not generally secured with forward contracts, purchased on the electricity wholesale market before the period of the significant rise of wholesale prices (i.e., in the period before the last quarter of 2021).

Analysis of Green Electricity Prices

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

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

FIGURE 103: PRICE TRENDS OF OFFERS FROM 100% RES, 100% NUCLEAR ENERGY, AND OTHER OFFERS IN SLOVENIA FOR A TYPICAL HOUSEHOLD CONSUMER IN THE 2020–2022 PERIOD



SOURCE: ENERGY AGENCY

Figure 103 shows the trends in the average prices of electricity, 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 in the 2020–2022 period[68].

In 2022, the average and lowest electricity prices were higher compared to the year before, regardless of the type of offer. In the first half of 2022, the average prices of all types of offers increased drastically compared to the second half of 2021. However, in the second half of 2022, the average prices of the remaining offers dropped by 18% compared to the first half of the year due to the Decree on the Determination of Electricity Prices, which put a price cap on retail electricity prices. On the other hand, the prices of offers from 100% RES rose by 3% compared to the first half of 2022, while the prices of offers from 100% nuclear energy rose by 2%. On 31 August 2022 (on the last day before the Decree on the Determination of Electricity Prices entered into force), the average prices of all types of offers were higher than those provided by the Decree. In the second half of 2022, the lowest average price was that of offers from 100% nuclear energy, while the highest average price was that of offers from other energy sources. The lowest prices of the remaining offers from 100% nuclear energy and offers from 100% RES was growing all year long. Compared to the first half of 2022, the second half saw the lowest price of the remaining offer grow by 23%. The lowest price of the offer from 100% nuclear energy rose by 17%, while the lowest price of the offer from 100% RES in this period rose by 21%. A comparison between the second half of 2021 and the second half of 2022 shows that the lowest price of the remaining offer grew by 158%, the lowest price of the offer from 100% grew by 88%, while the lowest price of the offer from 100% RES grew by 85%. In the second half of 2022, the market share of offers from 100% RES amounted to 25%, while share the of offers from 100% nuclear energy amounted to 13%. Compared to the same period of 2021, the share of offers from 100% nuclear energy rose by 8 percentage points and the share of offers from 100% RES rose by 2 percentage points.

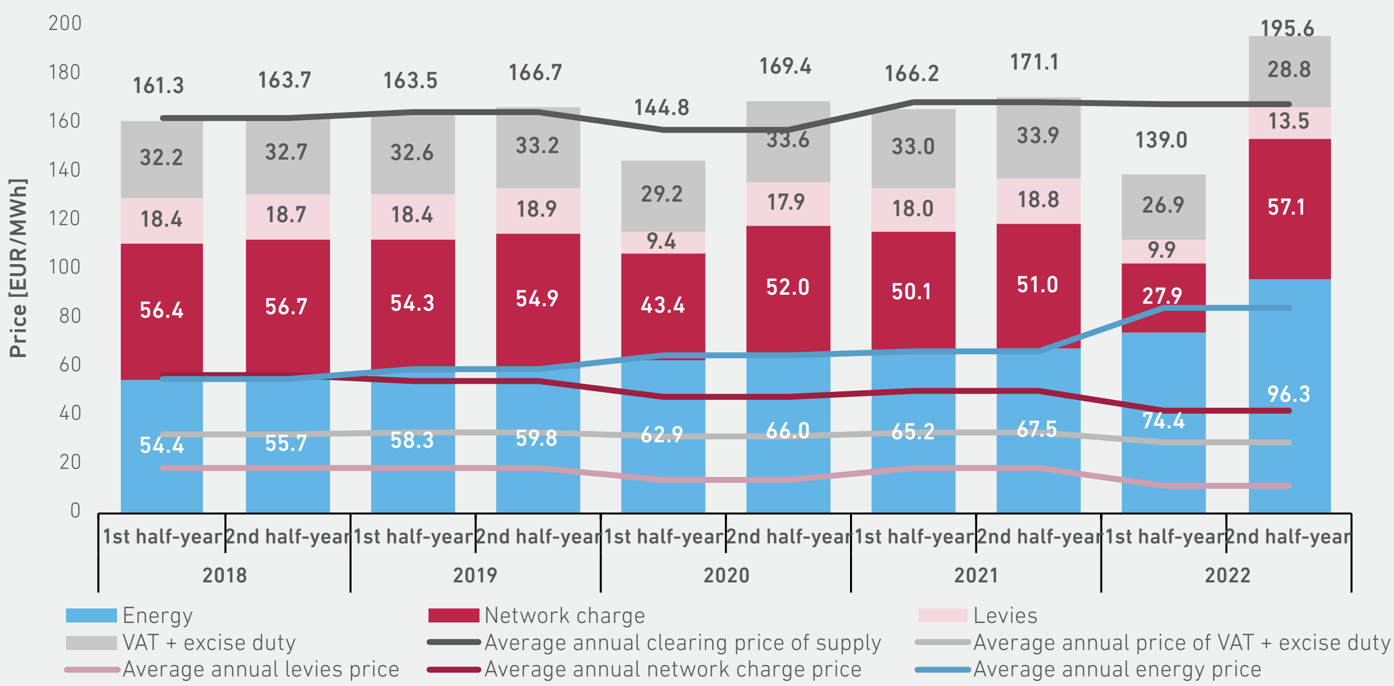
68 Consumption profile of an average household consumer: billed capacity 8 kW, annual consumption 1996 kWh (peak tariff) and 2100 kWh (off-peak tariff)

Final Electricity Supply 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 is presented below[69]. The final electricity supply price for consumers includes:

- the price of electricity, which formed freely on the market during most of 2022;
- network charges:
  - network charges for the transmission and
  - network charges for the distribution network;
- levies:
  - levy for supporting electricity production with high-efficiency cogeneration and renewable electricity (RES);
  - the energy efficiency levy, and
  - levy for the operation of the market operator;
- excise duties and
- value-added tax (VAT).

FIGURE 104: TRENDS OF THE FINAL ELECTRICITY SUPPLY PRICE IN SLOVENIA FOR A TYPICAL HOUSEHOLD CONSUMER IN THE 2018–2022[70] PERIOD



SOURCES: ENERGY AGENCY, SURS

Despite the significant growth of electricity retail prices, the final average annual supply price dropped by 0.5% due to the Government's intervention in network charges, taxes, excise duty and levies. The drop in the final supply price is a consequence of the adopted provisional measures, which included exemptions from the network charge for the transmission and distribution systems for all consumer groups in the period between 1 February and 30 April 2022[71]. In the same period, household consumers and consumers on the LV level without power metering were exempt from RES and CHP levies. In February 2022, excise duty decreased, and in September, the VAT rate for electricity and the RES and CHP levies were also reduced.

69 The standard consumer group DC includes household consumers with an annual consumption between 2,500 and 5,000 kWh

70 The difference between the total and the sums of the individual components of the final electricity supply price is due to rounding to one decimal place.

71 Based on the Act Determining Emergency Measures to Mitigate the Consequences of the Impact of High Energy Commodity Prices (ZUOPVCE) (Official Journal of the Republic of Slovenia no 29/2022), the period from 1 February to 30 April 2022 saw the implementation of a provisional measure to exempt all consumer groups from the network charge for the transmission and distribution systems.

These measures are the reason behind the reduced network charges in the first half of the year, and the reduced amounts of levies, VAT and excise duty in the second half of the year. Also affecting the final supply price was the increase of the price of electricity, which on the annual level in 2022 amounted to 27.8% compared to 2021.

The share of the network charge in the final electricity supply price for a typical household consumer in 2022 was 25.2%, the share of energy was 50.5%, the share of the levies was 6.9% and the share of VAT and the excise duty was 17.4%

A 0.5% decrease in the final annual average price for the typical household consumer -

27.8% higher price of electricity, 16.4% lower network charges due to a three month exempt from payment, reduced VAT, excise duty and RES and CHP levies

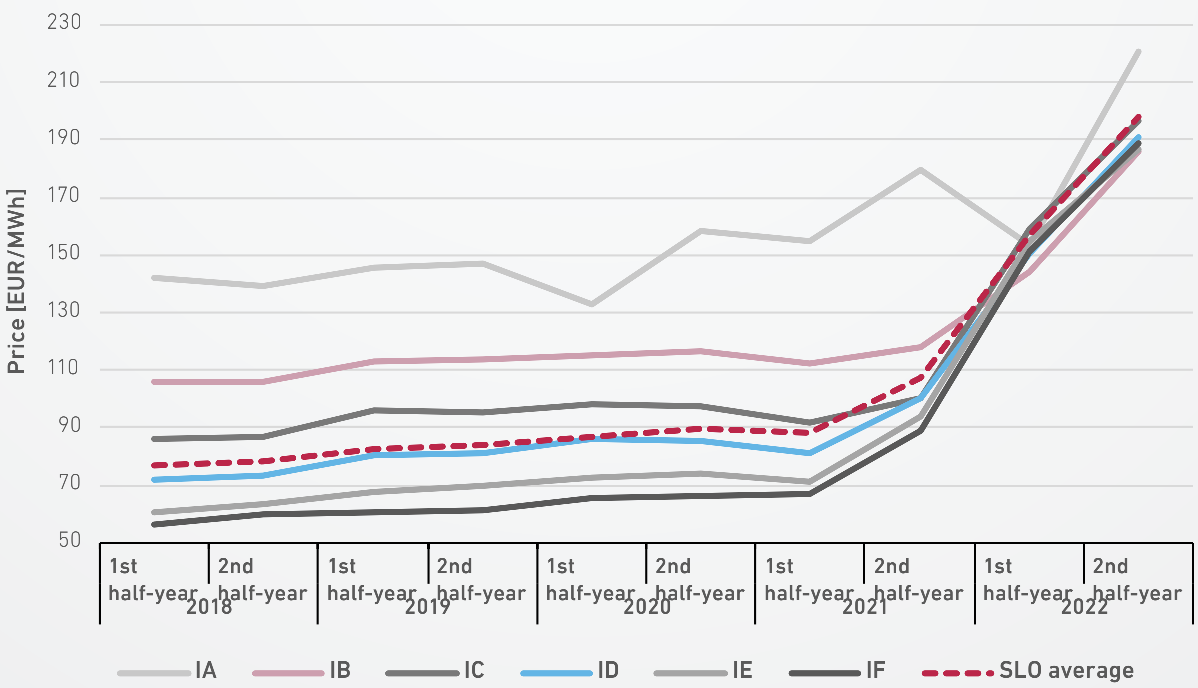
.

Final Electricity Supply Prices for Business Consumers

The average final electricity supply price for business consumers, which represents the average of the prices for the first and second half of the year excluding VAT[72], was 177.6 EUR/MWh in 2022, which is an 81.5% rise compared to 2021[73]. The final prices for supply rose for all consumer groups. The final price in the 2022 annual average for the largest group IF had increased by 118.2% compared to 2021, which represented the biggest increase. The final price in the annual average for the smallest group IA had increased by 11.6% compared to 2021, which represented the smallest increase. The trends of the final electricity supply price in Slovenia for typical business consumers between 2018 and 2022 according to half-year periods are shown in Figure 105.

Over 80% increase in the final electricity supply prices for business consumers

FIGURE 105: TRENDS OF THE FINAL ELECTRICITY SUPPLY PRICE IN SLOVENIA FOR A TYPICAL BUSINESS CONSUMER IN THE 2018–2022 PERIOD



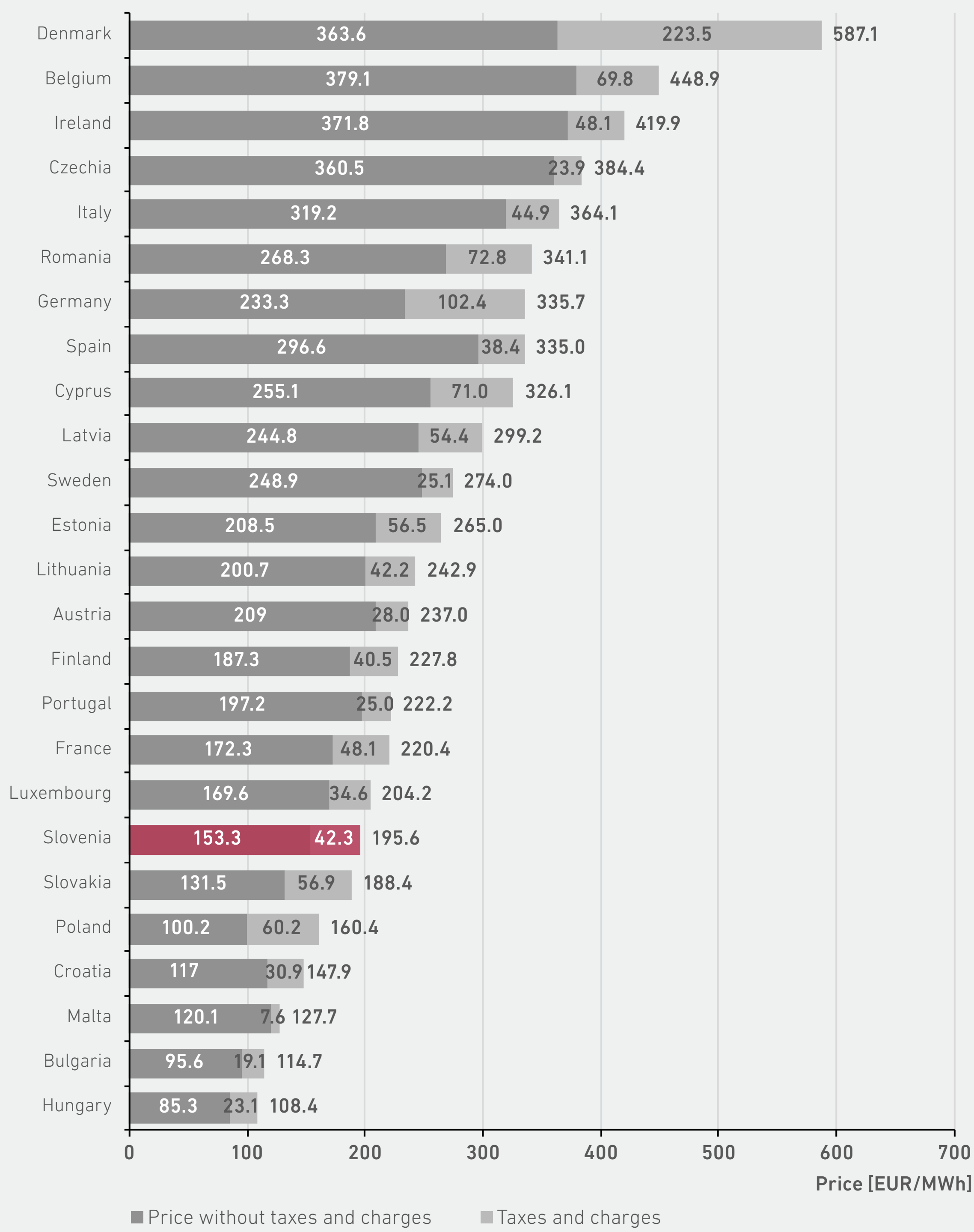
SOURCE: STATISTICAL OFFICE OF THE REPUBLIC OF SLOVENIA

72 The VAT is not taken into account to ensure comparability with Eurostat's methodology.
73 The difference is rounded to one decimal place.

Comparison of the Final Electricity Supply Prices Between the EU Member States

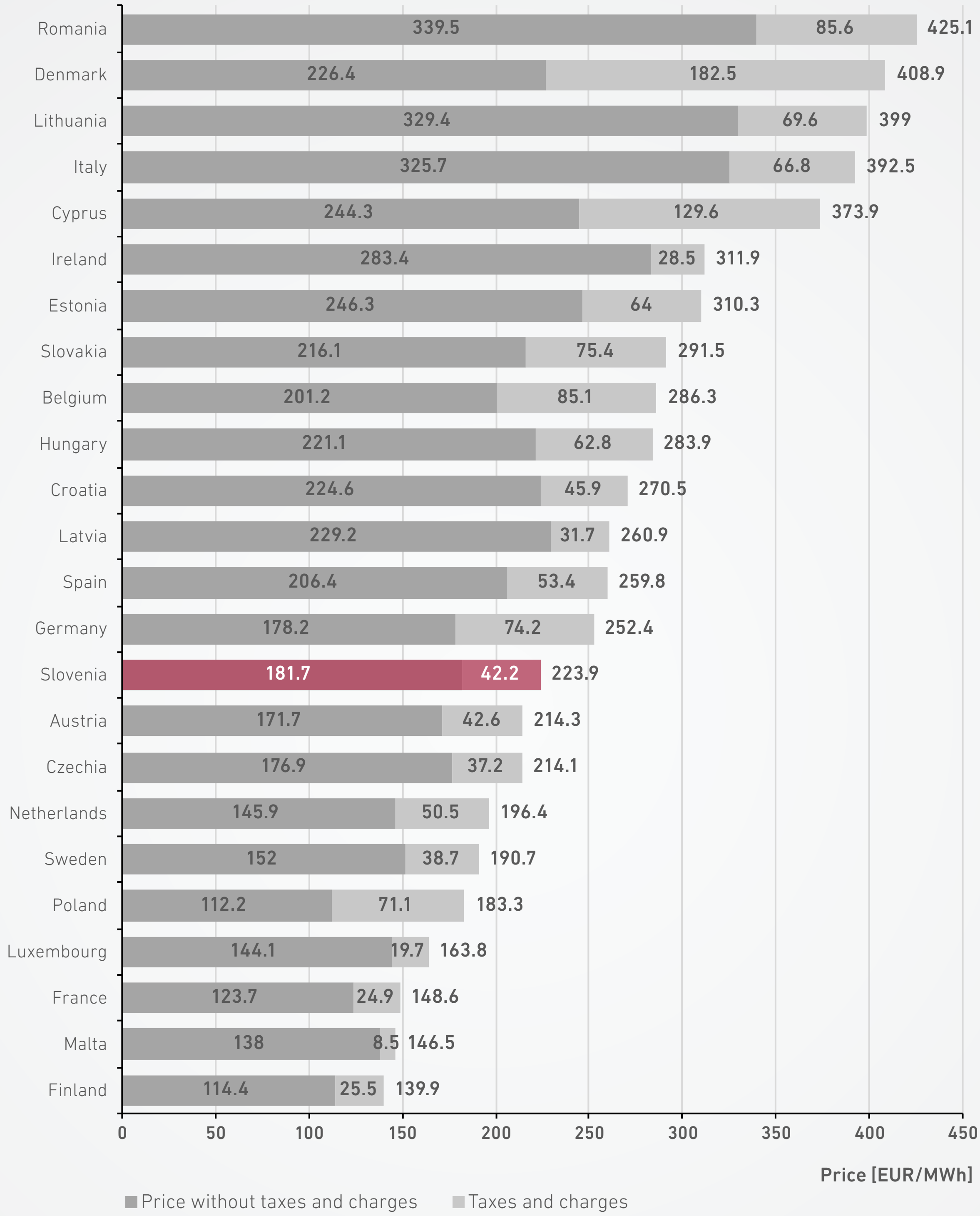
Figure 106 and figure 107 show a comparison of the final electricity supply prices in EU Member States in the second half of 2022 for typical household and business consumers selected in accordance with the Eurostat methodology. Taxes and charges include levies, excise duty and VAT, while the price without charges and taxes includes the price of energy and the network charge.

FIGURE 106: COMPARISON OF THE FINAL ELECTRICITY SUPPLY PRICES FOR A TYPICAL HOUSEHOLD CONSUMER WITH AN ANNUAL CONSUMPTION OF BETWEEN 2500 kWh AND 5000 kWh (DC) IN THE EU MEMBER STATES AND SLOVENIA IN 2022 IN EUR/MWh



SOURCE: EUROSTAT

FIGURE 107: 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 2022 IN EUR/MWh



SOURCE: EUROSTAT

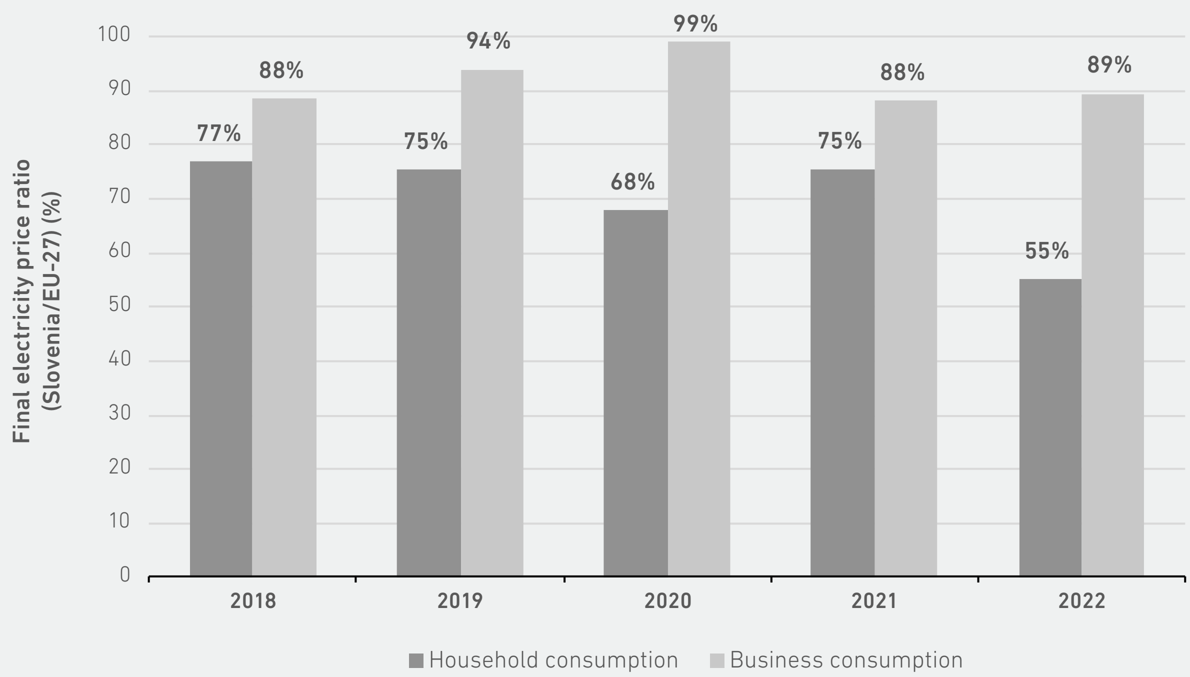
In the internal electricity market, retail electricity pricing is market-based, while in some EU countries, regulated electricity retail prices are also present. The retail price depends on the structure of production sources and the accessibility of neighbouring markets, as well as on market activities.

The final electricity supply price for a typical household (DC) and business (IB) consumer was below the EU average

Despite the well-functioning market where electricity prices converge over years, differences in the final supply prices occur in network charges, charges in support of renewable energy production policies and in taxes. The final total supply price for a typical Slovene household consumer was below the EU average and also lower than in Austria and Italy, but higher than in Croatia and Hungary. The final electricity supply price for a typical Slovene business consumer at the nominal level is also below the EU average. Compared to neighbouring countries, the price is only lower in Austria, while Italy, Hungary and Croatia have higher prices.

Figure 108 shows the final electricity supply prices for a typical household consumer and a selected business consumer (IC)[74] in Slovenia in relation to the EU 27 average in the five-year observation period. Analysis shows that in the last year, the final supply price for household consumption in Slovenia decreased by approximately 20.4 percentage points compared to the preceding year. Compared to the EU-27, the ratio of the final supply price for household consumption in Slovenia in 2022 dropped to the lowest level in five years. The reasons behind this are stated in the chapter Final Electricity Supply Prices for Household Consumers. On the other hand, business consumption in Slovenia shows a lower growth of the final supply price in comparison with the EU-27. With respect to the previous year, the growth was 1.3 percentage points.

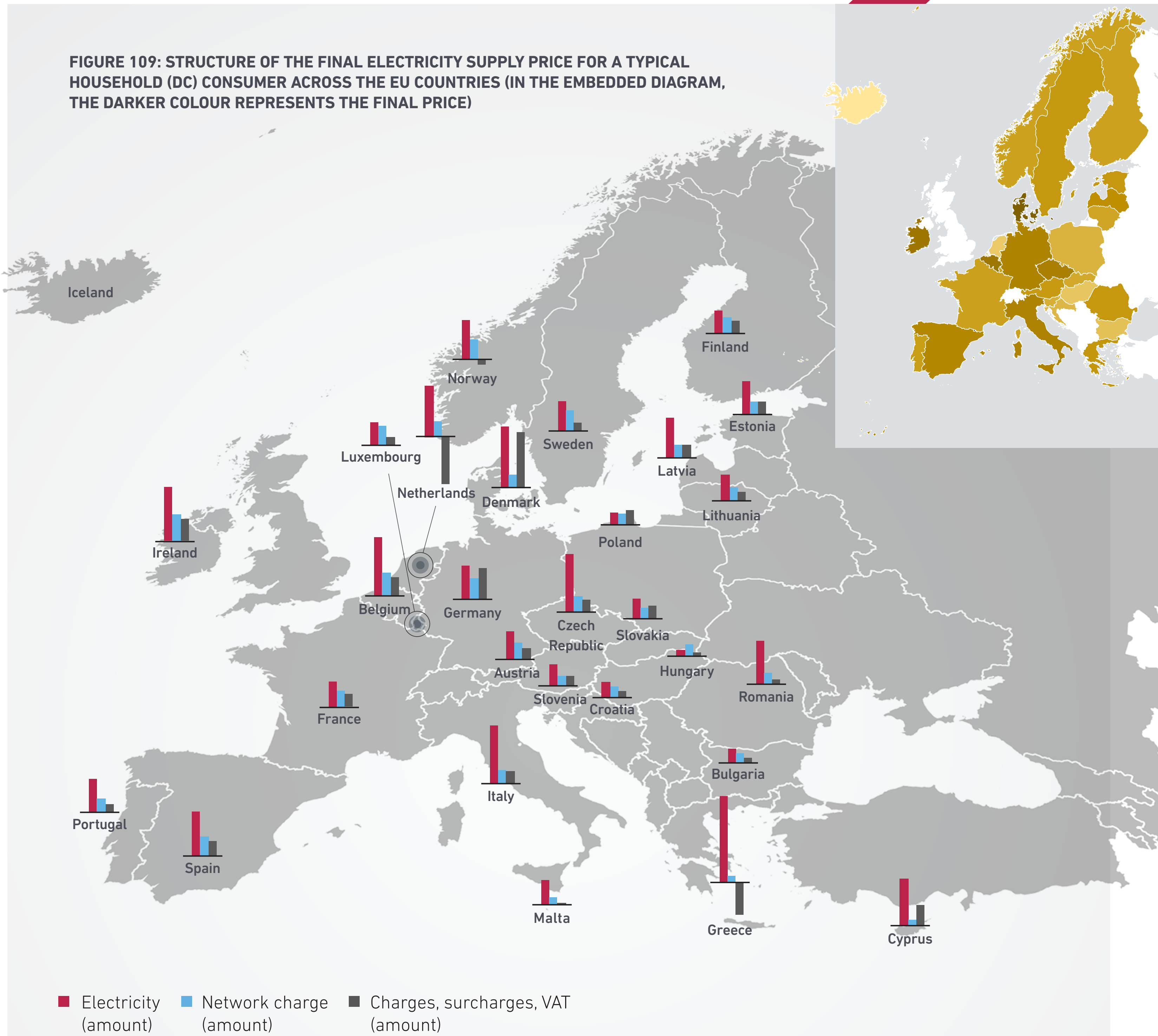
FIGURE 108: RATIO OF THE FINAL ELECTRICITY SUPPLY PRICE FOR A TYPICAL HOUSEHOLD (DC) AND BUSINESS (IC) CONSUMER IN SLOVENIA WITH REGARD TO THE EU-27 AVERAGE IN THE 2018–2022 PERIOD



SOURCE: EUROSTAT

74 Consumption profile: DC consumer, annual consumption 2,500 kWh to 5,000 kWh (household consumption) and IC consumer, annual consumption 500 MWh to 2,000 MWh (business consumption)

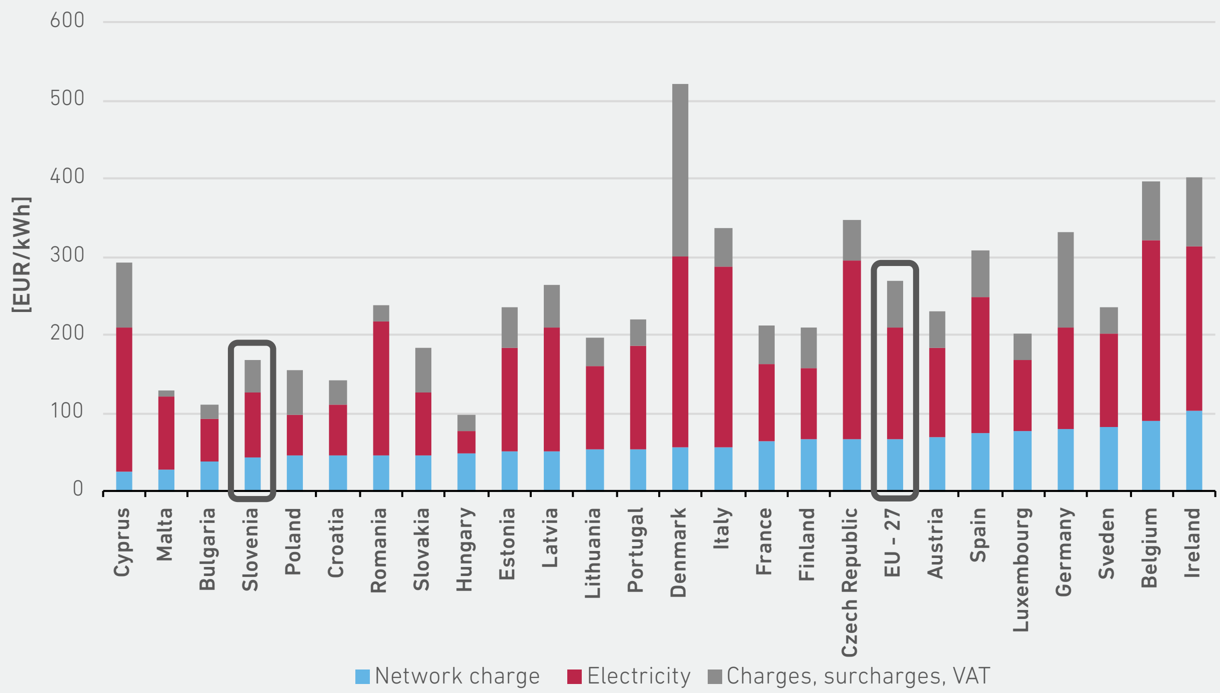
FIGURE 109: STRUCTURE OF THE FINAL ELECTRICITY SUPPLY PRICE FOR A TYPICAL HOUSEHOLD (DC) CONSUMER ACROSS THE EU COUNTRIES (IN THE EMBEDDED DIAGRAM, THE DARKER COLOUR REPRESENTS THE FINAL PRICE)



SOURCE: EUROSTAT

Due to the dynamic changing of the prices of electricity on the wholesale markets throughout 2022, the EU countries adopted emergency measures to mitigate the increase in the final prices for consumers. To maintain acceptable final supply prices, some countries opted for the direct regulation of the price of electricity (such as Hungary, Bulgaria and Malta), while others refrained from directly affecting electricity prices but rather opted for lowering taxes and other levies to mitigate the final supply price increase. The latter was most pronounced in Greece, Holland and Norway.

FIGURE 110: COMPARISON OF SHARES OF THE NETWORK CHARGE IN THE FINAL PRICE OF THE ELECTRICITY SUPPLY FOR A TYPICAL HOUSEHOLD CONSUMER IN EU MEMBER STATES



SOURCE: EUROSTAT

Mark-up and Responsiveness of Retail Prices

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

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

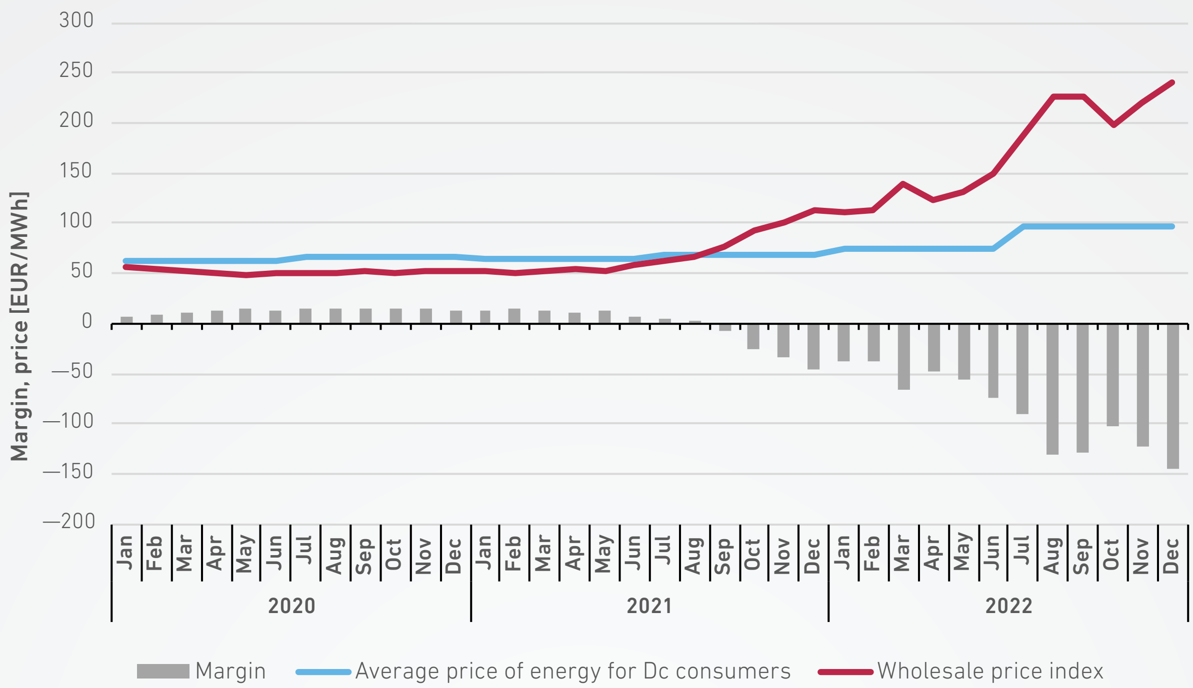
In that context, the mark-up is the difference between the price on the energy bills of a typical household consumer with an annual consumption of between 2,500 kWh and 5,000 kWh (DC consumer group) and the estimated costs of supplying that energy. To estimate the costs of energy supply, we use the wholesale price index, which is weighted to represent an approximation of the optimum strategy for energy supply in the forward and daily wholesale markets[75].

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

In 2022, the average retail margin, which in 2021 amounted to –2.8 EUR/MWh, dropped to –86.79 EUR/MWh. The impact of the increasing prices on the continuous market, the increasing prices of long-term forward contracts, and the delayed price growth for household consumers started gaining momentum in the last quarter of 2021 and continued in 2022.

75 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 111: MARGIN AND RESPONSIVENESS OF THE ENERGY COMPONENT OF RETAIL PRICES



SOURCES: ENERGY AGENCY, SURS

Figure 111 shows that the negative margin was growing throughout the better part of the year until the end of August. This negative growth is due to the mostly growing wholesale prices. In the following months, the wholesale prices dropped to the lowest level, while the negative margin remained around the same as in August. In September, the Decree on the Determination of Electricity Prices entered into force, which put a price cap on the allowed retail price. A price cap on the highest permitted retail price stopped the growth of retail prices, which prevented the transfer of relatively high wholesale prices to the retail market. Despite the fact that wholesale prices in the period from September to December were lower compared to those from late August, the price cap on the retail price maintained a relatively high negative margin. Compared to the previous year, the energy components of the retail prices for household consumption increased by 28.6% in 2022, while the wholesale price index increased by 149%. The correlation coefficient of the monthly levels of these two price elements is 0.94, indicating strong convergence, which is a consequence of the prevailing price growth trend, which has been present for some time now. Positive correlations indicate an adequate response on the retail market.

A negative margin of retail prices in all months of 2022

Dynamic Prices

Contracts based on dynamic prices have been present on the Slovenian retail market for some years now. However, with the enforcement of Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU (hereinafter: Directive EU 2019/944), they also started entering the household consumer and small business consumer segment. In 2021, the said Directive was transposed into 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, concluding 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 2022, there were five suppliers with over 100,000 consumers. These suppliers were (in alphabetical order) E 3, ECE, Elektro Energija, Energija plus and GEN-I. The continuous market monitoring, the implemented reporting procedure and the suppliers' reports showed that not all suppliers bound by applicable legislation offered household and small business consumers contracts with dynamic prices. According to the suppliers' reports, at the end of the year, contracts with dynamic prices were offered by E 3, ECE and Energija plus. Each of them had to offer one contract based on dynamic prices. At the same time, ECE was the only supplier to publish the offer containing all the necessary information based on dynamic prices. One of the suppliers to also offer contracts with dynamic prices was Suncontract, which is not bound by legislation to do so. At the end of 2022, GEN-I and Elektro energija did not offer contracts with dynamic prices to household and small business consumers, despite being required to do so by the legislation. Given that no household consumer concluded a contract based on dynamic prices in 2022, this did not have a significant impact on the market.

The data shows that in 2022, there were no contracts based on dynamic prices concluded with household consumers. On the other hand, such contracts were concluded by small business consumers. At the end of 2022, the supplier Suncontract supplied 26 small business consumers with electricity based on such contracts.

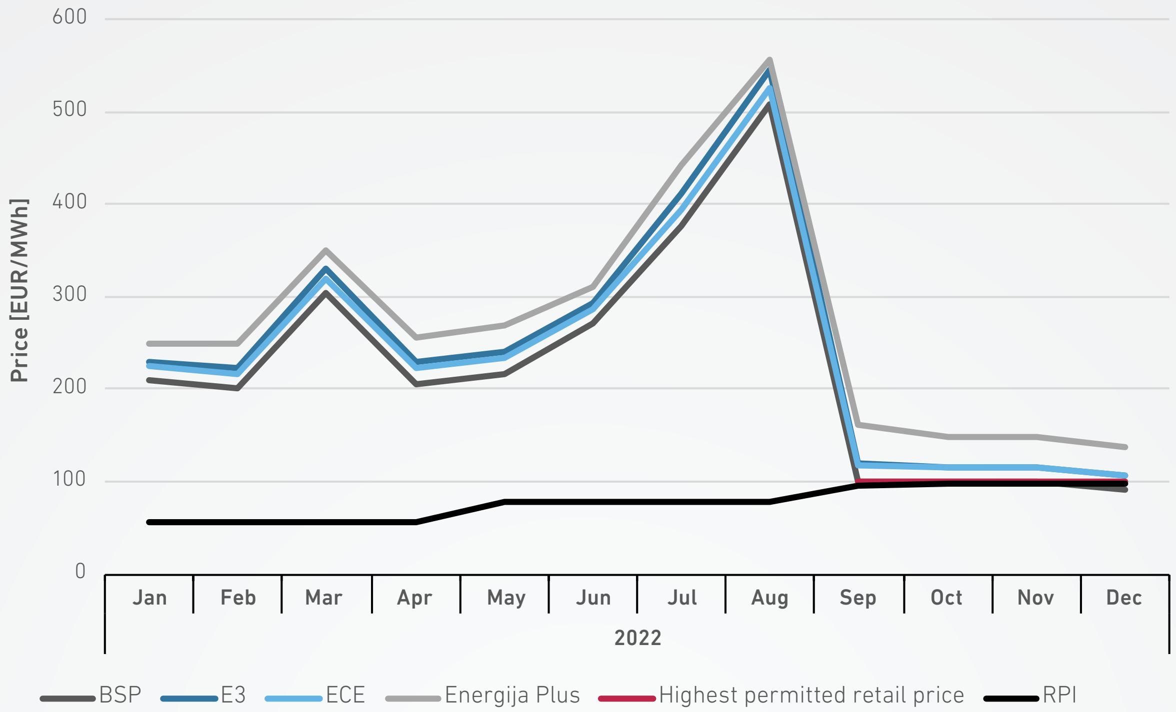
All three available offers for household consumers, which were based on dynamic prices, were linked to exchange hourly prices on the Slovenian electricity exchange BSP. These prices were increased by monthly mark-ups and mark-ups based on the quantity of supplied electricity (defined in EUR/MWh) by the suppliers, or the mark-ups were defined by the coefficient multiplying the hourly prices on the BSP exchange. The mark-ups included the seller's operational costs for forecasting and managing energy, the costs of deviations between the actual and forecast consumption of the consumer, the costs of the management of metering points, and the management of energy according to the needs of the consumer. Similarly to other offers, offers based on dynamic prices also included various support and flat-rate costs. Additionally, there were fees for the coverage of deviations. The available offers per se did not include price caps, though from September, they are subject to the Decree on the Determination of Electricity Prices, which put a price cap on the allowed retail price.

Figure 112 shows a comparison of the prices for a typical household consumer[76] if they were supplied according to one of available offers based on dynamic prices, or based on hourly prices on the BSP exchange. The Figure also includes the RPI index, 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, and the highest permitted retail price as of 1 September 2022[77]. The supply prices based on hourly prices from the BSP exchange are merely a theoretical indicator of the lowest possible supply price based on offers with dynamic prices. They differ from the suppliers' offers in that they only include the basic exchange prices without mark-ups that are included in suppliers' offers.

76 Consumption profile of an average household consumer in Slovenia: billed capacity 8 kW, 1996 kWh (peak tariff) and 2100 kWh (off-peak tariff) per year.

77 The highest permitted retail price is calculated based on the consumption profile with an annual consumption of 1,996 kWh (peak tariff) in 2,100 kWh (off-peak tariff).

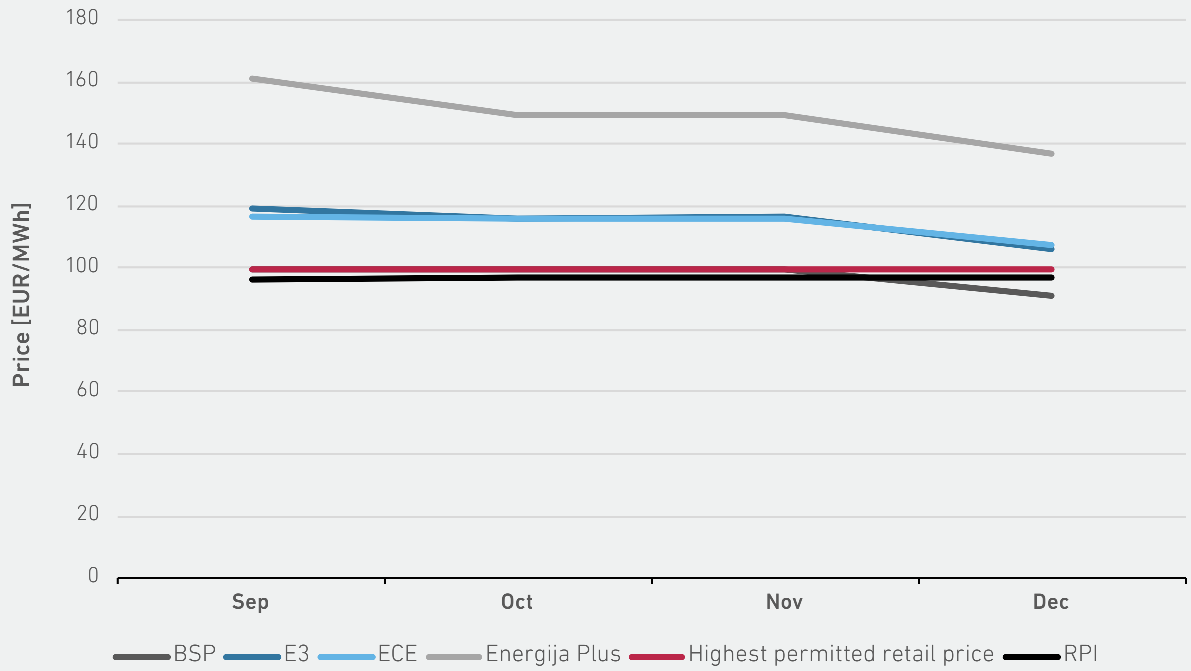
FIGURE 112: CALCULATED SUPPLY PRICES BASED ON DYNAMIC PRICES FROM THREE SUPPLIERS, BASIC DYNAMIC PRICES ON THE BSP EXCHANGE (WITHOUT MARK-UPS), THE RETAIL INDEX, AND THE RETAIL PRICES WITH A PRICE CAP FOR EACH MONTH IN 2022



SOURCES: ENERGY AGENCY, BSP

Throughout the entire 2022, the offers based on dynamic prices were less favourable for household consumers compared to the RPI. The biggest difference occurred in August, when the wholesale electricity prices were the highest. In September, the Decree on the Determination of Electricity Prices entered into force, which put a price cap on the permitted electricity retail price. Figure 113 only shows the period in 2022 in which the Decree applied. The calculation of supply prices based on dynamic prices in that period took into account the highest permitted retail price for household consumers for the higher and lower tariff. A price of 118 EUR/MWh was considered for the hours of the high tariff period when the prices were higher. A price of 82 EUR/MWh was considered for hours of the low tariff period when the prices were lower. It can be observed that the supply prices based on dynamic prices in the period in which the Decree applied moved towards the RPI but did not fall below the RPI level. The theoretical BSP indicator did fall below the RPI level, but that only included basic prices. The supply prices based on dynamic prices exceeded the highest permitted retail price for household consumers due to the suppliers' mark-ups. The supply price based on dynamic prices remained above the highest permitted retail price for household consumers in the first quarter of 2023, which hinders the interest of household consumers in contracts with dynamic prices.

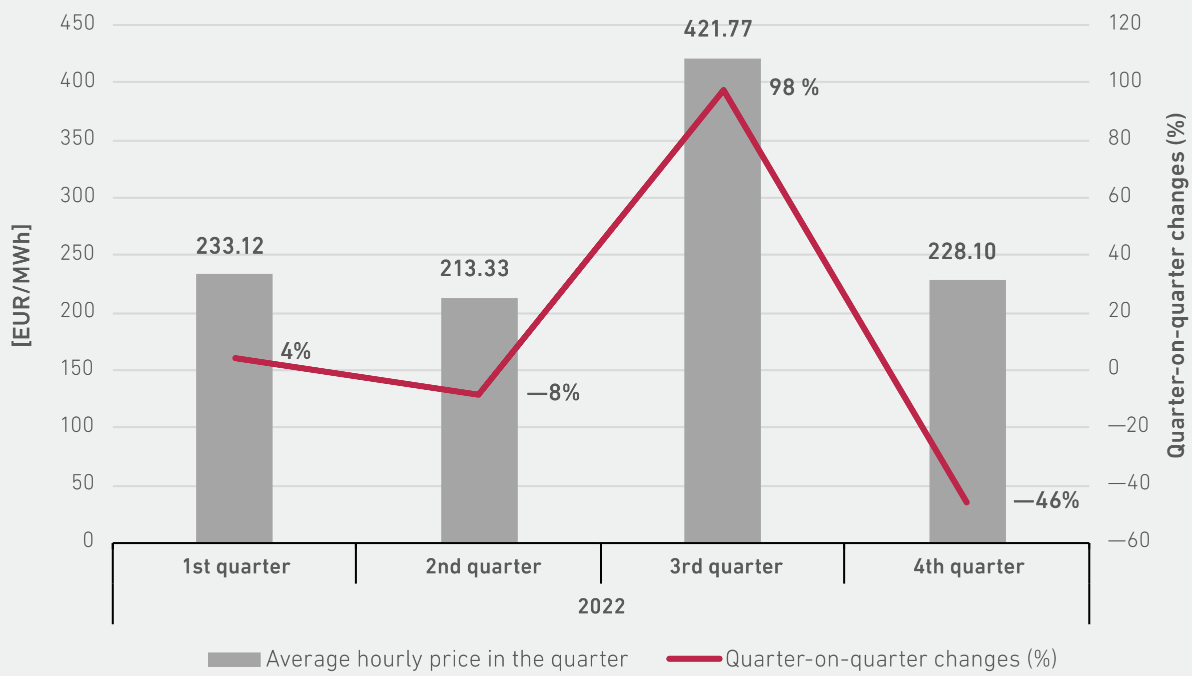
FIGURE 113: CALCULATED SUPPLY PRICES BASED ON DYNAMIC PRICES FROM THREE SUPPLIERS, BASIC DYNAMIC PRICES ON THE BSP EXCHANGE (WITHOUT MARK-UPS), THE RETAIL INDEX, AND THE RETAIL PRICES WITH A PRICE CAP IN THE PERIOD SINCE THE HIGHEST PERMITTED RETAIL PRICE WAS ENFORCED



SOURCES: ENERGY AGENCY, BSP

The hourly prices on the Slovenian electricity exchange BSP, which were the basis for all available offers, fluctuated considerably in 2022. Figure 114 shows the average hourly prices reached on the BSP exchange in particular quarters of 2022, and the quarter-on-quarter changes in average hourly prices.

FIGURE 114: THE AVERAGE HOURLY PRICES REACHED ON THE BSP EXCHANGE IN PARTICULAR QUARTERS OF 2022 AND QUARTER-ON-QUARTER CHANGES



SOURCES: ENERGY AGENCY, BSP

Table 27 shows the lowest and highest hourly price on the BSP electricity exchange and the difference between the two in particular months of 2022. On the annual level, the lowest hourly price amounted to 0.003 EUR/MWh, and the highest price amounted to 879.29 EUR/MWh. The standard deviation[78] by days in 2022 spanned from 13 EUR/MWh to 136.9 EUR/MWh. The standard deviation on the sample of all hours was 137 EUR/MWh.

TABLE 27: THE LOWEST AND THE HIGHEST HOURLY PRICE ON THE BSP EXCHANGE AND THE DIFFERENCE IN PARTICULAR MONTHS OF 2022 IN EUR/MWh

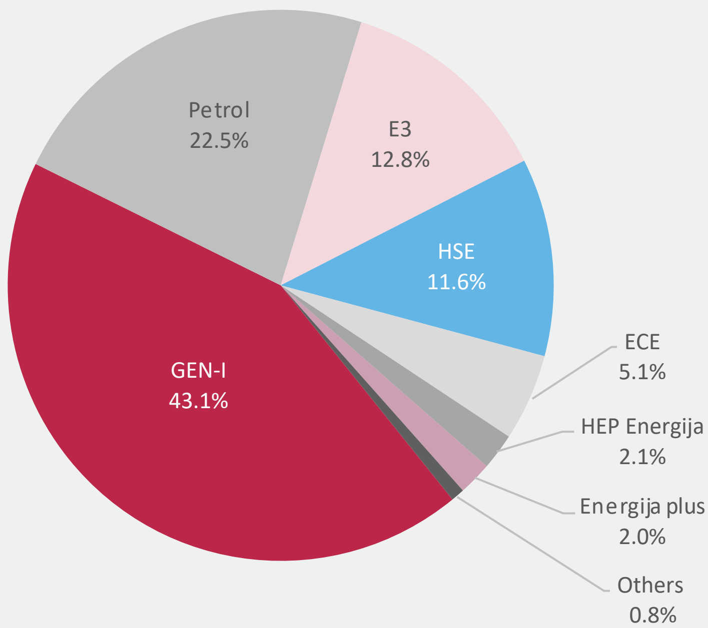
	The lowest hourly price	The highest hourly price	Difference
Jan.	7.07	399.46	392.39
Feb.	60.01	349.00	288.99
Mar.	81.40	700.00	618.60
Apr.	0.00	450.05	450.05
May	10.00	360.00	350.00
Jun.	23.46	479.00	455.54
Jul.	33.21	689.10	655.89
Aug.	86.82	879.29	792.47
Sep.	41.18	746.92	705.74
Oct.	67.26	556.14	488.88
Nov.	68.37	503.55	435.18
Dec.	0.01	665.01	665.00

SOURCES: ENERGY AGENCY, BSP

In 2022, business consumers were supplied with 1.33 TWh of electricity based on contracts with dynamic prices. Compared to the year before that, 23% less electricity was supplied to business consumers based on this type of contract. This may partly be due to the fluctuations in wholesale prices. Consequently, some consumers signed electricity supply contracts with previously agreed prices to mitigate the risks of unforeseen costs due to price fluctuations on the wholesale market. In 2022, 10 suppliers concluded contracts based on dynamic prices with 180 business consumers. Figure 115 shows the shares of electricity sold on the basis of contracts with dynamic prices in 2022.

78 Standard deviation is the dispersion of a value around the average.

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



SOURCE: ENERGY AGENCY

Transparency

Financial Transparency of Suppliers, Transparency of Invoices and the 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.

In December 2022, the Energy Agency put the proposal for the Legal Act on the method for presenting information on electricity bills and additional clarification for public hearing. The Act came into force in early 2023 and ensured a suitable systemic framework for the transparency of electricity bills. It needs to be acknowledged that in 2022, the framework legislation from this field ensured a minimum level of transparency even without a specific regulatory framework. In fact, the suppliers' bills display a breakdown of the costs of electricity, the network charge, levies, excise duty and VAT. In addition, the bills include information on the structure of primary electricity sources, carbon dioxide emissions and the resulting radioactive waste. The implemented reform of the tariff system for the network charges brings a greater complexity of the tariff for the use of the network. Further complexity arises due to the implementation of the Clean Energy for All Europeans package, which obliges certain suppliers on the retail market to provide final consumers with supply products based on dynamic energy prices, connected to the wholesale prices, e.g. the prices on the day-ahead market. Contributing to the further complexity of the information on the bill may be other, innovative energy services. These novelties represent a new challenge for suppliers, who are especially concerned with how to design combined bills for electricity supply and network use, and to ensure transparency and clarity of the bills. The fact is that detailed information about the services subject to charges will have to be provided with suitable 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 provide final consumers with clear information and a detailed analysis of the charged quantities.

As in previous years, suppliers had to provide household consumers and small business consumers with transparent information on their offer of electricity supply and the related price lists in 2022, as well as the general terms and conditions for their supply services, at least by publishing this information on their website. At the same time, this information serves as input data for comparison services, used to compare supply costs for electricity and natural gas, which by law, are provided by the Energy Agency.

Guarantees of the Origin of Electricity

A guarantee of origin is a document issued by the Agency at the request of a producer of electricity. This document enables traceability and serves as the proof of provenance of certain electricity. Guarantees of origin are particularly important for consumers, since they prove the origin of the supplied electricity. They are also important from the suppliers' point of view, because they use it 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 electricity. Additionally, it includes data on the origin of electricity and the quantities of produced electricity for which the guarantee is issued, the data on the producers, the production facility, and the information about the support for the produced electricity and production period. The guarantees of origin and transactions, as well as their cancellation, are issued electronically in the register of guarantees of origin. With its cancellation, the guarantee of origin is used and serves as proof for suppliers and consumers of the source of the electricity supplied. For electricity produced in 2022, 11,315 GWh guarantees of origin were issued, 3,291 GWh of which were issued for electricity from RES and 5,311 GWh for electricity from nuclear energy (the guarantees of origin are issued for the entire quantity of electricity from Krško NPP). The remaining guarantees were issued for electricity generated from fossil fuels. To prove the origin of electricity on the domestic market, 4,368 GWh of guarantees of origin were cancelled, 1,648 of which were for RES. 3,487 GWh of guarantees of origin for electricity were transferred to other EU member states (3,337 GWh of which was electricity from RES), while 2,076 GWh of guarantees of origin (of which 1,856 GWh for electricity from RES) were transferred from other EU members to Slovenia where they were or will be cancelled.

Ensuring Retail Market Transparency

Transparency in the retail market, where numerous participants offer a very wide and diverse range of services, is ensured in particular by making all the necessary information publicly available. Suppliers publish information about their offers and products, as well as the terms and conditions related to their services, on their websites. After the implementation of the Clean Energy for All Europeans package, increased development of the retail market is expected to occur, which was at least temporarily halted by the energy crisis and the price regulations. Despite this, the retail market saw the emergence of new business models with flexibility on the consumer side and products based on dynamic prices of electricity supply. Also due to a relatively slow development of electromobility in 2022, no new business model based on split supply has been implemented. Once the energy crisis and the price regulation period are over, the offer will diversify and new participants will enter the market. Regardless of the poor development, there is a lot of information that is important in terms of transparency, though this information is very scattered. In accordance with the applicable legislation, transparency is being ensured by the Energy Agency and the market operator Borzen.

The monitoring process is carried out based on public and other data that the Energy Agency obtains from persons with a reporting obligation. Based on the results of monitoring, reports on violations or restrictive practices, etc., the Energy Agency carries out surveillance activities and implements measures whose aim is to provide transparency. The Energy Agency contributes to transparency by publicly publishing information and services at its single point of contact[79], which comprise comparison and validation e-services, including a list of suppliers and electricity system operators, which includes the identity cards of individual companies, key indicators in energy markets (eMonitor portal[80]), 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.).

79 https://www.agen-rs.si/skt/ee
80 https://www.agen-rs.si/web/emonitor

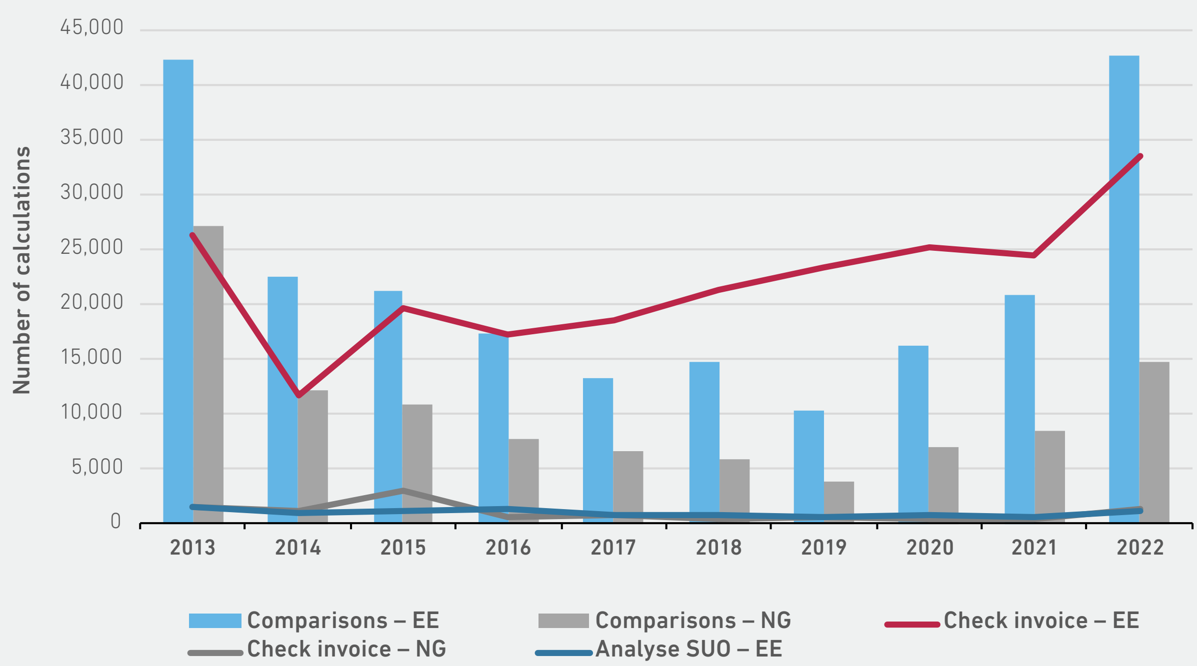
The set of comparison e-services enables users to calculate and compare the costs of electricity supply according to individual consumption types. Comparative calculations can be carried out for the supply to household and small business consumers. Suppliers submit information about their offers to the Energy Agency in a standard format on a monthly basis in accordance with the Act concerning the method of electronic data reporting for valid regular tariff comparison of electricity and natural gas suppliers for household and small business consumers. The web application Check Your Monthly Bill enables consumers to verify the accuracy of the issued monthly electricity bill according to the selected supplier, supply offer and type of consumption. This calculation is performed separately according to the bill's legally required items and it is possible for all products on the market, though it does not support checking balance payments. As part of its comparison services, the Energy Agency enables users to make a comparative calculation of the costs for the use of the network (SUO) for all consumer groups according to the user's consumption type (the app Calculate the Costs for the Use of the Network).

An independent comparison of all the offers on the market in one place fundamentally contributes to more transparent offers in the retail market. As part of its comparison services, the Agency provided comparisons of all the offers on the retail market in 2022 as well, with individual exceptions: only individual offers from suppliers whose design or characteristics did not ensure a minimum level of comparability or that would distort the comparison, or had a very specific design that prevented their comparison due to systemic limitation, were excluded.

A 10-year record in the number of comparisons carried out for electricity supply

An analysis of the number of comparisons and invoice verifications performed confirms the significantly increased interest of consumers: the number of comparisons carried out has increased by no less than 105% (electricity supply) and 73% (natural gas supply) compared to 2021. At the same time, the number of consumers who carried out comparisons increased by 87% for electricity supply and 158% for natural gas supply.

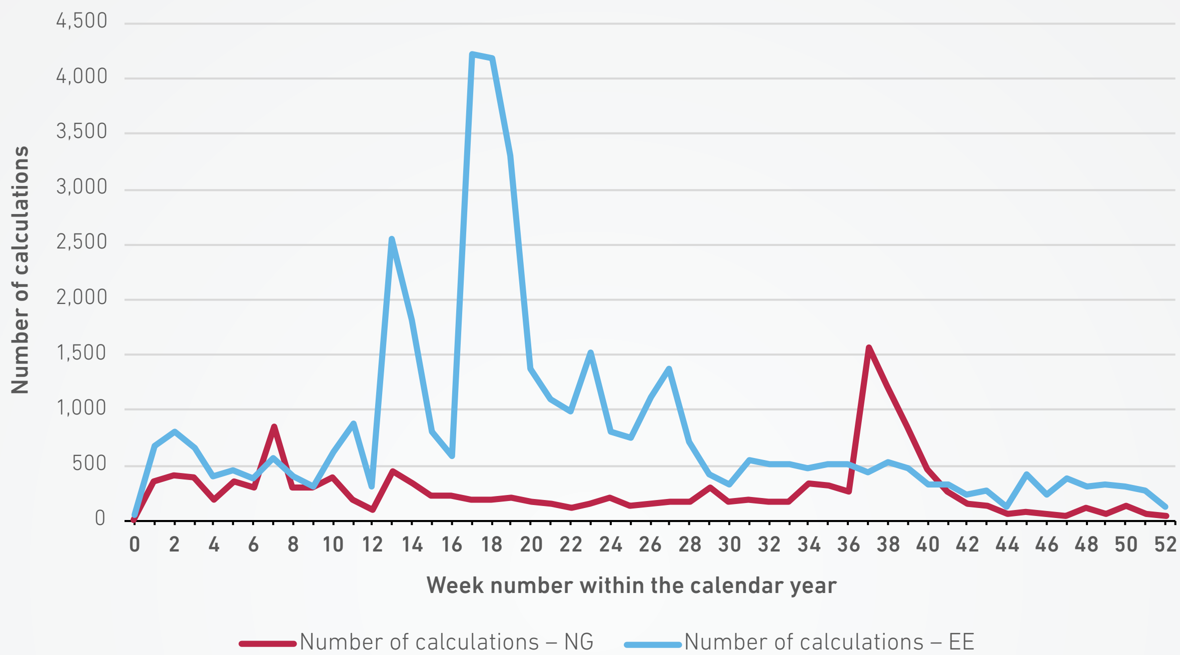
FIGURE 116: ANALYSIS OF THE NUMBER OF COMPARISONS CARRIED OUT AS PART OF THE AGENCY'S SERVICE



SOURCE: ENERGY AGENCY

As shown in Figure 117, the factors motivating consumers to use the comparison services of the Agency were the impact of the energy crisis, the consumers' response to some suppliers exiting the market (see the chapter Supplier Switching), and the increased awareness of the consumers regarding the developments on the market. As expected, the interest in the comparison services dropped significantly once the price regulation had been introduced and the natural gas market had stabilized.

FIGURE 117: ANALYSIS OF THE NUMBER OF COMPARISONS CARRIED OUT FOR ENERGY SUPPLY ON A WEEKLY BASIS IN 2022



SOURCE: ENERGY AGENCY

Due to the end of the service life of the existing solution, the Energy Agency carried out a project to renovate the comparison services and ensure compliance with the Clean Energy for All Europeans package and CEER recommendations. The key novelty and challenge in the area of comparison services will be to support the comparison of offers on the basis of dynamic tariffs and, later, flexibility products. The renovation addresses the shortcomings and limitations of the current solution and provides consumers with a better user experience. The introduction of the new solution will be postponed until 2023 due to the interventions on the market (changes in the amount of levies etc.), which required the solution to be upgraded, and the unsatisfactory level of definition of the energy supply products based on dynamic prices (despite the Agency's measures). Given the significant drop in interest in comparison services due to electricity and natural gas retail price regulation, the postponed introduction of the new solution will not have a significant negative impact.

Borzen established the Sustainable Energy web portala[81] with the aim of creating an information hub, a contact point for access to information on the efficient use of energy and RES in Slovenia. It brings together in one place, in a simple and transparent way, high-quality and expert information that helps consumers use energy more efficiently, while also serving an educational purpose, with the aim of raising awareness of the benefits of RES and their use. While not directly related to the retail market, the information published helps, among other things, to raise awareness among consumers 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 regarding investing in RES, storage devices, energy-saving devices or smart devices.

81 https://www.trajnostnaenergija.si/

CASE STUDY
New Challenges and Barriers in Ensuring Transparency in the Billing of Innovative Energy Services to Final Customers

New business models and services in the retail market bring new challenges in the area of billing final consumers.

Prior to the implementation of the package of EU directives, the billing of the network charge and electricity supply was harmonised in terms of time slots (high tariff, low tariff or single tariff) and chargeable interval (monthly). However, new products on the retail market, such as dynamic pricing or the reformed network charge methodology with a new tariff system, or other innovative products on the retail energy market, bring about more extensive time-variable pricing (TVP), as well as in terms of different and shorter chargeable intervals. The provision of flexibility services, where certain products require measurements at the sub-second level, linked to activations that are flexible according to market conditions or the operational state of the network in real-time may further add to the complexity.

In terms of ensuring transparency, at least two challenges need to be highlighted:

- structuring the data on the joint invoice for network use and electricity supply services,
- ensuring that detailed accounting data is available to the final consumer.

The established data exchange between the DSO and the suppliers is limited to the accounting aggregates under the three existing tariff slots (high tariff, low tariff and single tariff) and does not yet include the 15-minute accounting data needed to allocate volumes to the second type of time granulation. Therefore, the calculation of the cost of this type of service is only possible with the installation of an appropriate submetering device, which represents an additional cost for the final consumer or supplier. The field of submetering has not yet been comprehensively regulated (updating the SONDSEE). In the retail market, only one business model based on the use of data from submetering was identified in 2022 (NGEN provider). By amending its general acts, the Agency has removed certain normative obstacles that prevented the effective implementation of business models based on energy metering closer to real-time.

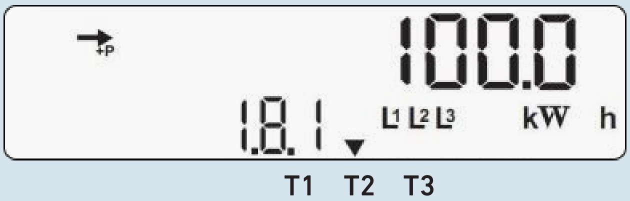
The metrologically verified display on a conventional smart meter installed at the delivery point of a final consumer in Slovenia is limited to four or six time slots. Therefore, in the period of development of new innovative tariff models and services, it is no longer able to serve its purpose as defined in Directive 2014/32/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to making measuring instruments available on the market[82] or in the Rules on measuring instruments (hereinafter referred to as the MID). In the Member States, data services are used to access detailed billing information and are provided on appropriate data hubs in a structured, transparent and user-friendly manner. The same role has to be assumed in Slovenia by the national data hub[83], which, however, needs to be upgraded with appropriate data services for the users of the system, in particular with the possibility of accessing 15-minute accounting data.

82 Annex I, Paragraph 10.5.

83 »The National Data Hub Single Entry Point« is a single information system for access to the metering and accounting data of users in the Republic of Slovenia, which can be accessed by users, authorised third parties and other persons with access to data on the basis of the Electricity Supply Act.

FIGURE 118: DISPLAY OF DATA ON CONSUMPTION AND TIMESTAMPS ON AN LCD SCREEN OF A CONVENTIONAL SMART METER (LIMITED TO 6 TIME SLOTS (T1 TO T6) OF WHICH THREE ARE USED FOR THE HIGH TARIFF, LOW TARIFF AND SINGLE TARIFF)

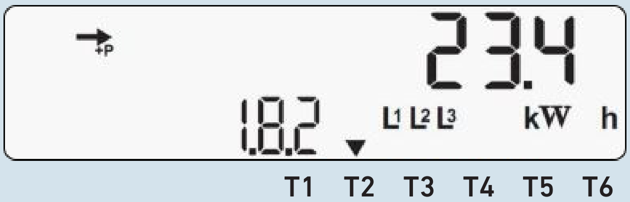
Display of energy consumed during T1 – VT (peak tariff):



1.8.1 – Display of energy consumed during T1 (VT – peak tariff), in this case 100.0 kWh

The arrow indicates that the T2 tariff is currently active

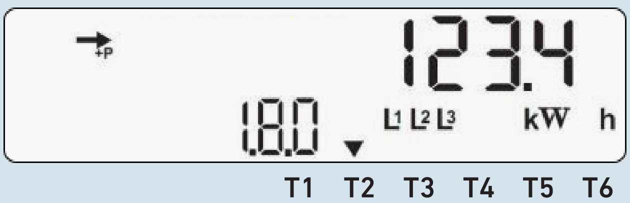
Display of energy consumed during T2 – MT (off-peak tariff):



1.8.2 – Display of energy consumed during T2 (MT – off-peak tariff), in this case 23.4 kWh

The arrow indicates that the T2 tariff is currently active

Display of total energy consumed:



1.8.0 – Display of the total energy consumed, in this case 123.4 kWh

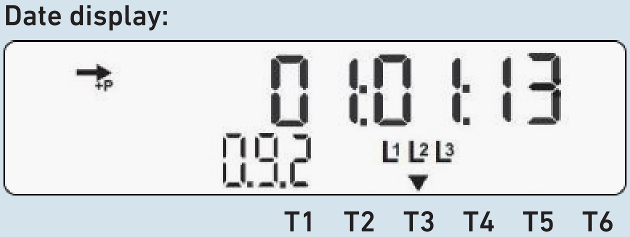
The arrow indicates that the T2 tariff is currently active

Time display:

0.9.1 – the meter is displaying the time.
Example: 01:01:10.
From left to right: (hour:minutes:seconds) (hh:mm:ss)

The arrow indicates that the T3 tariff is currently active

Date display:

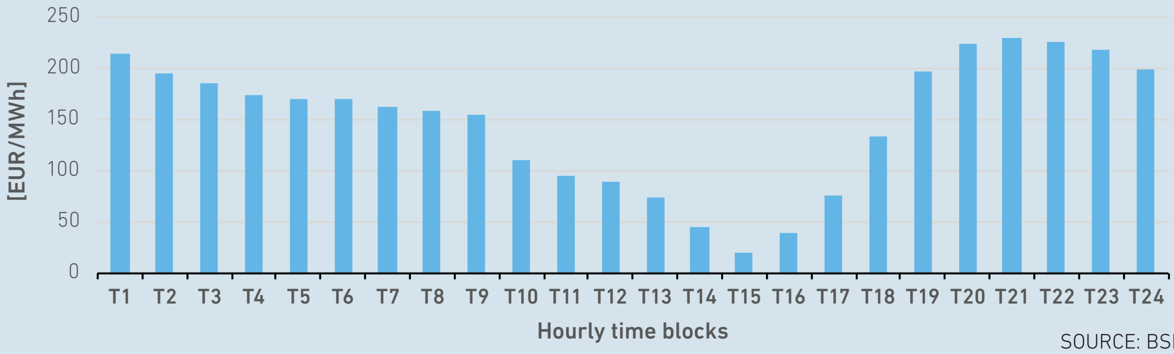


0.9.2 – the meter is displaying the date.
Example: 1.1.2013.
From left to right: (day:month:year) (dd:mm:yy)

The arrow indicates that the T3 tariff is currently active

SOURCES: ENERGY AGENCY, SODO

FIGURE 119: PRICES IN EUR/MWh IN THE BSP DA MARKET ON 15 MAY 2022, WHICH ACCORDING TO THE MID, REQUIRE THE DISPLAY OF DATA IN 24 DIFFERENT TARIFF SLOTS CORRESPONDING TO THE HOURLY PRICES ON THE WHOLESALE MARKET (HOURLY BILLING INTERVAL)



SOURCE: BSP

The final consumer, who is billed for the above services, can only use the information from the display of the smart meter to control the total consumption, while it is no longer possible to read the consumption by individual time slots due to the technical limitations of the metering devices. While it is theoretically possible to capture consumption data at the level of 15-minute intervals and then perform manual validation of the distribution of quantities across time slots, this requires recording the display screen over a month and time-consuming manual processing of the data, which is a task too demanding for the average user. Moreover, the display of the smart meter is often inaccessible or does not allow the reading of quantities due to degradation of the materials of the junction boxes caused by the weather. Thus, according to the 2022 REUS survey[84], only 25% of households still use the meter display to check the quantities, and it is not their only source of information on consumption.

According to the Agency, dynamic pricing is implicitly implemented in the framework of the NGEN business model mentioned above, but explicitly linked to wholesale prices only in the business customer market segment. In 2022, no households have yet been supplied with energy on the basis of dynamic prices under the Clean Energy for All Europeans (CEP) package, partly due to the extremely high prices and price regulation as one of the government's intervention measures.

Currently, the only effective solution to this problem, which is also well-established through good practices in the EU, is the verification of billed consumption by accessing the necessary data in the national data hub (the mojelektro.si web portal). However, validated accounting data at the 15-minute level for the previous month or day in the period under review is not yet available there. It is also necessary to provide appropriate data analysis services to adequately support the requirements of the new method of calculation the network charge.

The unsatisfactory situation is also related to the problem of the processing of massive metering data, a task of the SODO public service company, which is addressed in the case study »Scope and Quality of Data Processing Provided in the Framework of the NMS«.

The potential conflict between the provisions of the CEP, which requires a transition to a dynamic calculation of the network charge and the maximum utilisation of consumption flexibility, and the MID regarding the requirements on the display of metering results on the metering device, needs to be properly resolved at the national level in cooperation with the competent ministries and the Energy Agency, taking into account the broader aspects of the green transition and ensuring adequate consumer protection. Appropriate action by the European Commission is also expected. The new Commission's latest proposal for the reform of the market model[85] for submetering further confirms the conclusion that the MID needs to be updated in accordance with the market developments.

This is also linked to the problem of structuring the information in the joint bills for energy supply and the use of the network, which are becoming increasingly complex and consequently non-transparent/unintelligible as a result of uncoordinated time slots. At the end of the year, the Agency held a public debate on a proposal for a general act regulating the minimum requirements for the inclusion of information on the invoice. It is foreseen that more detailed information on the billed consumption related to the SODO services (including flexibility) will be provided to the user through the mojelektro.si portal, and the rest of the information will of course be provided through comparable systems managed by the service providers.

Developments in this area can be expected in 2023, when the conditions for the implementation of the tariff reform for network charges should be in place.

84 https://porocila.reus.si/porocila-raziskave-reus-gos/
85 https://ec.europa.eu/commission/presscorner/detail/en/IP_23_1591

Market Effectiveness

Monitoring of the efficiency and competitiveness of the retail market is carried out on the basis of continuous data collection from market participants and public data aggregators. Based on the data on electricity volumes charged by suppliers to final consumers, the market shares of suppliers in individual market segments and their changes compared to 2021 are shown below.

Market Shares and Concentration in Retail Markets

Electricity Supply to all Consumers

Table 28 shows the market shares of suppliers according to their electricity supply, taking into account the supply in the entire retail market, which also includes large final consumers connected to the transmission system and closed distribution systems. An HHI above 2000 indicates a highly concentrated retail market, while an HHI below 2000 indicates a market with a low level of concentration. Compared to 2021, when it was 1259, the HHI saw a slight increase to 1273.

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

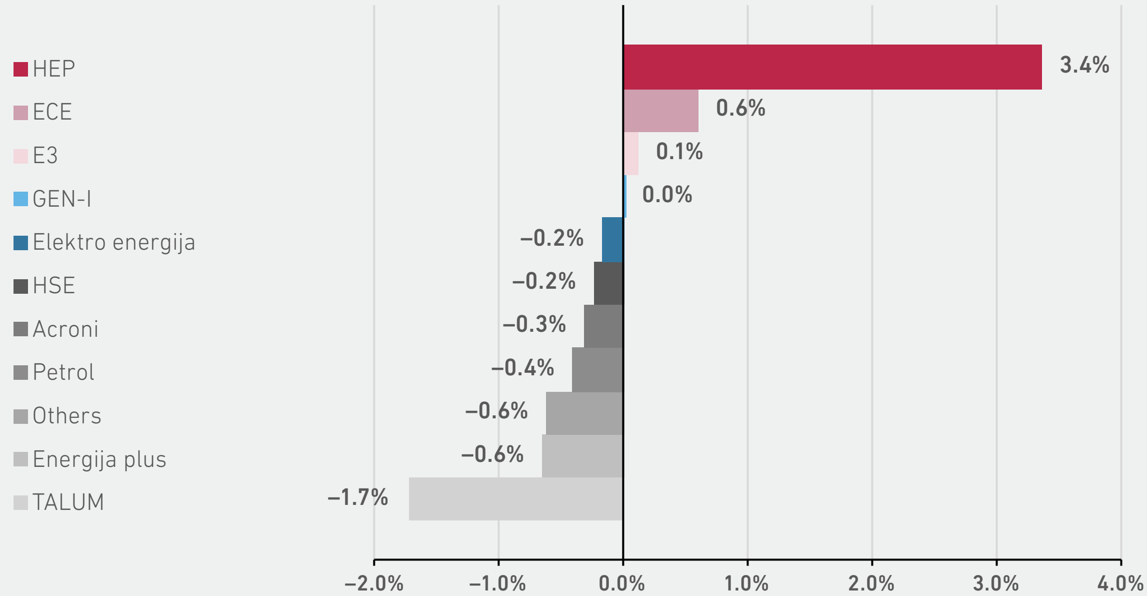
SUPPLIER	Supplied Electricity [GWh]	Market Shares
GEN-I	2,685.0	20.7%
ECE	1,963.8	15.2%
Petrol	1,864.0	14.4%
Energija plus	1,515.6	11.7%
E 3	1,485.8	11.5%
HEP	1,054.9	8.1%
Elektro energija	631.4	4.9%
Others	552.8	4.3%
HSE	546.7	4.2%
TALUM	342.0	2.6%
Acroni	315.2	2.4%
Total	**12,957.1**[86]	**100%**
HHI of suppliers to all final consumers	**1,273**	

SOURCE: EPOS PORTAL

In comparison with the preceding year, the market share that increased the most in 2022 was that of HEP. On the other hand, the greatest loss of market share in 2022 was recorded by TALUM, who thus continued their trend of reducing electricity consumption, which has been present since 2019. In terms of the sizes of the changes, the market shares of other suppliers in 2022 did not deviate considerably from the previous years, meaning that their market positions did not change significantly, as shown in Figure 120.

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

FIGURE 120: CHANGES IN MARKET SHARES OF SUPPLIERS TO ALL FINAL CONSUMERS IN 2022 COMPARED TO 2021[87]



SOURCE: EPOS PORTAL

Electricity Supply to Business Consumers

Table 29 shows the market shares of electricity suppliers in the retail market to business consumers in 2022. The retail market for business consumers continued registering low market concentration in 2022. The HHI was 1188, which is a slight fall compared to 2021, when it was 1193.

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

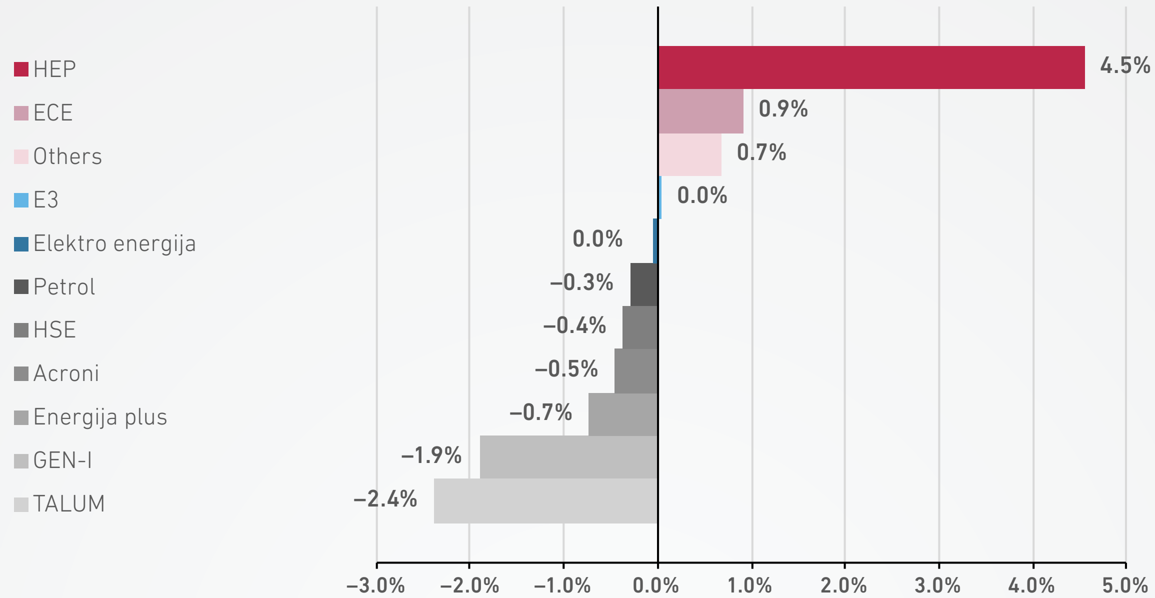
SUPPLIER	Supplied Electricity [GWh]	Market Shares
Petrol	1,522.1	16.0%
GEN-I	1,480.0	15.6%
ECE	1,460.7	15.4%
Energija plus	1,090.5	11.5%
HEP	1,054.9	11.1%
E 3	1,000.7	10.5%
HSE	546.7	5.8%
Others	484.1	5.1%
TALUM	342.0	3.6%
Acroni	315.2	3.3%
Elektro energija	208.8	2.2%
Total	**9,505.7**	**100%[88]**
HHI of suppliers to business consumers	**1,188**	

SOURCE: EPOS PORTAL

87 Changes in the market shares of suppliers in 2022 compared to 2021 are rounded to one decimal place.
88 The difference between the total and the sums of individual suppliers is due to rounding to one decimal place.

As shown in Figure 121, the largest market share in this segment compared to 2021 was gained by HEP. The greatest loss of market share compared to 2021 was recorded by GEN-I and TALUM.

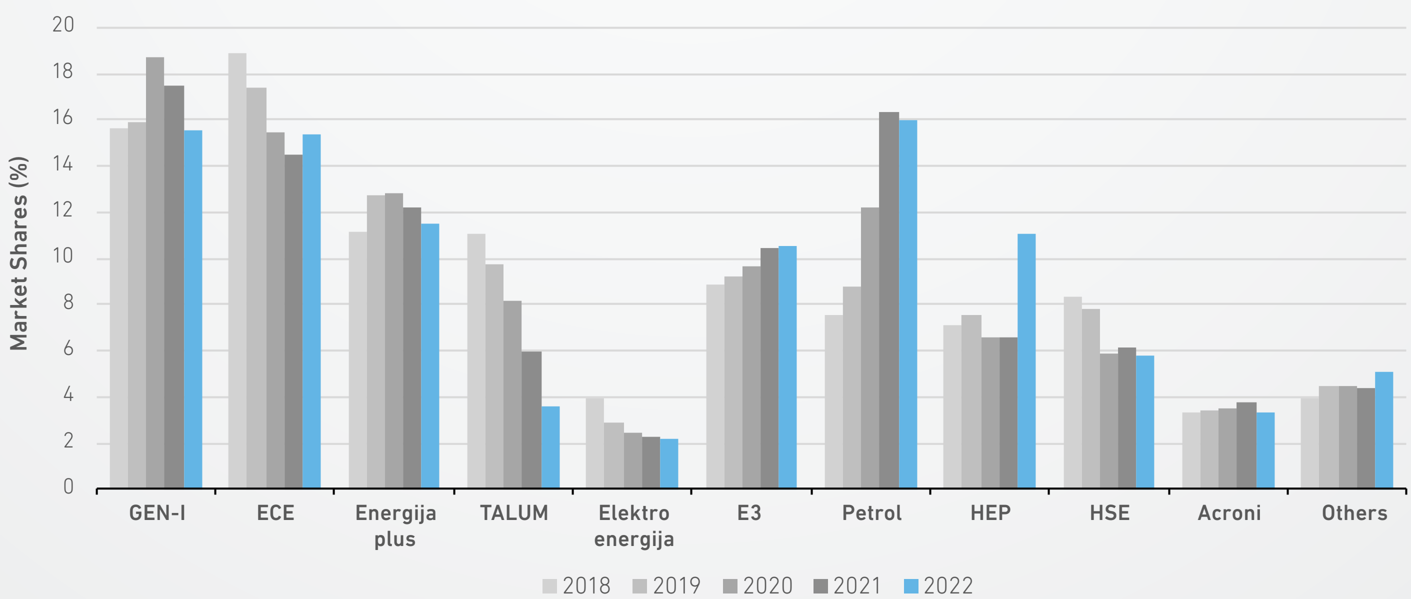
FIGURE 121: CHANGES IN THE MARKET SHARES OF SUPPLIERS TO BUSINESS CONSUMERS IN 2022 COMPARED TO 2021[89]



SOURCE: EPOS PORTAL

Figure 122 shows the five-year evolution of the market shares of suppliers to business consumers. GEN-I, Energija Plus, TALUM and Elektro energija have been losing their market shares in this segment in recent years, while E3 and other smaller suppliers have been increasing their market shares. After three consecutive years of market share loss in the 2019–2021 period, ECE increased their market share in 2022, while Petrol lost part of theirs in 2022 after several years of market share gain.

FIGURE 122: COMPARISON OF THE MARKET SHARES OF SUPPLIERS TO BUSINESS CONSUMERS IN THE 2018–2022 PERIOD



SOURCE: EPOS PORTAL

89 Changes in the market shares of suppliers in 2022 compared to 2021 are rounded to one decimal place.

Electricity Supply to Household Consumers

The 2022 market concentration in the retail market for household consumers indicated that this was a highly concentrated market. The HHI exceeded 2000, reaching 2033. Compared to 2021, when it was 1725, the HHI saw an increase of 17.9%.

A considerable increase in market concentration in the retail electricity market for household consumers

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

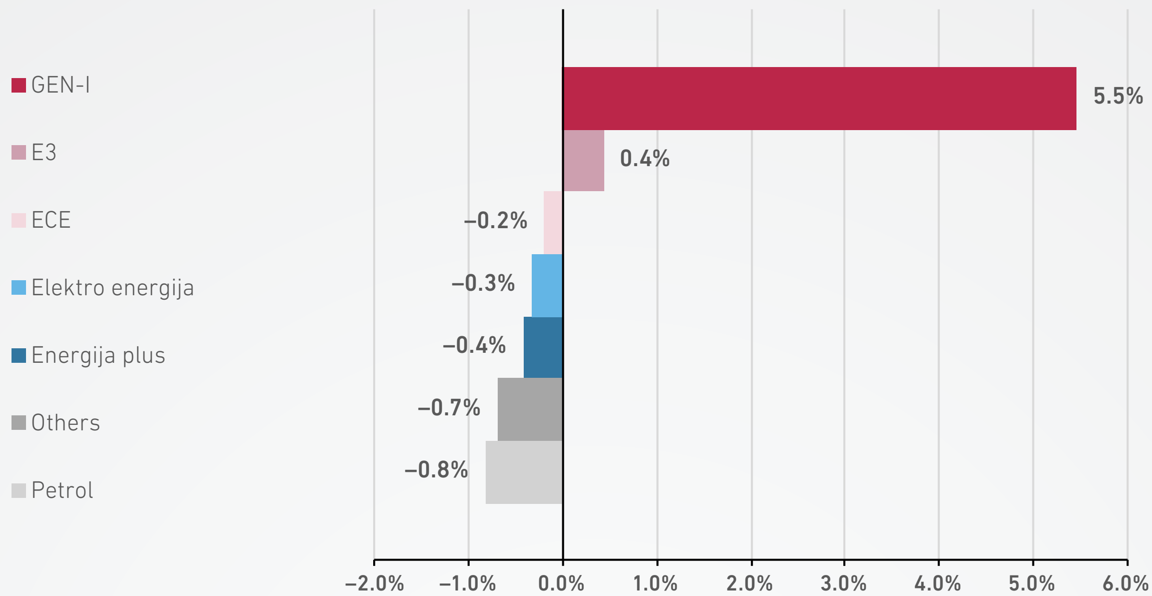
SUPPLIER	Supplied Electricity [GWh]	Market Shares
GEN-I	1,205.0	34.9%
ECE	503.2	14.6%
E 3	485.1	14.1%
Energija plus	425.1	12.3%
Elektro energija	422.6	12.2%
Petrol	341.9	9.9%
Others	68.7	2.0%
Total	**3,451.5**[90]	**100%**
HHI of suppliers to household consumers	**2,033**	

SOURCE: EPOS PORTAL

Compared to 2021, the largest increase in market share in the household consumption segment in 2022 was recorded by GEN-I, namely 5.5 percentage points, as shown in Figure 123. The relatively large increase in the GEN-I market share is largely due to exits by suppliers from the retail electricity market, as a large part of the customers previously supplied by those suppliers decided to sign supply contracts with GEN-I. The market share of the three largest suppliers was 63.5% and has increased by 5.7 percentage points compared to 2021. The greatest loss of market share compared to 2021 was recorded by Petrol and other smaller suppliers. The loss of market share by other smaller consumers is also a consequence of the cessation of supply from several suppliers in 2022.

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

FIGURE 123: CHANGES IN THE MARKET SHARES OF SUPPLIERS TO HOUSEHOLD CONSUMERS[91]

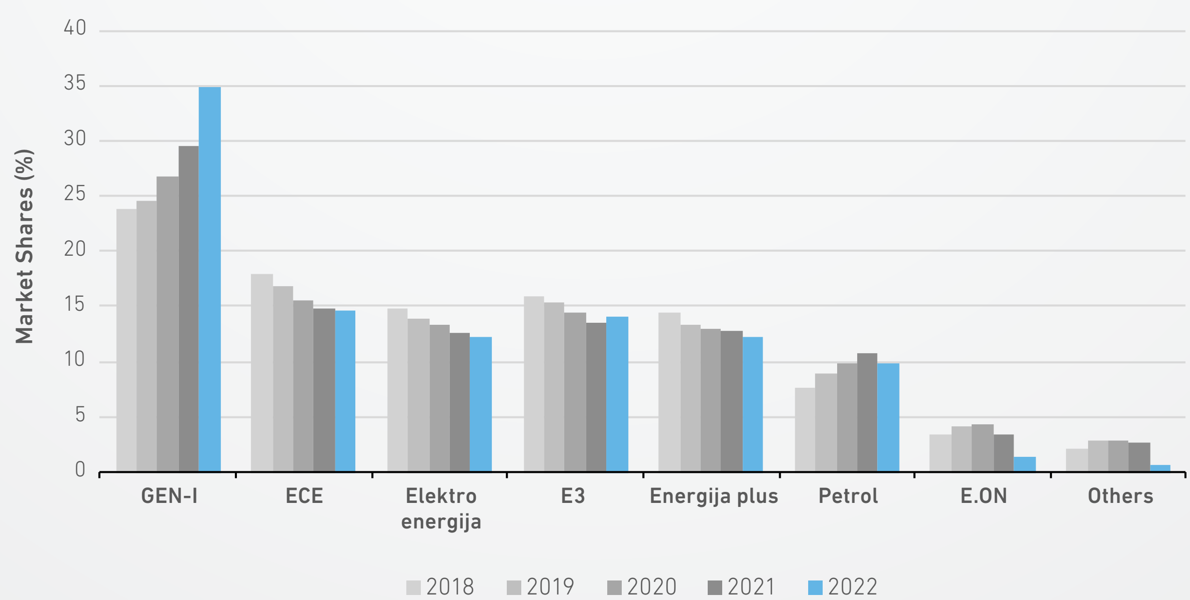


SOURCE: EPOS PORTAL

Figure 124 shows the market shares of suppliers to household consumers. It presents their market shares in the 2018–2022 period. In this five-year period under review, ECE, Elektro energija and Energija plus had continuously been losing their market shares. On the other hand, only GEN-I had been gaining market shares every year over the same period.

Further strengthening of the market share of the already dominant supplier of electricity to households

FIGURE 124: COMPARISON OF THE MARKET SHARES OF SUPPLIERS TO HOUSEHOLD CONSUMERS IN THE 2018–2022 PERIOD



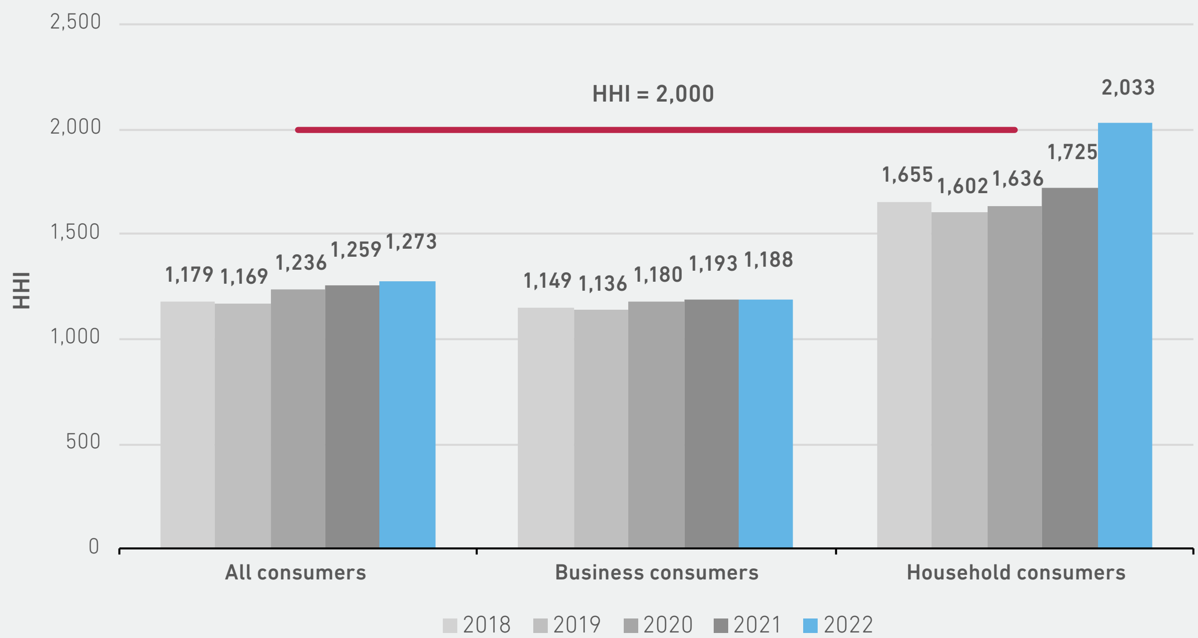
SOURCE: EPOS PORTAL

91 Changes in the market shares of suppliers in 2022 compared to 2021 are rounded to one decimal place.

Comparison of Concentrations in the Relevant Markets

In 2022, the HHI increased in the segment of supply to all final consumers, as shown in Figure 125, which was due to a considerable increase in concentration in the segment of supply to household consumers. In the segment of supply to business consumers, the HHI remained at a level comparable to those of the previous five years. The considerable increase in concentration in the segment of supply to household consumers indicates a reduction in competition in the relevant market due to exits from that market or the termination of supply by certain suppliers.

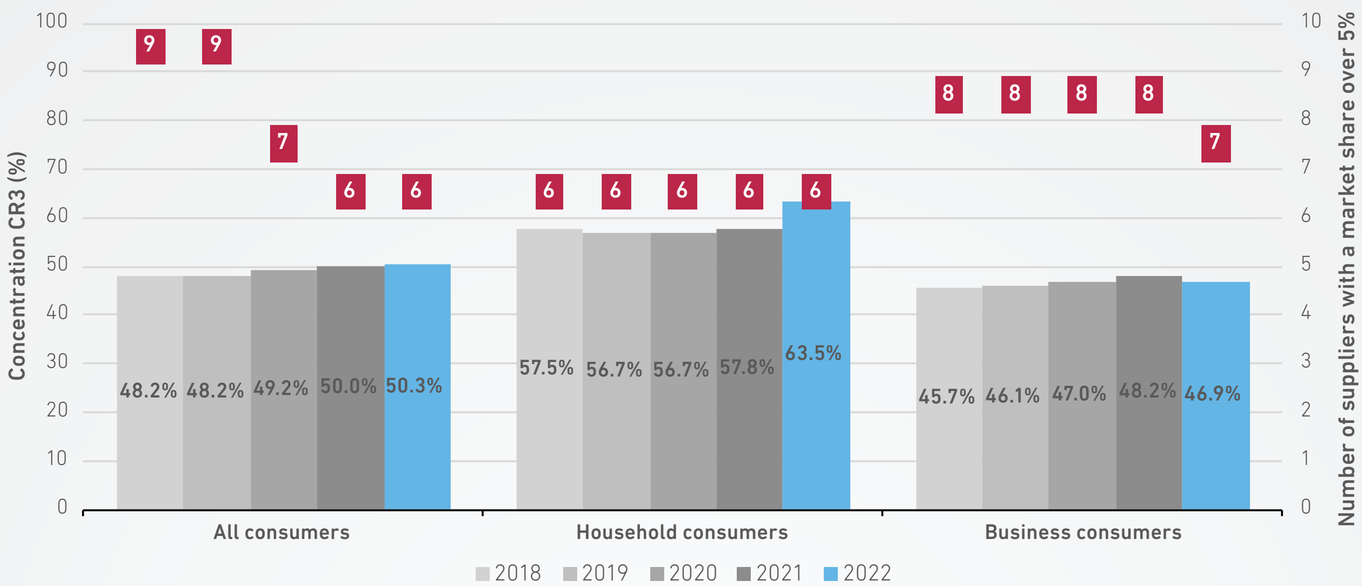
FIGURE 125: HHI EVOLUTION IN THE RETAIL MARKETS IN THE 2018– 2022 PERIOD



SOURCE: EPOS PORTAL

A concentration ratio (CR) is a standard indicator of market concentration according to the market shares. For the purposes of this report, CR3 is shown, which measures the total market share of the three largest suppliers in the market. Figure 126 shows the CR3 indicator and the number of suppliers with market shares bigger than 5%. Compared to 2021, CR3 increased in 2022 in the segments of supply to all consumers and household consumers. The latter, in particular, saw a considerable increase, with CR3 rising by 5.7 percentage points. In the segment of supply to business consumers CR3 decreased, while on the other hand, the number of suppliers with a market share above 5% also decreased in this segment.

FIGURE 126: CONCENTRATION (CR3) IN THE RETAIL MARKETS AND THE NUMBER OF SUPPLIERS WITH OVER 5% OF THE MARKET SHARE IN THE 2018–2022 PERIOD



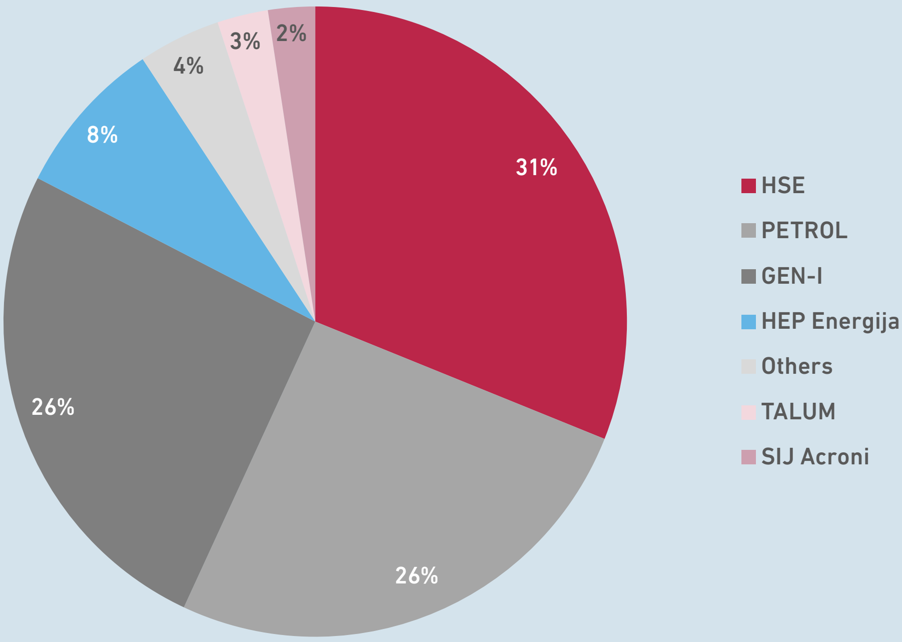
SOURCE: EPOS PORTAL

CASE STUDY
Market Shares in the Relevant Retail Electricity Markets by the Ownership Structure of Suppliers

At the end of 2022, there were 17 suppliers on the Slovenian retail market, 11 of which supplied electricity to household consumers. Suppliers have undergone changes in their ownership structure in the period since the liberalisation of the retail market. In view of these changes, it is therefore appropriate to monitor the market shares on the retail market with regard to the ownership structure of suppliers. In this case study, if a particular supplier is the majority owner of another supplier and thus owns at least 51% of the other supplier, the electricity supplied by the »owned« supplier will be attributed to the supplier that is the majority owner. In the retail market, we had several such cases at the end of the year. HSE had a majority holding in ECE and Energija plus, GEN-I had a majority holding in Elektro energija, while Petrol was the majority owner of E 3.

Figure 127 shows the market shares of suppliers according to their electricity supply in 2022, taking into account the supply in the entire retail market, which also includes large final consumers connected to the transmission system and closed distribution systems.

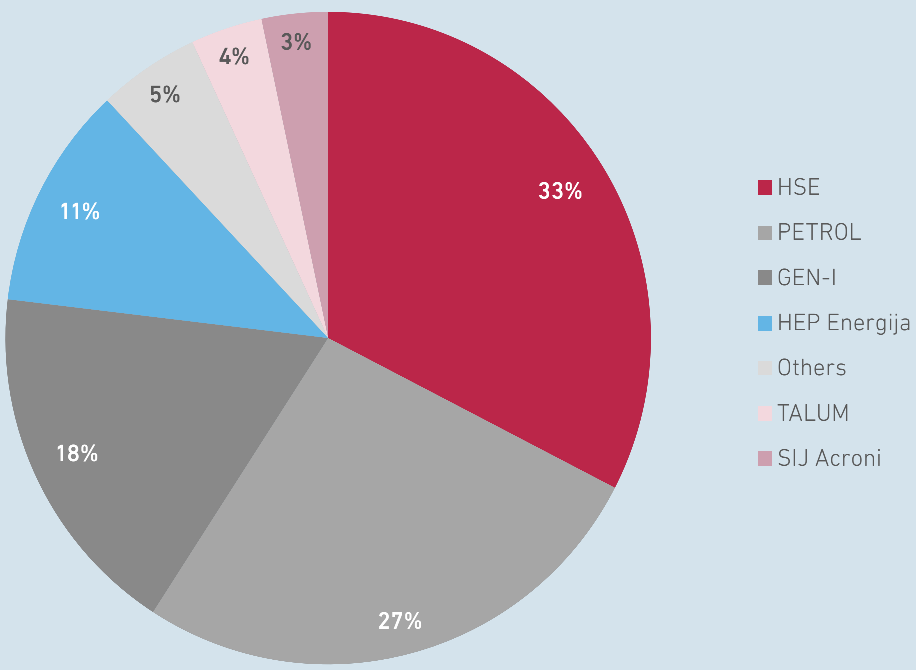
FIGURE 127: CHANGES IN THE MARKET SHARES OF SUPPLIERS TO ALL FINAL CONSUMERS IN 2022



SOURCE: EPOS PORTAL

Figure 128 shows the market shares of electricity suppliers in the retail market to business consumers in 2022.

FIGURE 128: MARKET SHARES OF SUPPLIERS TO BUSINESS CONSUMERS IN 2022[92]

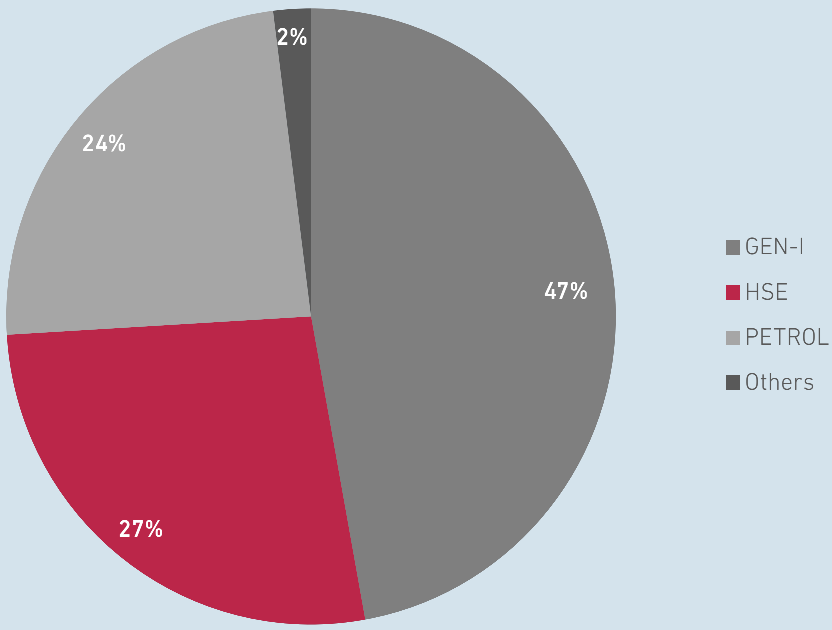


SOURCE: EPOS PORTAL

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

Figure 129 shows the market shares of electricity suppliers in the retail market to household consumers in 2022.

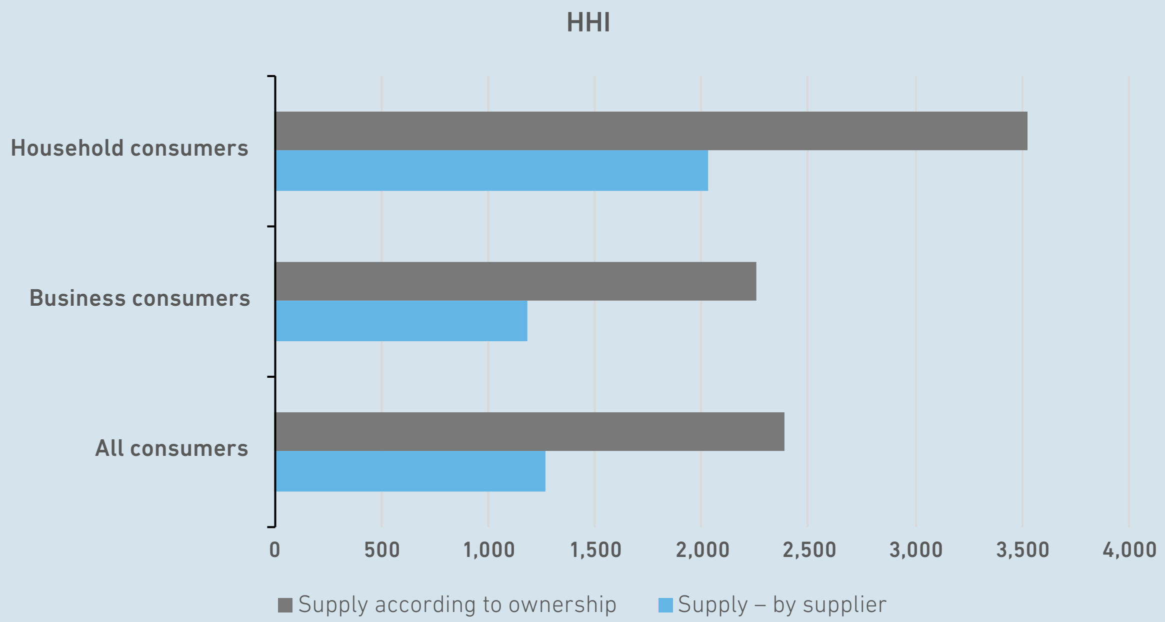
FIGURE 129: MARKET SHARES OF SUPPLIERS TO HOUSEHOLD CONSUMERS



SOURCE: EPOS PORTAL

Figure 130 reveals significant changes in the value of the HHI in 2022 if the ownership structures of suppliers in the retail market are taken into account. In this case, the HHI increases by 87% in the supply to all final consumers, by 90% in the supply to business consumers and by 73% in the supply to household customers. In all the retail markets, the HHI exceeds 2000, which means that these markets exhibit a high degree of concentration. The high concentration of the markets concerned has a direct impact on reduced competition. This is particularly evident in the supply of electricity to household consumers, where the HHI was 3525.

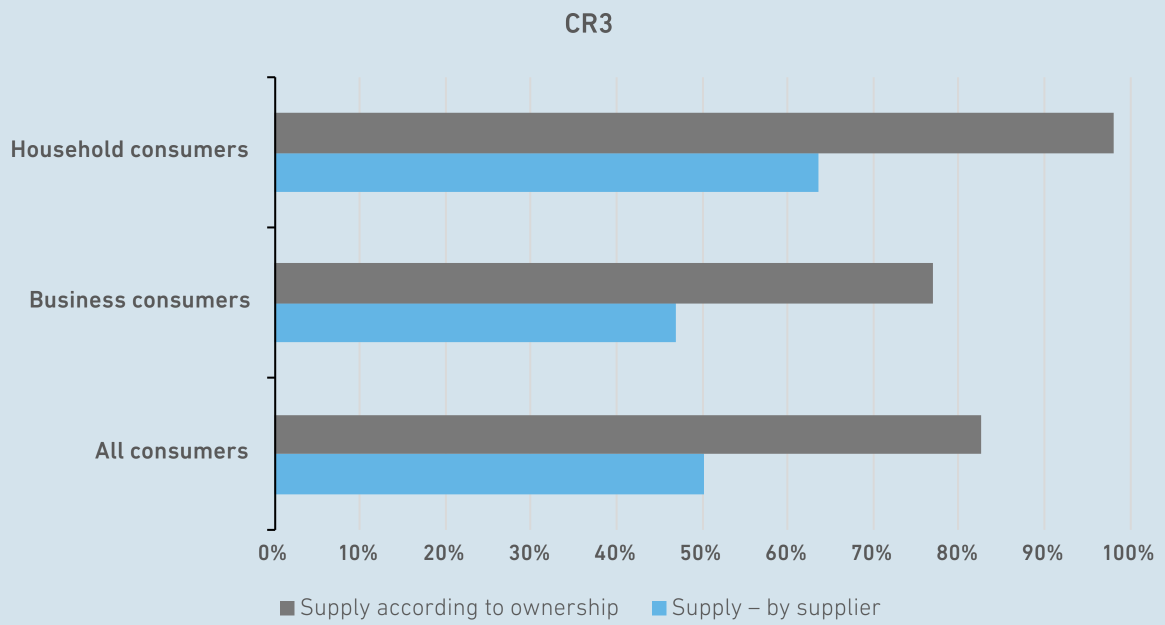
FIGURE 130: THE HHI IN THE RETAIL ELECTRICITY MARKET IN 2022



SOURCE: EPOS PORTAL

The CR3 market concentration indicator based on market shares, which shows the combined market share of the three largest suppliers in the market, taking into account the ownership structures of the suppliers, is shown in Figure 131. In the segment of supply to all customers, the CR3 is 32.3 percentage points higher if the ownership structures of the suppliers are taken into account than if they are not. Taking into account the ownership structure, the CR3 in the business and supply household segments increases by 29.9 and 34.5 percentage points respectively. In the household segment, the CR3, taking into account the ownership structures of the suppliers, amounts to 98%, which means that the remaining suppliers, which are not related to GEN-I, HSE or Petrol in terms of ownership, controlled a completely insignificant share of the retail market for household consumers in 2022 (only around 2%).

FIGURE 131: LEVEL OF CONCENTRATION (CR3) IN THE RETAIL MARKETS IN THE YEAR 2022



SOURCE: EPOS PORTAL

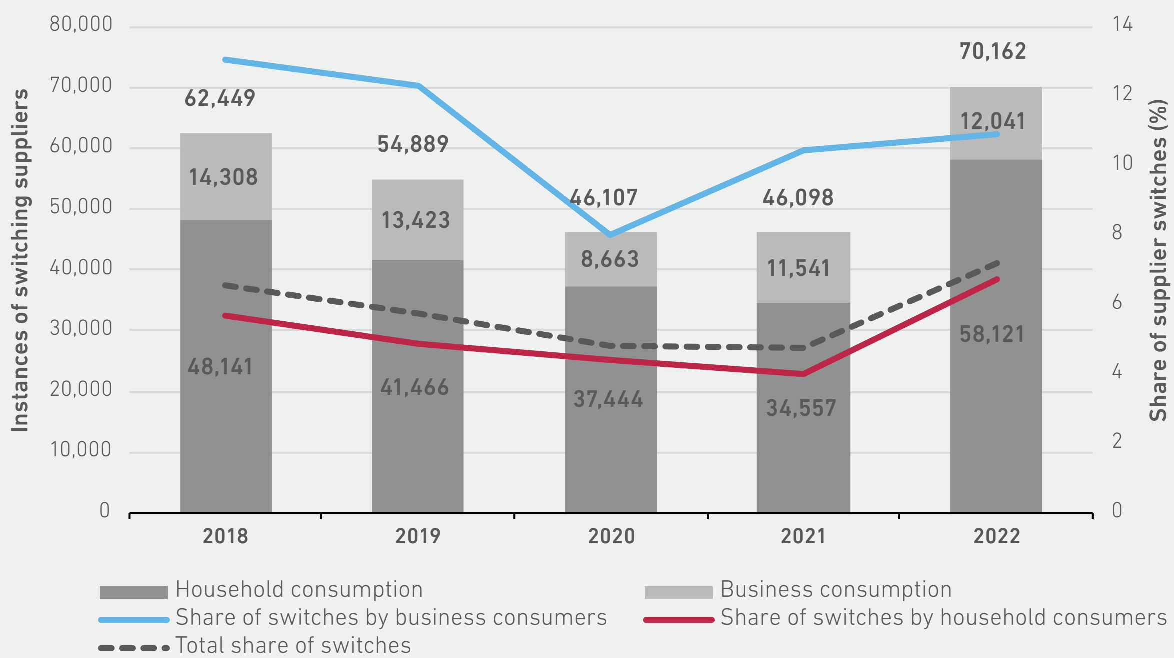
Switching Suppliers

In 2022, there were 70,162 electricity supplier switches, of which 58,121 were made by household consumers and 12,041 by business consumers, representing a 52% increase compared to the year before. On average, 4843 household consumers and 1003 business consumers switched their electricity supplier every month. In 2022, the five-year trend of a decrease in switches was broken.

67.2% more supplier switches by household consumers

The number of supplier switches in 2022 compared to the year before was higher from January to August. However, from September to December, the number of switches in 2022 fell below the levels of the same months of the previous year. The fall in the number of switches during this period is due to an increase in the last quarter of 2021 and the adoption of the Decree on the Determination of Electricity Prices, which capped the maximum retail price of electricity, thereby significantly reducing the price differentials between suppliers. Figure 132 shows the trends in the total number of switches according to consumption type and the share of switches made by household and business consumers in the 2018–2022 period.

FIGURE 132: TRENDS IN THE NUMBER OF SUPPLIER SWITCHES IN THE 2018–2022 PERIOD



SOURCES: ENERGY AGENCY, SODO

In 2022, the share of supplier switches made by household consumers was 6.7%, 2.7 percentage points more than the previous year. In terms of the level of activity in the market, the share of switches defines the market as active[93]. An increasing share of supplier switches has a positive impact on the level of market competitiveness since the consumers' activity affects the activities of the suppliers in the market. For comparison[94]: 17 EU countries had a higher share of supplier switches by household consumers in 2021 (based on metering points) than Slovenia. In three of those countries, the Neth-

93 Definitions by VaasaETT, »World Energy Retail Market Rankings«, 2012
94 ACER/CEER Annual Report on the Results of Monitoring the Internal Electricity and Natural Gas Markets in 2021 – Energy Retail and Consumer Protection Volume, October 2022, Figure 17.

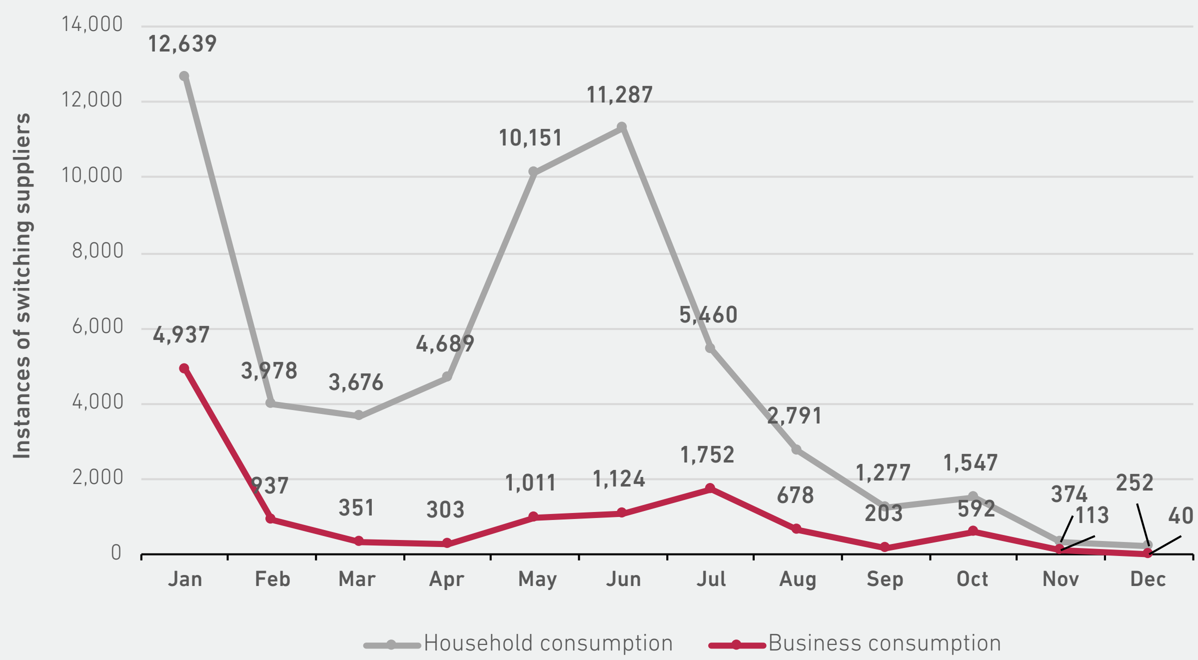
erlands, Belgium and Norway, the share of switches by household consumers was higher than 20%. A further 10 countries had a share of switches higher than 10%, which is significantly higher than Slovenia, which was 4%. In Slovenia, competition is getting weaker in the household segment, which is also influenced by ownership links between suppliers. The increase in the share of supplier switches by business consumers was significant.

51.4% more supplier switches compared to 2021

Figure 133 shows the number of switches in 2022 by month, with two periods standing out in terms of an increased number of switches, namely January and the period from April to July. In January, the increase was driven by the exit of one supplier (Telekom) from the retail market and the increase in retail electricity prices. The same factors also influenced the second peak in supplier switches in the April-July period. During this period, Adriaplin, Elektro prodaja E.U. and Energija direkt exited the retail electricity market, while E.ON announced its exit from the market as of 1 September 2022. The increased number of supplier switches in 2022 was also due to the increased awareness of consumers about the developments in the energy markets and their options in the face of price increases. The increased awareness has been strongly supported by frequent media coverage on the topic. From September onwards, the number of switches decreased significantly, as a result of the adoption of the Decree on the Determination of Electricity Prices, which set the maximum retail electricity prices, thus putting an end to the wave of supply price increases.

In 2022, there were 67.2%[95] more supplier switches by household consumers and 4.5% more supplier switches by business consumers compared to the year before. A higher number of switches by business consumers is usual at the beginning of the year, when most of one-year supply contracts expires. However, an increase in switches by business consumers was registered in the period from May to August as well, which was not typical in the previous years. That leap indicates that consumers are sensitive to the movement of retail electricity prices

FIGURE 133: THE DYNAMICS OF THE NUMBER OF SUPPLIER SWITCHES IN 2022 BY CONSUMPTION TYPE

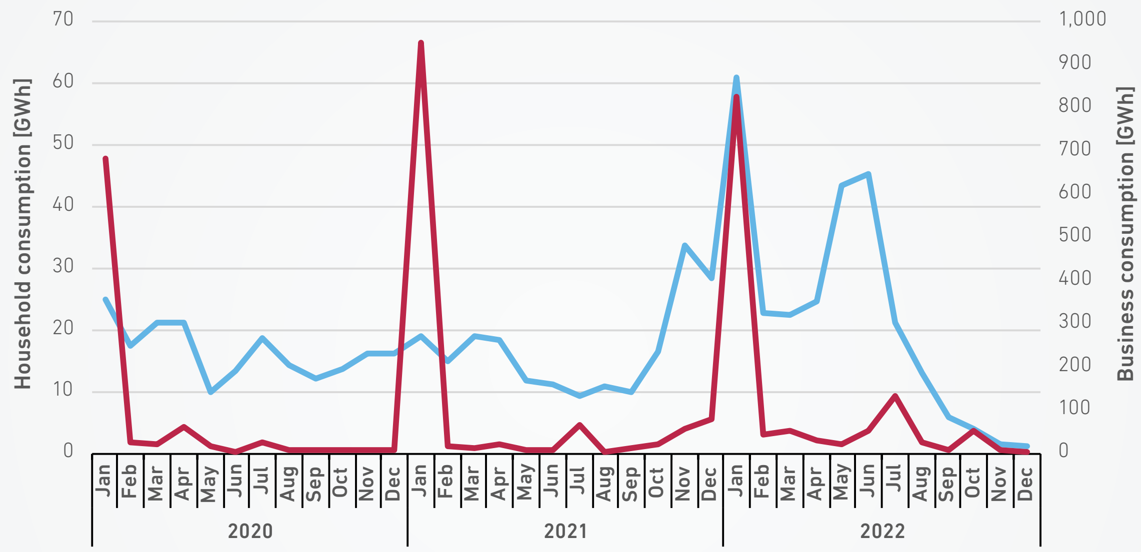


SOURCES: ENERGY AGENCY, SODO

95 Changes in the share of supplier switches in 2022 compared to 2021 are rounded to one decimal place.

Figure 134 shows the trends in the switched volume of electricity in the 2020–2022 period. The volume of switched electricity is closely related to the number of supplier switches. Switched electricity is the volume consumed by a consumer over one year that will cause an increase in electricity consumption with another (new) supplier due to the switch. That is why a higher number of supplier switches made by business and household consumers usually implies a higher volume of switched electricity. The leap in the volume of switched electricity in household consumption at the beginning of 2022 is clearly evident in the figure. In the case of household consumers, the volume of switched electricity in 2022 was 31.2% higher than the year before, while the share of the switched electricity volume was 7.7%. On the other hand, the volume of switched electricity in the case of business consumers in 2022 was only 0.6% higher than the year before and the share of the switched electricity volume was 13.2%, which represents an increase of 0.4 percentage points compared to 2021. This indirectly indicates that larger business consumers were able to negotiate more favourable electricity supply conditions with their existing suppliers to a greater extent.

FIGURE 134: VOLUMES OF SWITCHED ELECTRICITY BY CONSUMPTION TYPE



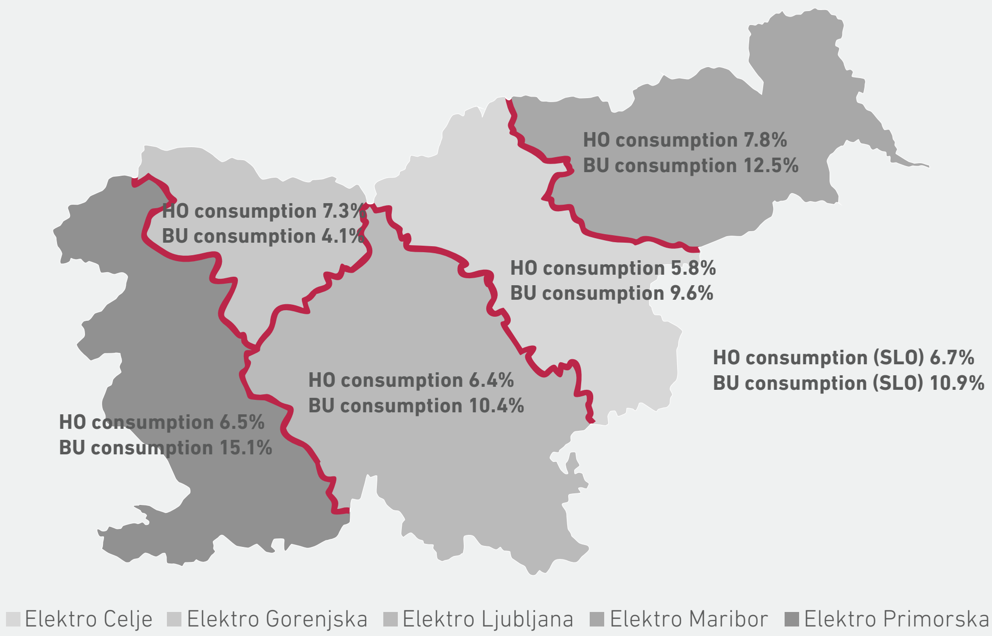
SOURCES: ENERGY AGENCY, SODO

Despite the potential savings (see the chapter Assessment of the Potential Benefits of Switching Suppliers), the number and share of supplier switches made by household consumers in Slovenia had been decreasing for five consecutive years until 2022.

Below is an analysis of supplier switches made by household and business consumers in individual geographic areas, the aim of which was to find out any deviations from the Slovenian average. The consumer's choice (supplier or product) does not depend on their location but the economic and demographic development of the areas is diverse. There are still suppliers on the market that historically originate from electricity distribution companies, i.e. the owners and contractual managers of networks in individual distribution areas. Some suppliers (Energija plus and ECE) still have ownership affiliation with those companies, which, in case of an ineffective division of activities, could be a potential obstacle to choosing suppliers freely.

Electricity suppliers supply electricity on the entire Slovenian territory, so all consumers are guaranteed the same freedom of choice. If the consumers' level of engagement were the same on the entire Slovenian territory, so just in theory, the number of supplier switches would be proportional to the total number of connected household consumers in the individual areas of the distribution system. Consequently, the shares of switches would be the same. Nevertheless, the actual data indicates various shares of supplier switches, as shown in Figure 135.

FIGURE 135: SHARE OF SUPPLIER SWITCHES MADE BY HOUSEHOLD AND BUSINESS CONSUMERS IN THE AREAS OF INDIVIDUAL DISTRIBUTION COMPANIES



SOURCES: ENERGY AGENCY, SODO

The analysis showed that the largest share of supplier switches by household consumers was recorded in the distribution area of Elektro Maribor, while the smallest share was seen in the distribution area of Elektro Celje. Compared to the overall share of switches made by household consumers in the Slovenian retail market, which was 6.7% in 2022, the share of switches was higher in the distribution areas of Elektro Gorenjska and Elektro Maribor, and lower in the other three areas (Elektro Primorska, Elektro Ljubljana and Elektro Celje). Compared to the year 2021, when the largest share of supplier switches by household consumers was recorded in the distribution areas of Elektro Gorenjska and Elektro Celje, while the smallest share was seen in the distribution areas of Elektro Ljubljana and Elektro Maribor, it is clear that it is impossible to detect a pattern indicating that consumers in certain distribution areas are more active in switching suppliers than in others, and we can also refute with high certainty an influence of the ineffective division of activities.

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

The retail market in Slovenia has experienced considerable changes over the last two years. The retail prices were changing at a significantly faster pace compared to previous years, which had an impact on the suppliers' business models. Competition in the market started to decrease due to the exit of suppliers. On the other hand, advances in digitisation made information more accessible and consumers more informed and many new services emerged in the market. All this contributed to a rise in consumer activity in 2022, until the implementation of the retail market interventions to mitigate the effects of the energy crisis.

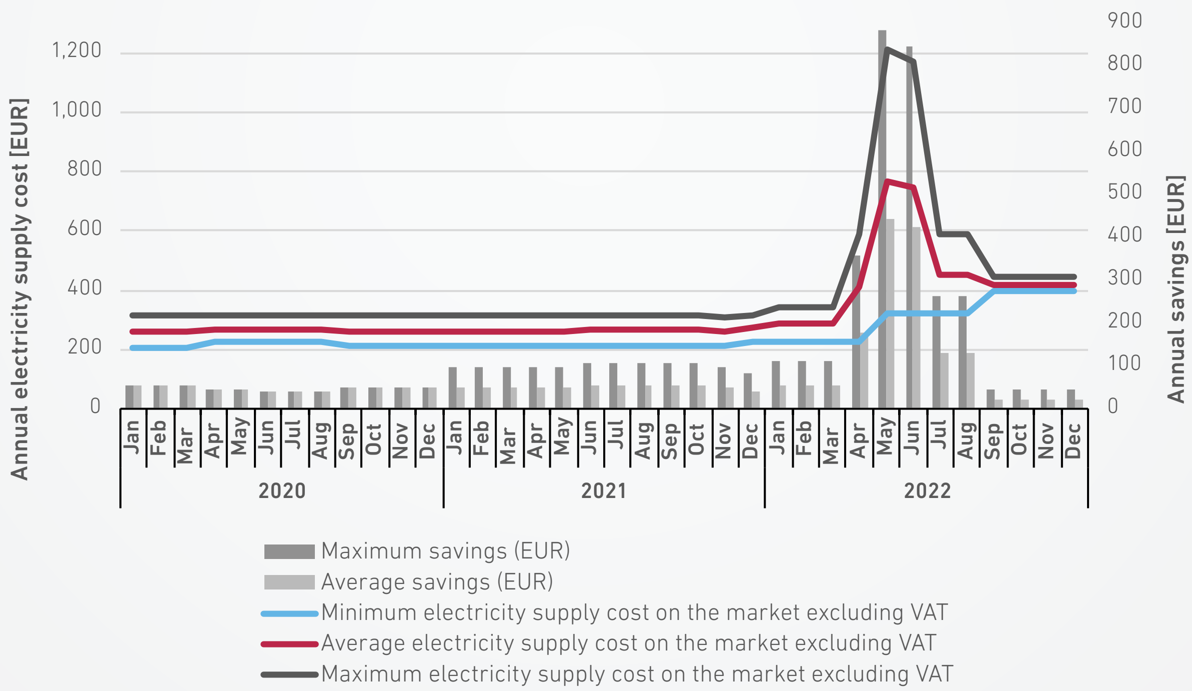
Assessment of the Potential Benefits of Switching Suppliers

By switching their supplier, every consumer can reduce their annual electricity supply costs, co-ordinate and improve the contractual relations with their supplier and therefore gain additional benefits.

Figure 136 shows the trends in the minimum, maximum and average costs of a typical Slovenian household consumer[96] 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.

The maximum (annual) costs consider the most expensive offer for electricity supply in the retail market[97]. The minimum (annual) costs take into account the cheapest offer published in the Supply Cost Comparator and that is 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 through which the supply to consumers was effected. 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.

FIGURE 136: POTENTIAL ANNUAL SAVINGS BY SWITCHING SUPPLIER BASED ON THE DIFFERENCE BETWEEN THE MOST EXPENSIVE AND THE CHEAPEST AND BETWEEN THE MOST EXPENSIVE AND THE AVERAGE SUPPLY OFFER IN THE MARKET



SOURCE: ENERGY AGENCY

96 Consumption type: capacity charges 8 kW, annual consumption 2100 kWh (MT) and 1996 kWh (VT)

97 According to the suppliers' information, the share of household consumers supplied under this offer was higher than 0.03%.

If a consumer whose 2022 supply was provided based on the most expensive offer opted for the cheapest offer in the market, their potential maximum or average saving in that one-year period would be between EUR 43.36 (21.68) and EUR 883.87(441.93) (provided that the prices remained the same for 12 months). Compared to 2020 and 2021, the range of potential savings for consumers with the most expensive supply varied significantly more. Figure 136 shows that the potential savings were stable from January to March, after which they increased until June, because the price of the most expensive offer had increased during that period. In July, the maximum and average potential savings finally decreased due to the decrease in the price of the most expensive offer on the market. In September, the Decree on the Determination of Electricity Prices came into force, setting the maximum allowed retail electricity prices, which resulted in a reduction in the maximum retail prices. This also led to a reduction in the difference between the most expensive and the most favourable offer in the retail market, resulting in lower potential maximum and average savings. By the end of the year, the potential maximum and average savings had fallen slightly further, as suppliers whose retail prices had been below the maximum permitted as laid down by the Decree raised their prices to the maximum permitted. At the end of the year, the difference between the most favourable and the most expensive offer on the retail market was only due to a small difference in price in one of the offers and to the lump sum costs charged by suppliers to each other for each offer.

The expected benefits of switching suppliers were significantly reduced by the intervention measures taken to mitigate the effects of the energy crisis

With some suppliers, the transmission of higher wholesale prices was somewhat more pronounced, which was reflected in new offers prepared by suppliers. The prices in the new offers were higher than in the previous ones. Very often, consumers did not accede to the new offers at all, or did so in a very limited number (after the conclusion of a promotional offer). The potential savings in 2022 were short-term due to the rapidly changing prices. It depended to a large extent on the timing of the supplier switch and could not be realised on an annual basis.

CASE STUDY

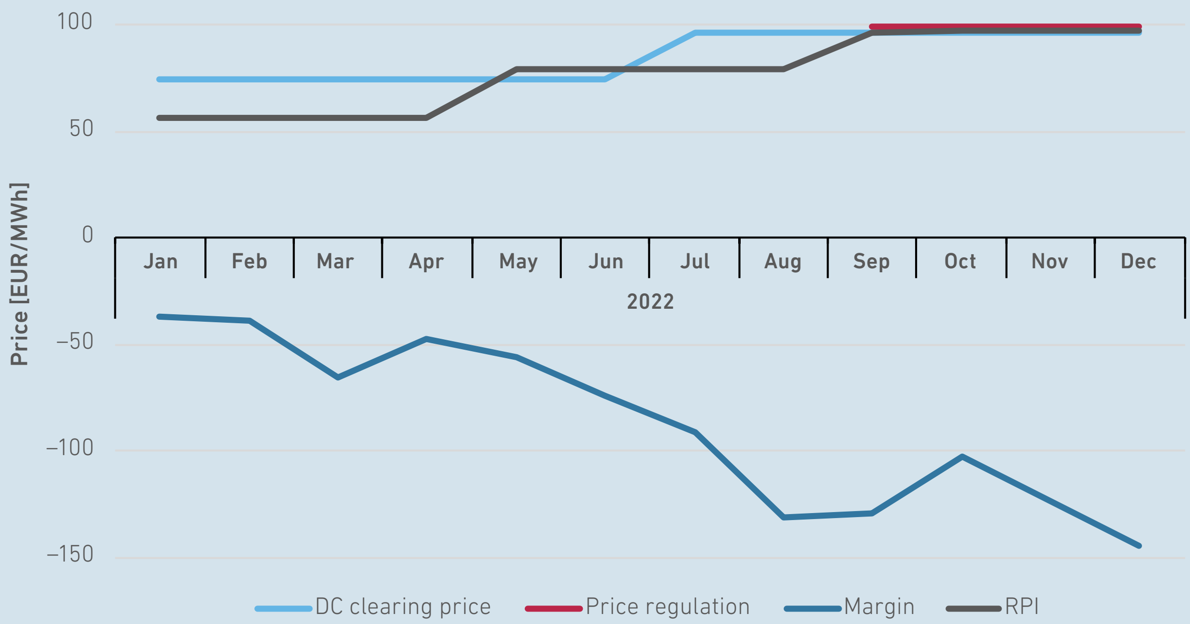
Impact of the Decree on Setting Gas Prices from the System on the Electricity and Natural Gas Retail Markets

The retail electricity and natural gas markets were subject to extensive and rapid changes in 2022. The number of suppliers changed significantly compared to previous years and changes were also reflected in the pass-through of the rising wholesale prices to the retail market. As of 1 September 2022, the Decree on the Determination of Electricity Prices and the Decree on Setting Gas Prices from the System became operational, with the aim of protecting final consumers from the rising retail prices. With these Decrees, the retail price for household and small business consumers was capped.

Figure 137 shows the RPI of electricity for an average household consumer[98], the price of electricity supplied to household customers in the standard consumer group DC[99] according to SURS, the capped price of electricity for an average household consumer and the indicative mark-up of electricity suppliers. Following the entry into force of the Decree on the Determination of Electricity Prices, the RPI[100] moved towards just below the retail price cap. A similar trend can be seen in the half-yearly prices of electricity delivered to household consumers from the standard consumer group DC is presented below.

98 Consumption profile of an average household consumer of electricity in Slovenia: billed capacity 8 kW, annual consumption 1996 kWh (peak tariff) and 2100 kWh (off-peak tariff).
99 The standard consumer group DC includes household consumers of electricity with an annual consumption of between 2500 and 5000 kWh.
100 RPI is based on the lowest offer in the retail market that is accessible to all household consumers and does not include a contractual penalty.

FIGURE 137: RETAIL PRICE INDEX, FINAL ELECTRICITY PRICE, REGULATED PRICE AND SUPPLIERS' MARK-UP IN 2022



SOURCES: ENERGY AGENCY, SURS

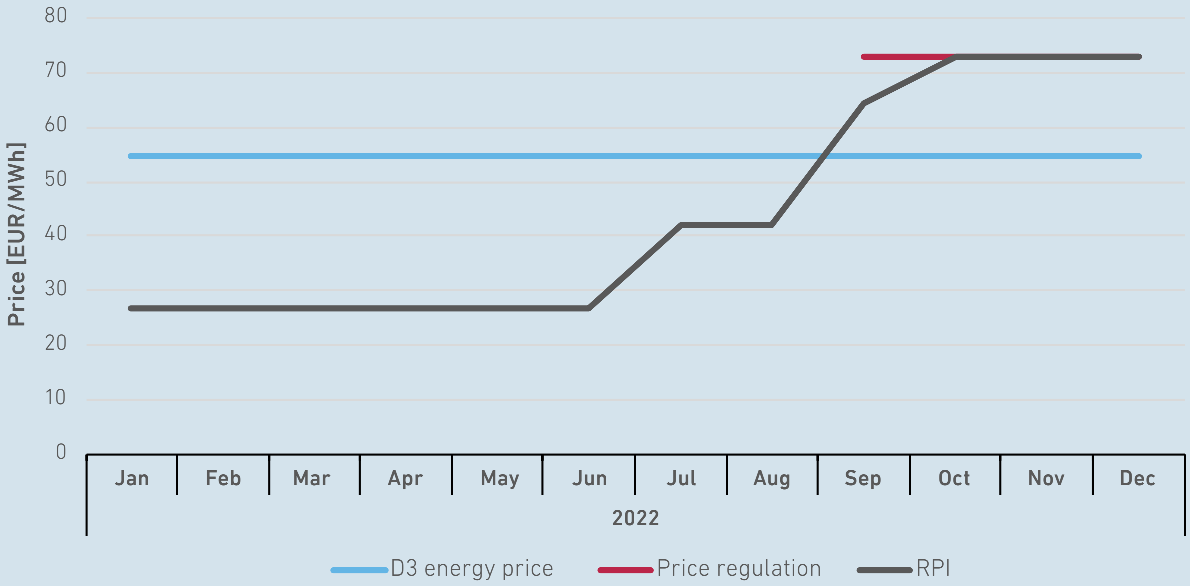
Wholesale and retail price movements have a direct impact on suppliers' indicative mark-up[101]. A negative indicative mark-up of electricity suppliers was present throughout 2022 with an increasing trend until the end of August. The increase in the negative indicative mark-up was mainly due to rising wholesale prices. In the months following August, the wholesale prices finally fell to lower levels, but the mark-up did not change significantly. That was a consequence of the Decree on the Determination of Electricity Prices, which set a maximum retail price. A price cap on the highest permitted retail price stopped the growth of retail prices, which prevented the transfer of relatively high wholesale prices to the retail market. The high level of the indicative negative mark-up also reveals the high probability that the pass-through of wholesale prices would have continued to the retail market if the Decree on the Determination of Electricity Prices had not imposed a maximum retail price, which prevented suppliers from reducing losses by leveraging the increase in retail prices.

The Decree on the Determination of Electricity Prices also had an influence on supplier switching. The number of electricity supplier switches by household consumers in 2022 compared to the year before was higher from January to August. The decrease in the number of switches observed from September to December 2022 is certainly also due to the price cap, which has significantly reduced the benefits of switching[102]. Thus, in November 0.7% of the total switches in 2022 took place, while there were only 0.4% in December.

Figure 138 shows the RPI of natural gas, the average price of natural gas supply to household consumers in the standard consumer group D3[103] according to SURS data and the capped price. The RPI trends show an increase in the price of the most favourable offer available to all consumers in the retail market. With the entry into force of the Decree on Setting Gas Prices from the System, the RPI approached the limit of the maximum retail price allowed, and finally reached it in December.

101 The indicative mark-up of electricity suppliers is defined in more detail in the section Margin and Responsiveness of Retail Prices.
102 Potential savings are discussed in more detail in the chapter Assessment of the Potential Benefits of Switching Suppliers.
103 The standard consumer group D3 includes household consumers with an annual consumption of above 55555.6 kWh.

FIGURE 138: RETAIL PRICE INDEX, FINAL ELECTRICITY PRICE AND REGULATED PRICE IN 2022



SOURCES: ENERGY AGENCY, SURS

Compared to the year before, the number of natural gas supplier switches by household consumers in 2022 was higher throughout the year. Contrary to the expectations that the adopted Decree on Setting Gas Prices from the System would have a decreasing effect on the number of supplier switches in the period following the date of its application, a significant increase in the number of switches has been observed in that period. This increase in the number of switches can be explained by structural changes in the retail market for natural gas, caused by exits of certain suppliers: E.ON (1 September 2022), Komunalno podjetje Velenje (1 October 2022) and Domplan (1 November 2022). The supplier Energetika Celje also announced their intention to stop supplying natural gas, at the same time inviting their consumers to switch supplier. In the end, Energetika Celje did not stop supplying natural gas. The exits of suppliers from the retail market led to an increase in switches in the last quarter, in both absolute and relative terms. For example, in November 2022, almost 32% of all annual switches by household consumers took place. During that period, switching was also no longer driven by potential savings, as there were none in December[104].

According to the suppliers' representatives, the exits of some natural gas suppliers from the retail market, or their intentions to exit, were to a certain extent a consequence of the adoption of the Decree on Setting Gas Prices from the System, as at the time of its adoption, there were uncertainties as to the manner and timing of the reimbursement of the difference between the higher wholesale prices and the capped retail prices to the suppliers[105]. Similarly to electricity suppliers, natural gas suppliers faced a negative mark-up during this period, which they could not reduce by raising retail prices due to the cap on the maximum retail price. According to the calculation of the indicative mark-up of natural gas suppliers[106], the mark-up was negative in 10 months in 2022. On 9 December 2022, the Act Regulating Emergency Intervention to Address High Energy Prices was adopted, which, among other things, regulates or sets measures to control the prices of energy and energy products, contributions and the use of surplus revenues. It stipulates that appropriate financial compensation or another measure having the effect of adequate compensation for the damage is determined for suppliers who suffer significant damage as a result of a price control measure. The use of surplus market revenues from electricity generators is foreseen as one option to compensate suppliers who are obliged to supply electricity and gas to consumers at a regulated price that does not cover the cost of procuring this energy. The eligibility evaluation and the payment of compensation to suppliers were carried out by the electricity market operator, Borzen, at the beginning of 2023. The necessary funds were provided by the Ministry of Finance.

104 Potential savings are discussed in more detail in chapter Assessment of the Potential Benefits of Switching Suppliers.
105 https://siol.net/posel-danes/novice/padec-prve-domine-3-000-kranjcanov-brez-plina-zaradi-vladnih-ukrepov-587834
106 For the formation of energy purchase costs in the indicative calculation of the natural gas suppliers' mark-up, the annual forward contracts for 2022 on the Dutch TTF were taken into account to the extent of 75% (considering the trading period from 1 January 2021 to 31 December 2021) and the average settlement prices of the spot trading on the Austrian CEGH TTF were taken into account to the extent of 25% (considering the trading period from 1 January 2022 to 31 December 2022). The analysis did not take into account the additional cost of transmission capacity and other costs incurred by suppliers in connection with the purchase and supply of natural gas.

Measures for Promoting Competition

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

Under 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 regulations, it is set by the Energy Agency.

But in the autumn of 2022, the Government of the Republic of Slovenia capped retail electricity prices as part of the intervention measures to mitigate the energy crisis (see the case study how we tackled the energy crisis for more details).

Effective Data Exchange in Key Market Processes

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

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

EU countries are expected to enable the full interoperability of energy services across the EU to stimulate competition and avoid excessive administrative costs. The Commission's strategy is to ensure harmonisation based on the introduction of a process reference model[107], which can, to a considerable extent accommodate national practices and particularities. A proposal for an implementing act on interoperability requirements for data access and exchange was submitted for discussion[108]. Following a public consultation, which closed in January 2022, and a public hearing of proposals that closed in September 2022, the act proposal was submitted to the comitology procedure to be adopted in the second quarter of 2023. In their proposal of the definition of the work scope, the SGTF EG1 (Smart Grid Task Force Expert Group 1) proposed flexibility - the flexibility register domain as the next area of work.

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

108 https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13200-Access-to-electricity-metering-and-consumption-data-requirements_en

On the other hand, the field of flexibility has been developing very intensely on the basis of the new regulatory framework: there are many ongoing research projects and studies and the first implementations have also been taking place. Through the EG on the DSF expert group, ACER carried out the defining of the general flexibility framework at the EU level (vocabulary, principles, requirements for processes and processes of exchanging experience, best practices and areas where further harmonisation is necessary)[109]. They took into account the interaction of existing codes, guidelines and implementing acts[110]. Although the EC had originally planned to start implementing a network code for resilience[111] based on the ACER general framework (»Framework Guideline on Demand Response«[112]), in 2022, it was only published at the end of December 2022 due to the market situation and the energy crisis.

The implementation of data exchange between the participants in the Slovene electricity market is predominantly carried out in compliance with the relevant reference models (e.g. the ENTSO-E/ebIX/EFET harmonised model of roles in the electricity market, etc.). In 2022, the processes of the updated market model were intensely adapted to the concept of split supply[113], which is based on the introduction of a metering point[114], and eliminated incompatibilities with the reference model at the national level and provide the optimum possibilities for the development of energy services and for strengthening the competition in the retail market.

The National Data Hub online data portal mojelektro.si is designed to ensure the compatibility of centralised data access with the draft implementing act on access to the data on consumption (B2C segment). The areas with the most incompatibilities are as follows: ensuring interoperability at the level of local access to data (I1 interface on the smart meter); implementation in the field of flexibility where planned deviations from the reference models can be identified, starting with unsuitable definitions of roles and responsibilities. As this is a developing area, the Energy Agency assumes that those incompatibilities are of a transitional nature.

The Act on the Identification of Entities in the Data Exchange Among Participants in the Electricity and Natural Gas Markets requires market participants to use standardised identifiers of key data entities in the electronic exchange of data in the market. In accordance with the Energy Agency's general act, all the key data entities in an electronic data exchange have to be determined with standardised identifiers.

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

In 2022, the following key issues were considered in the framework of the IPET Section:

- introduction of a metering point;
- technical aspects of the relocation of metering points of small business consumers with an installed capacity equal to or less than 43 kW to the metered diagram, with a focus on the timely communication of the relocation of metering points and the pressing dilemma of the new diagram of the remaining consumption that will be created after the relocation of these metering points;
- new rules on the functioning of the EE market, introducing a new imbalance settlement method with a single imbalance price from 1 January 2023;
- a new model of calculating the network charge that will become operational in 2024;
- improvements to the single entry point of the National Data Hub;
- consideration of self-supply in the imbalance settlement.

Within the ebIX, the focus was on modelling processes in the area of flexibility by developing and publishing data exchange models at the level of the Business Requirement Specification (BRS) for distributed flexibility and on the active contribution to the emerging EU Interoperability Assurance Framework through participation in the EU SGTF EG1. The ebIX published a new version of the Harmonised Gas Role Model and a status report on the alignment of the two harmonised role models, i.e. for the electricity and natural gas markets[115].

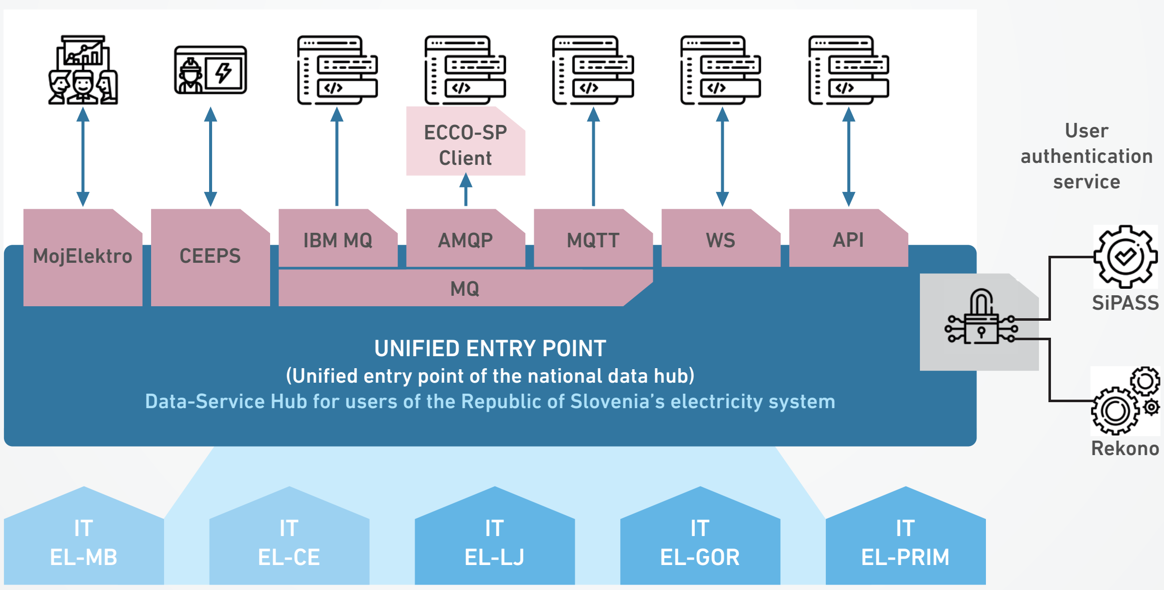
109 In 2021, the EG on DSF, established by ACER, defined the scope of flexibility.
110 The areas of metering, validation, settlement, baseline methodology and aggregation are mutually interconnected by the implementing acts on interoperability.
111 Tackling rising energy prices: a toolbox for action and support: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2021%3A660%3AFIN&qid=1634215984101
112 https://acer.europa.eu/Official_documents/Acts_of_the_Agency/Framework_Guidelines/Framework%20Guidelines/FG_DemandResponse.pdf
113 See the USEF report.
114 Implementation of the Metering Point domain in compliance with the reference model.
115 https://www.ebix.org/artikel/home

Providing Consumers with Standardised Data Services

The Government Decree on Measures and Procedures for the Introduction and Interoperability of Advanced Electric Power Metering Systems (hereinafter the Decree) and the Plan for the Introduction of an Advanced Metering System in the Slovenian Electricity Distribution System (hereinafter the Plan) define, among other things, the advanced metering system architecture, roles and responsibilities, its minimum functionalities, and some aspects of the implementation of data exchange based on relevant standards (CIM, etc.). The Decree requires the DSO to establish a single access point for accessing data in the advanced metering system. Based on the Plan mentioned above, the system is implemented as a central system for accessing metering data (national data warehouse), which is managed by the DSO and provides data exchange services among business entities and network users in the B2B and B2C domains, with a plan to further extend the area of exchange to the B2G segment.

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

FIGURE 139: HIGH-LEVEL ARCHITECTURE OF THE EVT NATIONAL DATA HUB



SOURCES: EDCs

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

- **The MojElektro Portal** – online user portal intended for all end-users and their authorised representatives who can access all the metering points and metering and accounting data that they are entitled to, regardless of their supplier or distribution area. It enables an overview and export of all the available 15-minute data by metering points (received and delivered active/reactive power, possibility of aggregation by hour, day, month, etc.), monitoring the consumption and production above the self-supply metering points, the submission of a new tax ID number on a metering point, the submission and entry of the meter reading at a metering point;
- **CEEPS Portal** – for users eligible to access data, it fully replaces the PERUN[116] in terms of functionality. All the electricity suppliers, Borzen, the Centre for RES/CHP support, the closed distribution systems and the distribution system operator are registered on the portal. It enables centralised imbalance settlement, access to and export of 15-minute data based on balance sheet eligibility, the submission and entry of meter readings on behalf of end-users, carrying out the supplier switching process in line with the SONDSEE requirements, access to accounting data (the so-called Annex A), management of all the changes on the metering points, etc.
- **Massive data exchange - B2B Type - MQ services:** continuous daily massive data exchange for individual eligible users, the daily transmission of the available 15-minute metering data for the previous day, the addition of new measuring points to the daily transmission and specific request for the available 15-minute metering data.
- **WS/REST-API** are 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 introduction of the restAPI services is foreseen in 2023 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.

Introduction of the metering point concept at the level of the evolving national data warehouse

In 2022, development activities in this area[117], which all distributors in Slovenia were involved with, included:

- As part of the introduction of the metering point, the MojElektro and CEEPS portals and the data services for suppliers were upgraded. The key changes:
  - The MojElektro.si Portal:
    - Enabled overview of data on the metering point or metering points at a single metering point;
    - Enabled overview of technical data on the metering point (meter, status of metrological control, verification of metrological accuracy via the Metrology Institute, etc.);
    - Enabled overview of the so-called hierarchy of the connection of the metering point, so that the end-user can access the information on the metering point's affiliation to the parent asset;
    - Enabled overview of the data from the metering post register and the metering points register.
  - The CEEPS.si Portal:
    - Transfer of functionality for suppliers and SODO from the PERUN portal to the CEEPS portal;
    - Enabled submission of all service requests via a metering point or metering post (depending on the request);
    - Ordering and organising the priority of the metering data for D-1 transmission to the MQ of a specific supplier;
  - B2B Services:
    - Upgrade of data services for the D-1 and M-1 transmission of metering data through the associated metering point;
    - Transmission of metering data according to the priorities set by the supplier;
    - Upgrade of the message structure in line with SONDSEE.

116 All PERUN portal functionalities have been terminated and transferred to CEEPS as of 1 March 2021.
117 Metering data single access system (SEDMP) with B2B data services for suppliers and other eligible users.

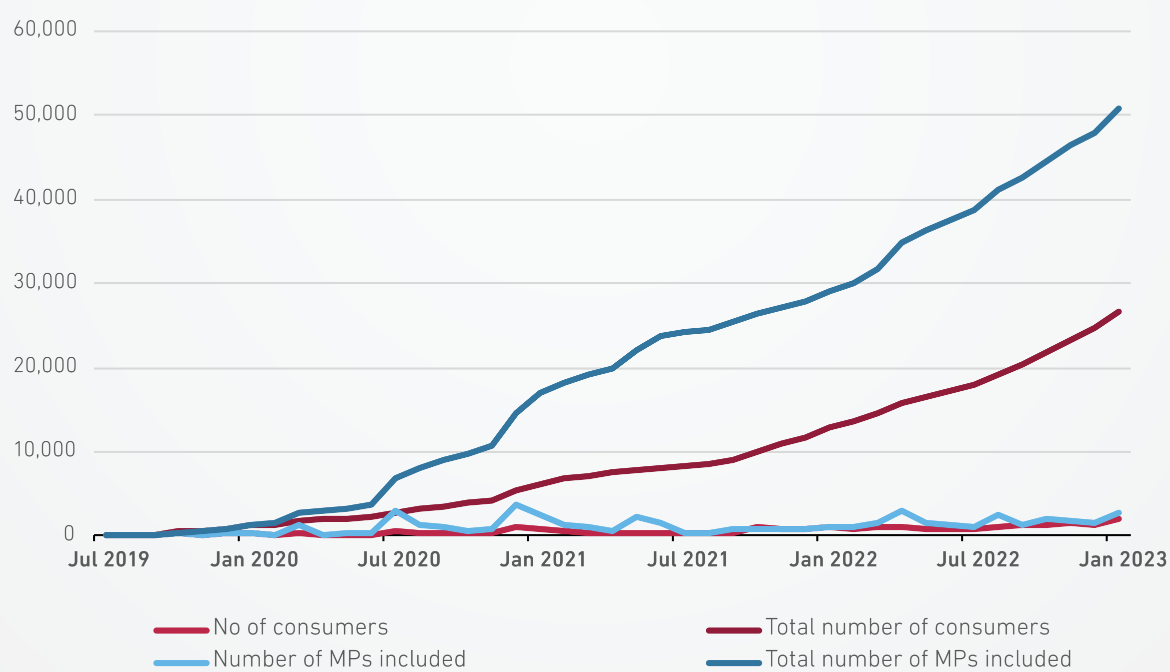
- At the end of 2022, the Flexibility testing service was launched on the MojElektro and CEEPS portals for the purpose of collecting the initiatives of active consumers in the distribution system regarding flexibility and for registration in the flexibility distribution system register. In the framework of the Green Transformation Consortium, a pilot mechanism to exchange data on flexibility services between the back-end management systems and the EVT has already been carried out in cooperation with Elektro Ljubljana.

Launching a testing service for collecting initiatives regarding flexibility on the consumption side for the purpose of the distribution system

On 31 December 2022, more than 50,000 metering points registered in the mojelektro.si online portal

Thus, the number of users of the Moj Elektro portal has constantly been growing. At the end of 2022, 50,000 metering points were registered in the Moj Elektro portal, which is 150% more than the year before. The monthly increment of newly registered users is more than 1200.

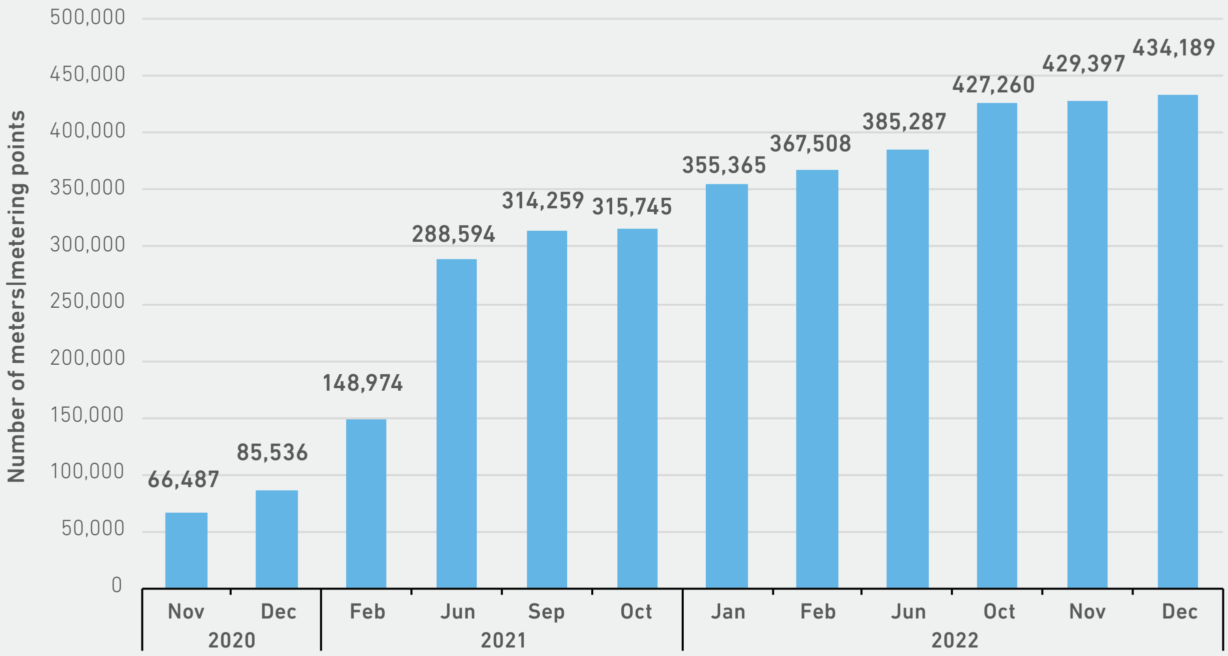
FIGURE 140: DEVELOPMENT OF THE NUMBER OF REGISTERED USERS AND THE NUMBER OF REGISTERED METERING POINTS IN THE MOJELEKTRO.SI PORTAL



SOURCES: EDCs

At the end of 2022, electricity suppliers were receiving 15-minute metering data for more than 430,000 metering points daily through the EVT (B2B) services.

FIGURE 141: TRANSMISSION OF 15-MINUTE METERING DATA TO SUPPLIERS FOR D-1 AND M-1 (DATA FOR MP > 43kW AUTOMATICALLY CAPTURED AND DATA FOR MM <= 43kW FROM THE ORDERED LIST)

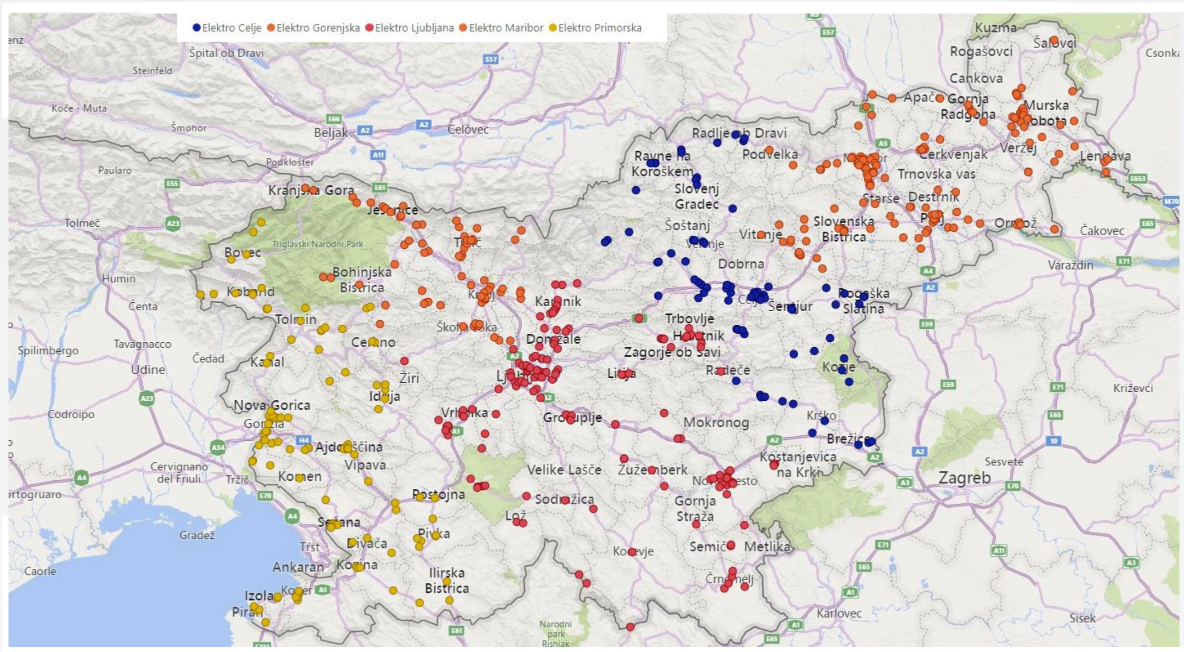


SOURCES: EDCs

Through the SEP, EDCs also harmonised the way in which data is transmitted in near real-time and established an efficient exchange of data between key production metering points in the distribution area and the transmission system operator. This approach ensures that the architecture of the interfaces for accessing the ECCoSP platform is unified and the interfaces are moved to the EVT within which the measuring data is submitted to the transmission system operator in almost real-time through the ECCoSP of a consumer. In 2021, a presentation of the ECCoSP of an Elektro Ljubljana consumer was already carried out. In 2021, a presentation of the ECCoSP of an Elektro Ljubljana consumer was carried out. In the first quarter of 2022, there was a presentation of the ECCoSPs of other consumers in the shared address space, which provided unified access to the transmission system operator's platform at the level of the SEP.

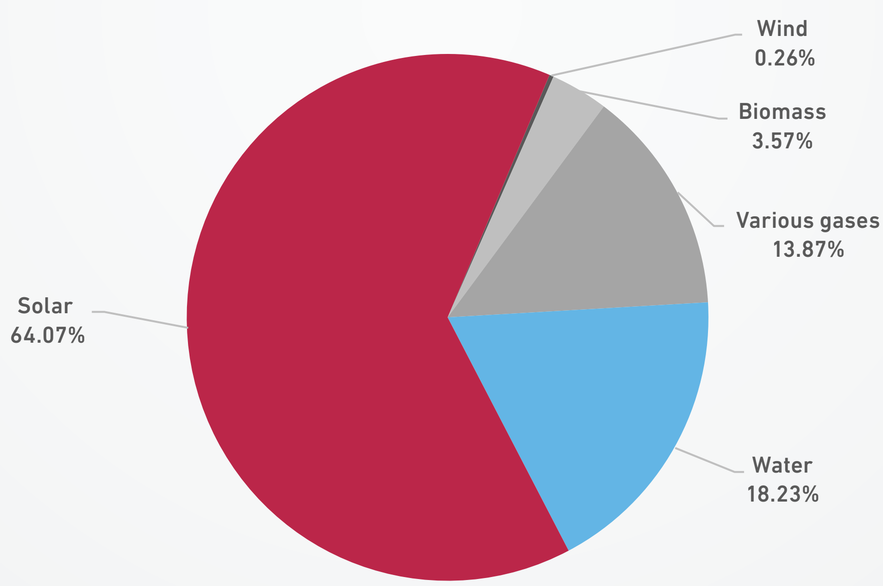
In 2022, the appropriate equipping of the metering points of energy sources with an installed capacity of over 100 kW continued so as to enable data transmission to the transmission system operator in near real-time, in line with the requirements of the tripartite contract between the two electricity system operators and the distribution companies. In total, more than 758 metering points were equipped, which transmit real-time 15-minute data directly to the TSO in near real-time.

FIGURE 142: DATA ACQUISITION LOCATIONS AT THE MP PRODUCTION LEVEL > 100 kW OF INSTALLED CAPACITY IN NEAR REAL-TIME



SOURCES: EDCs

FIGURE 143: SHARES OF RES TYPES IN NEAR REAL-TIME EXCHANGE



SOURCES: EDCs

Unfortunately, a formal definition of the range of standardised data services provided by the DSO to system users either free of charge or for a fee remains undetermined. The issue of providing effective local access to metering data in real-time (in the I1 interface of a smart meter) to all users equipped with smart meters is still not resolved in a satisfactory manner, especially due to the technical restrictions of built-in smart meters and the inadequate standardisation of the interface. Partial resolution in this area is expected in 2023 with the entry into force of the new SONDSEE.

CASE STUDY
Scope and Quality of Data Provided in the Framework of the AMS

Based on the Decree on Measures and Procedures for the Introduction and Interoperability of Advanced Electric Power Metering Systems and the related task of regulatory control, the Energy Agency monitors the extent and quality of the provision of metering data within the Advanced Metering System (AMS).

As part of managing the risks associated with the implementation of the reform of the network charge methodology, the Energy Agency has defined a set of indicators to monitor the availability and quality of data, comprising more than 20 different key performance indicators (KPIs), as the KPIs reported in the framework of SODO's annual status reports on the implementation of AMS were not satisfactory. Through these KPIs, the Agency monitors the progress of the introduction of the AMS at the level of the shares of advanced meters installed and integrated in the AMS, the availability of 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 and non-validated) at the levels of the delivery point, metering post, metering point and consumer, the share of metering devices by communication technologies, etc.

The new network charge methodology is based on the use of 15-minute accounting data on consumption or achieved capacity. It is therefore essential that the largest possible share of consumers is provided with adequate metering to enable billing based on the Energy Agency's new methodology in 2024 and to ensure that users enjoy the full benefits of this methodology, which is CEP-compliant and designed to support the green transition.

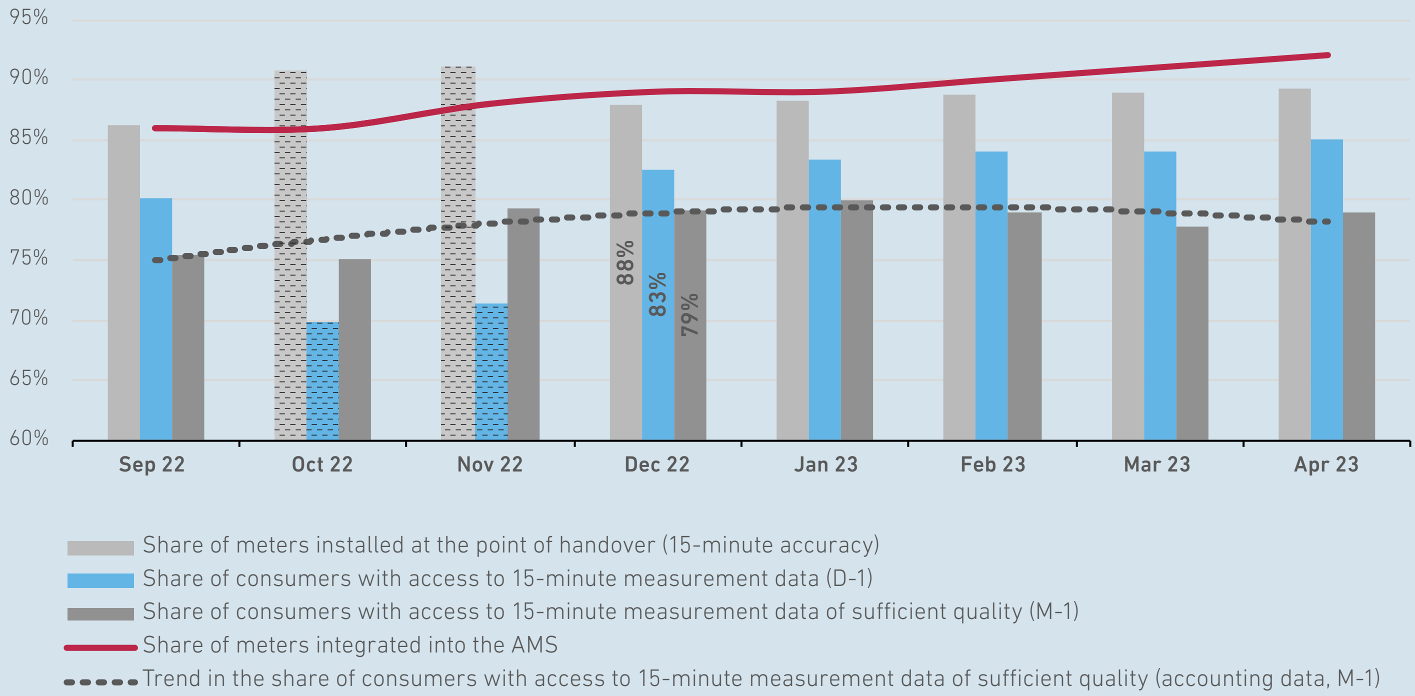
Despite the achieved targets for advanced meter installations, which comply with the EU normative requirements (80% by 2020) and deviate only slightly from the roadmap set out in the Plan for the introduction of an advanced metering system[118] (an indicator of the percentage of meters installed), the Energy Agency found significant deviations when establishing the volume and quality of the metering data at the level of the metering centres and the national data hub. Thus, while the Agency definitely recognises a trend of progress in the availability of advanced metering devices at consumers during the period under review, the progress in data quality was not as significant (Figure 144).

Selected key performance indicators related to this issue:

#	KPI
1	**The share of installed meters at the point of handover (15-minute resolution):** the share of metering equipment capable of providing the data necessary for the billing of network charge and other services
2	**The share of users with guaranteed access to minute measurement data (D-1):** user access to non-validated 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-handover level 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)

118 https://www.sodo.si/objave/nacrt-uvedbe-naprednega-merilnega-sistema-v-elektrodistribuc

FIGURE 144: SELECT KEY INDICATORS TRENDS IN THE AMS[119]



SOURCES: SODO, ENERGY AGENCY

The deviations result from deficient data processing in the measurement centres with an inadequate data »clean-up« process. This is necessary due to the technical restrictions of the PLC communication technology[120] (susceptibility to interference), as well as an inappropriate interpretation of EU legislation with respect to the use of detailed metering data within an AMS, on which basis the data services associated with this data were addressed and provided in an inappropriate manner in terms of priority. The »data clean-up process« has not yet been harmonised at the distribution level, either in scope or in substance, nor within the individual electricity distribution companies, and as a result, the data quality levels achieved vary substantially at the distribution level both between individual zones and within them. Although in most zones, the quality does reach the values set out in the metering equipment purchasing specifications (or the deviations are insignificant), there are zones where the quality is considerably lower, which at the national level, results in a roughly 10% deviation from the expected level of quality when measured as a proportion of consumers. There is also a worrying trend indicating the stagnation or degradation of quality, in relation to the volume of consumers, in 2023.

On the basis of the analysis, the Energy Agency concludes that, despite the limitations of the state of the art (the susceptibility of the communication channels in the network infrastructure to electromagnetic interference), there is potential in the area of data clean-up, which can help improve the percentage of good quality measurements available for both M-1 and D-1.

Due to the new network charge billing methodology, which is based on 15-minute billing data, it is vitally important to adopt measures necessary to ensure the required availability of quality data for all suitably technically equipped consumers before the planned date of network charge rate notification, which will be carried out for the first time in July 2023 in line with the general act of the Energy Agency.

Due to the above, the electricity distribution companies, in cooperation with SODO and with technical implementation by Informatika d.d., began conducting mass data analysis with the aim of achieving the required data quality in time. It is the responsibility of SODO and the EDC to make sure that suitably technically equipped consumers are not discriminated against and that they can make use of the potentials and benefits of the reform.

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119 Filled columns indicate poor data quality or some other anomaly, e.g. the wrong interpretation of the indicator calculation methodology
120 Power Line Communication

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 2022. In the framework of its 2022 assessment of concentration, the Slovenian Competition Protection Agency issued a decision on the concentration of the companies ECE d.o.o. and part of the property of E.ON Ljubljana d.o.o., in which it did not oppose the concentration, declaring that it is in compliance with the competition rules (Decision of the 15 July 2022) and did not oppose the notified establishment of a joint venture by EPEXSPOT S.E., ELES d.o.o. and Akcionarsko društvo »Elektromreža Srbije«, as well as the acquisition of joint control of BSP by EPEXSPOT, ELES and BSP Energetska borza d.o.o., and declared that the concentration is compatible with the competition rules (Decision of 7 November 2022).

Active Consumption, Flexibility Market and Other Development-Related Aspects

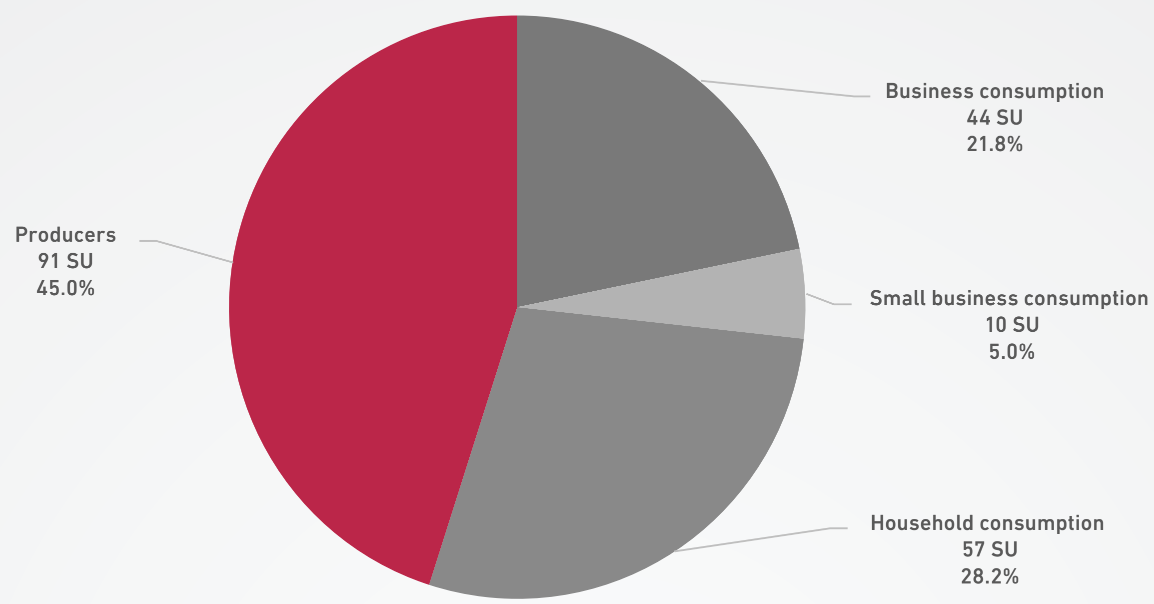
In 2021, the Electricity Supply Act came into effect, containing the key provisions of the Clean Energy for All Europeans package necessary to empower active consumers and to introduce citizen energy communities, consequently enabling the free development of active consumption and independent aggregation. Based on that act, amendments to secondary legislation and other general acts were introduced in 2022.

Five active aggregators in the Slovene market

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

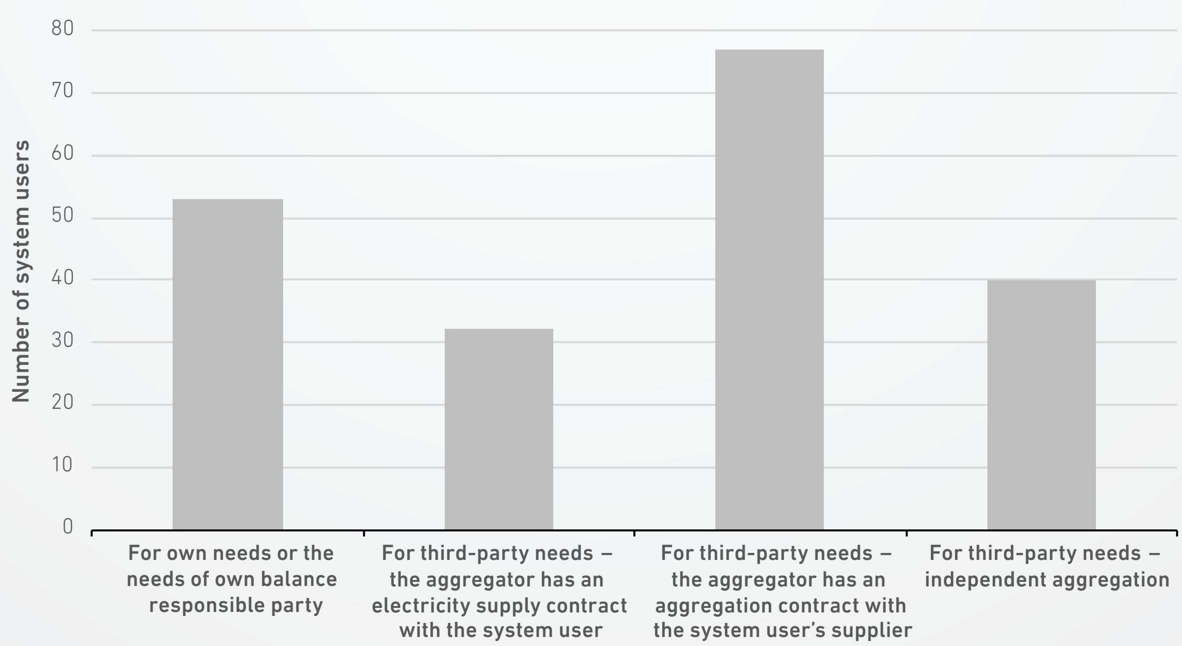
According to the aggregators, their portfolios in 2022 included 202 consumers in addition to their own flexibility resources, which the aggregators estimate to have contributed a total of 1.05 GWh of flexible energy. A particular consumer can be included in several portfolios at the same time.

FIGURE 145: STRUCTURE OF CONSUMERS (C) IN THE AGGREGATION, WHERE STORAGE AND GENERATION DEVICES MAY ALSO BE CONNECTED BEHIND THE DELIVERY POINT



SOURCES: AGGREGATORS

FIGURE 146: NUMBER OF CONSUMERS IN PORTFOLIOS COVERING VARIOUS NEEDS, WHERE A USER MAY BE INCLUDED IN SEVERAL PORTFOLIOS

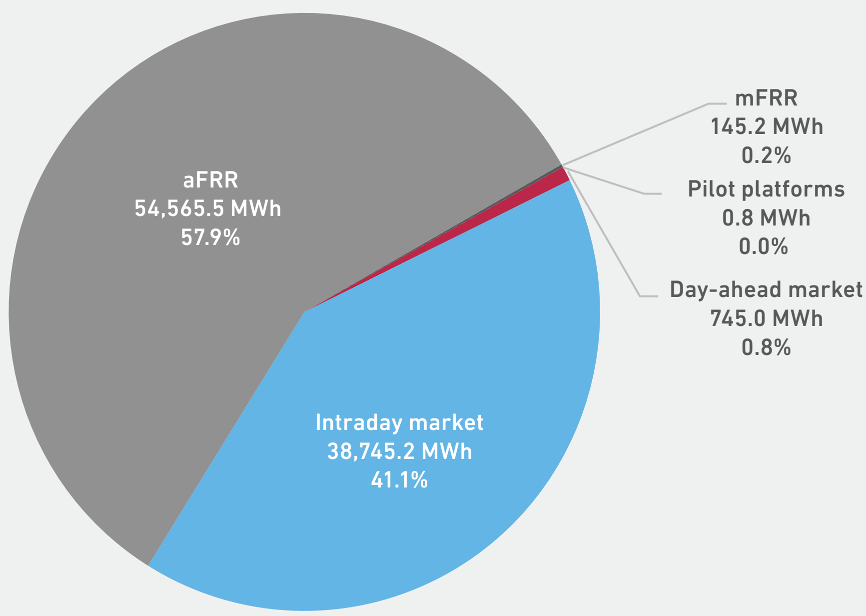


SOURCES: AGGREGATORS

Aggregators traded energy in the day-ahead Market, the intraday Market, the ELES ancillary services market and on pilot platforms to exploit flexibility for distribution needs. Figures 147 to 150 show the energy shares by individual markets or services, calculated as the sum of the energy purchases (or production reduction and/or consumption increase) and energy sales (or production increase and/or consumption reduction) in these markets. The total amount of energy traded by aggregators is determined as the sum across all the markets and amounted to 94.2 GWh.

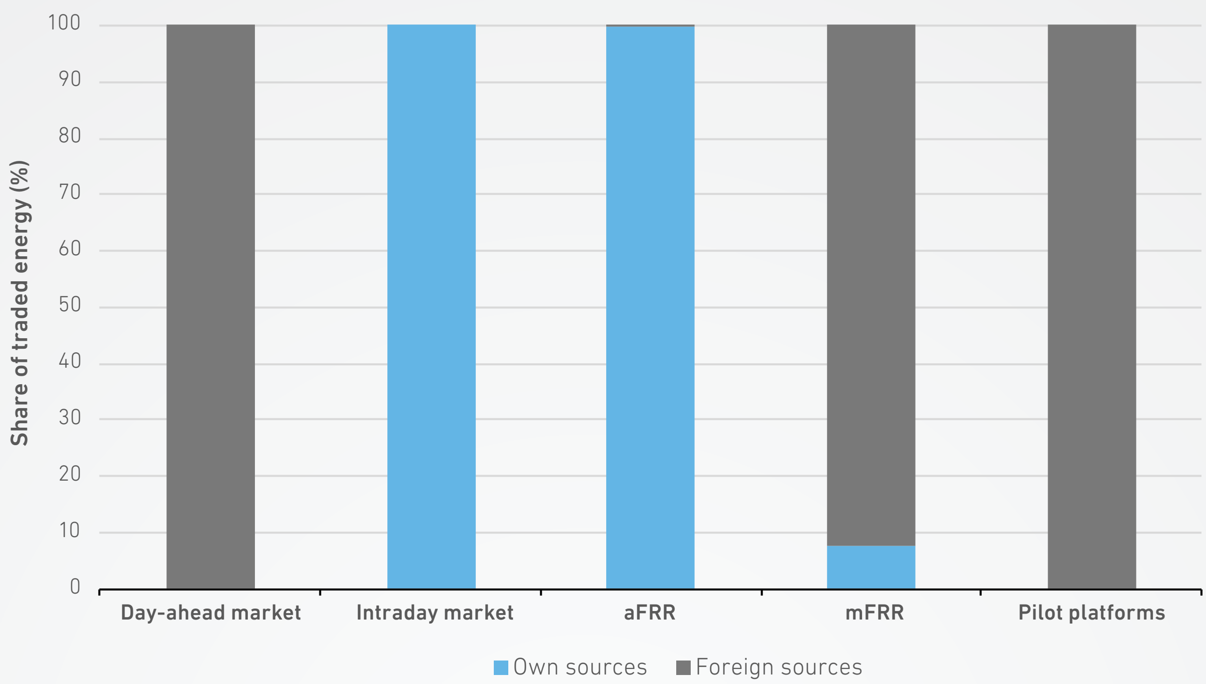
94.2 GWh of energy traded by aggregators

FIGURE 147: STRUCTURE OF TRADED ENERGY FROM AGGREGATION BY MARKET OR SERVICE AND THE CORRESPONDING SHARES



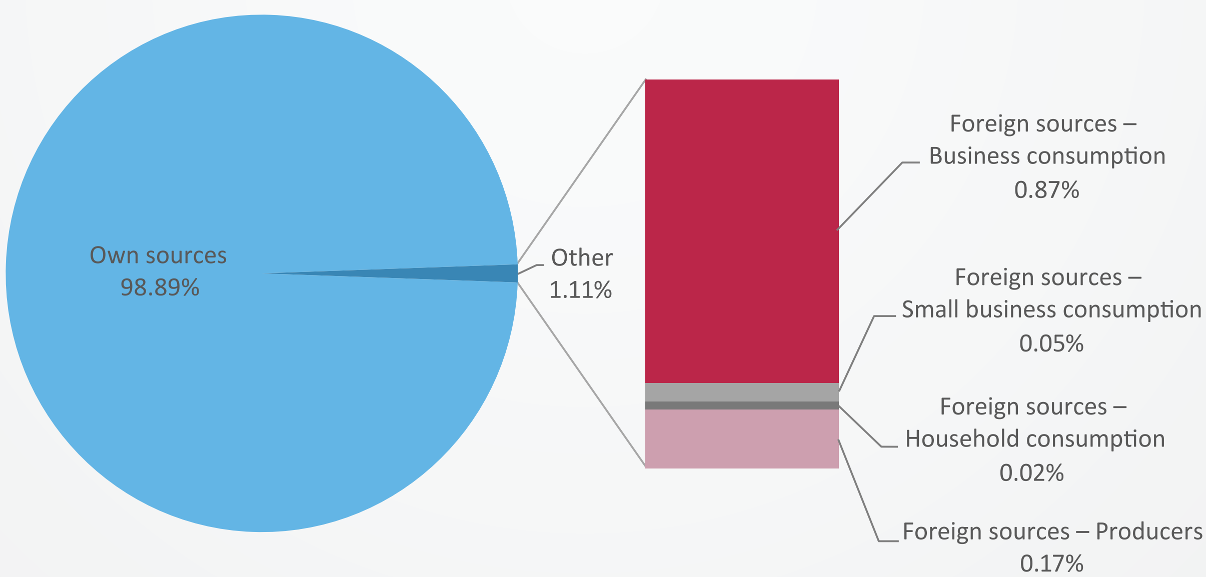
SOURCES: AGGREGATORS

FIGURE 148: MARKET SHARES OF TRADED ENERGY ACCORDING TO THE OWNERSHIP OF RESOURCES



SOURCES: AGGREGATORS

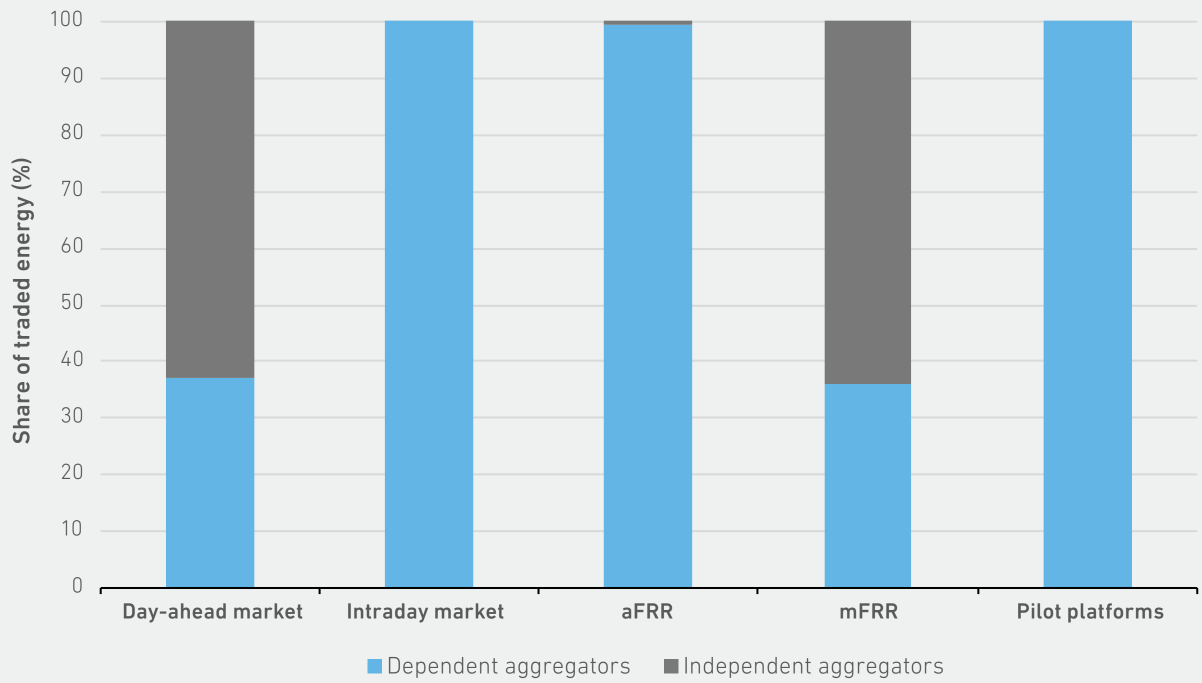
FIGURE 149: STRUCTURE OF THE SOURCES OF TRADED ENERGY FROM AGGREGATION IN TERMS OF THE 94.2 GWh TOTAL



SOURCES: AGGREGATORS

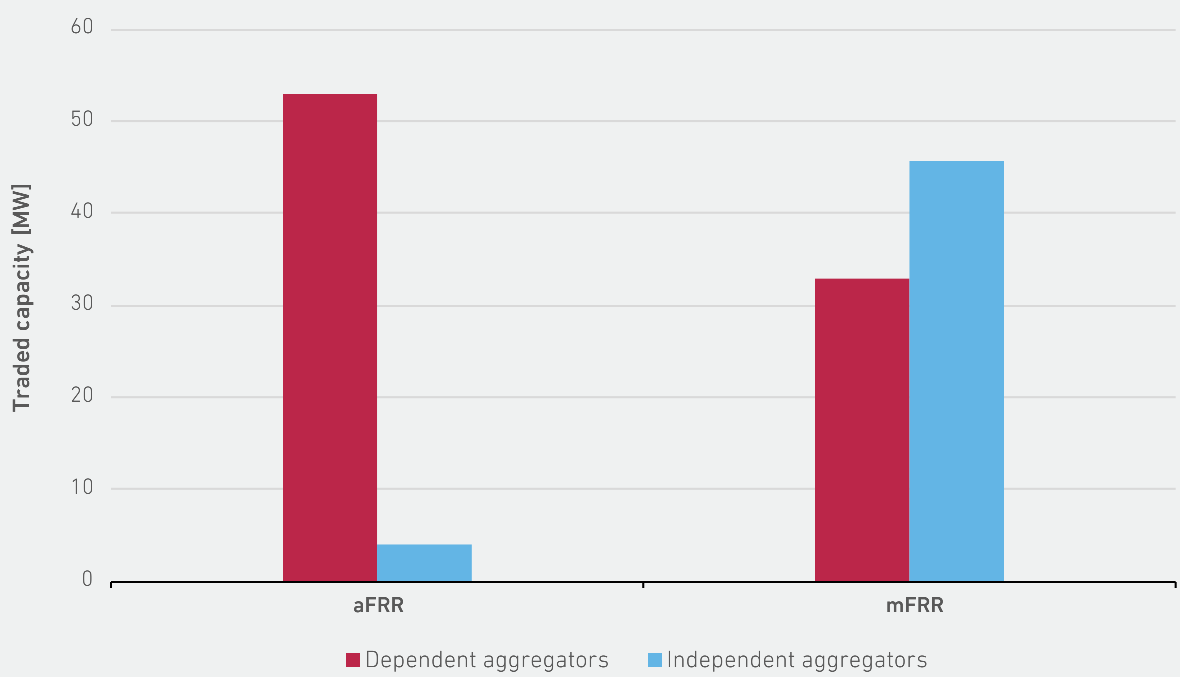
The role of an aggregator in the electricity market can be assumed by an independent aggregator or an electricity supplier. At the end of 2022, 17 electricity suppliers were active on the Slovenian electricity market, of which four (Elektro Energija, Gen-I, NGEN, Petrol) were also active in aggregation. Kolektor sETup entered the market in 2022 as the only aggregator that is not an electricity supplie.

FIGURE 150: MARKET SHARES OF TRADED ENERGY ACCORDING TO THE CONNECTION BETWEEN THE AGGREGATOR AND THE SUPPLIER



SOURCES: AGGREGATORS

FIGURE 151: TRADED CAPACITY ACCORDING TO THE CONNECTION BETWEEN THE AGGREGATOR AND THE SUPPLIER[121]



SOURCES: AGGREGATORS

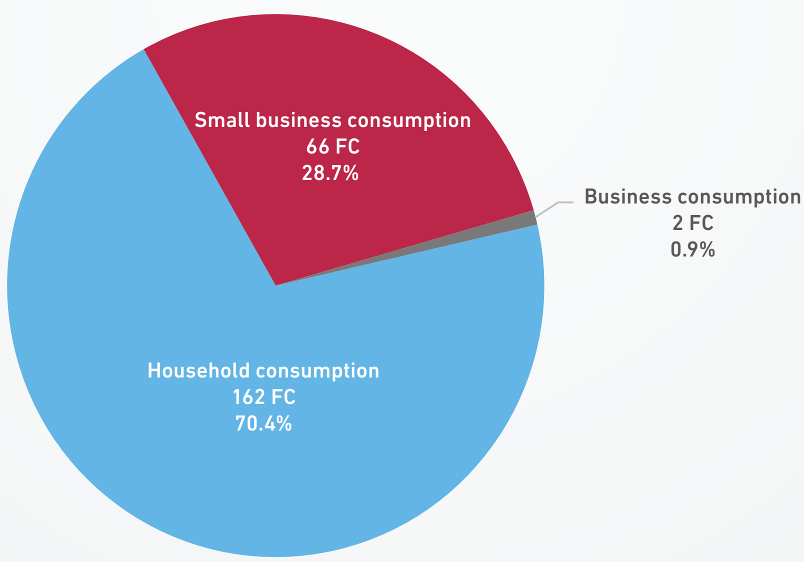
121 The shares of leased capacity by market or service are calculated as the sum of capacity leased to reduce generation or increase consumption and capacity leased to increase generation or reduce consumption in those markets.

Data on the included consumers and independent aggregation show that despite the operation of five 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 the flexible energy is offered through independent aggregation. The vast majority of independent aggregation is reflected in the day-ahead market and the provision of mFRR, which together account for only a small proportion of the total energy traded under aggregation. This suggests that the engagement of active consumption through either dependent or independent aggregation in the Slovenian electricity market has not yet reached the level of maturity.

In 2021, the Act on the Promotion of the Use of Renewable Energy Sources entered into force as well, enabling community self-supply, the self-supply of multi-dwelling buildings, the self-supply of communities for supplying energy from RES and the self-supply of the renewable energy community, which is also a legal entity. This, together with citizen energy communities according to the ESA, concludes the set of possible communities in the field of the self-supply of electricity. Data from suppliers show that 27 new self-supply communities were established in 2022, involving a total of 102 final consumers[122]. Taking into account the data from the previous year, we estimate that suppliers served a total of 230 final consumers included in various communities[123]. The total amount of electricity supplied to final consumers in the communities amounted to 696 MWh, while the total amount of electricity taken from the communities free of charge amounted to 194 MWh.

27 new self-supply communities

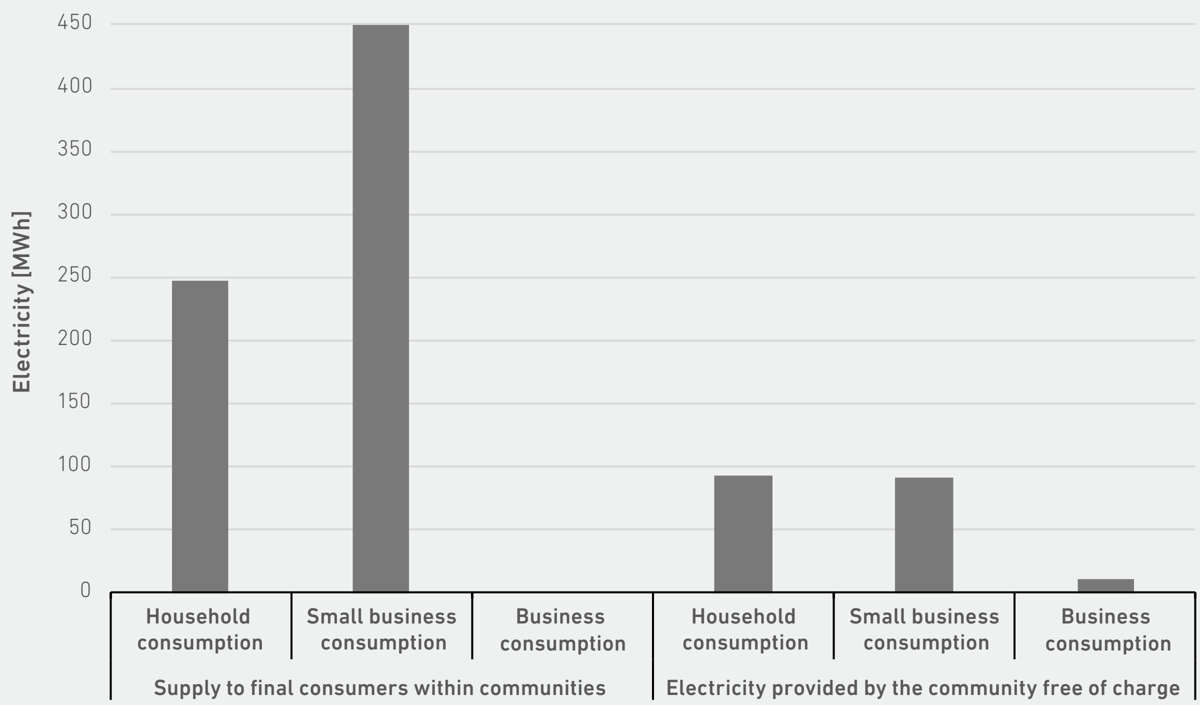
FIGURE 152: STRUCTURE[124] OF FINAL CONSUMERS INCLUDED IN COMMUNITIES



SOURCES: SUPPLIERS

122 Data provided by suppliers and by the DSO can differ due to various levels of realisation of individual communities.
123 Consumers were associated in self-supply communities in accordance with Article 72 of the Act on the Promotion of the Use of Renewable Energy Sources, which allows for annual netting.
124 The difference between the total and the sums of the individual shares is due to rounding to one decimal place.

FIGURE 153: A COMPARISON OF AGGREGATED ELECTRICITY SUPPLIED TO CONSUMERS IN THE COMMUNITIES WITH THE AGGREGATED ELECTRICITY TAKEN FROM THE COMMUNITIES FREE OF CHARGE



SOURCES: SUPPLIERS

The Electricity Supply Act enables, inter alia, the exchange of electricity between active consumers within the same balance-responsible party. In 2022, two platforms were active for this purpose, one operated by SunContract[125] and the other by NGEN[126]. The estimated volume of trading was 8.55 GWh. 456 household consumers, 416 small business consumers, 57 business consumers, 86 producers (RES and generation directly connected to the distribution network) and 53 active consumers (owners of generation plant, storage, etc.) participated in the trading.

125 https://suncontract.org/si/elektricna-trznica-proizvajalce-odjemalce-energije/
126 Only SunContract has energy exchange based on a peer-to-peer concept.

Encouraging Active Consumption by Reforming the Network Billing System

Decarbonisation of the energy sector is a key step towards achieving a climate-neutral society. This process is not only about investing in cleaner sources of production, but also about changes in energy consumption. We need to harness the potential of digitalisation and the development of new technologies, and connect all sectors of energy consumption. But the backbone of the green transition is the electricity network, in particular the distribution network, the development costs of which will require more than EUR 2 billion of additional resources over the next 10 years according to estimations by the NECP. This will have a significant impact on the network charges paid by electricity consumers. Electricity operators must strive to integrate distributed generation sources into the system in a cost-effective manner, as well as new burdens arising from the increasing use of heat pumps and the electrification of transport. A cost-effective and socially fair green transition is based on energy efficiency and demand response, and focuses on the active role of both household and business consumers, as well as the industry. By changing energy consumption, we can influence the current and future costs associated with the green transition, while allowing renewables and other loads to be integrated more quickly into the system. Consumers must therefore be able to participate in all forms of demand response.

As the sector regulator, the Energy Agency must, on the basis of European legislation, provide electricity system operators with conditions in which they can benefit from flexibility and give price signals to system users to use networks as efficiently as possible. In this way, electricity system operators will be able to avoid or at least postpone certain investments in the network, while consumers will be able to contribute to lower network charges and optimise their costs of electricity. This is precisely what the reform of the network charging methodology aims at.

With increased time differentiation, stronger price signals and the gradual introduction of additional charging for excessive capacity, the new tariffs for the use network will encourage consumers to use the network more efficiently or to adjust their consumption. Network charges will continue to be defined based on power and energy, while the key innovations of the new network charging methodology are:

- the introduction of new time slots,
- the distinction between contracted and excessive capacity, and
- increased cost burden on tariff rates for connected load.

The efficient use of networks - the Energy Agency introduced a new method of calculating the network charge

The network tariff rates for billed capacity and energy will differ according to individual time slots. They will be highest in the periods with the highest loads and lowest in the periods with the lowest loads. In this way, the price signal will incentivise consumers to adjust their consumption and influence both current and future costs of network use.

Under the current methodology (M**) of calculating the network charge, a consumer could not influence the level of the network charge for connected load. This will change with the new methodology (M1), as the agreed billed capacity for each consumer will be pre-determined by the electricity system operator on the basis of the individual's actual consumption profile over the previous period. The agreed billed capacity will therefore reflect past electricity consumption patterns and will be determined individually for each consumer. The consumer will be able to change this pre-determined agreed billed capacity according to their expected consumption.

The third key novelty is the significantly higher cost burden on tariff rates for connected load compared to the tariff rates for energy, with respect to the previous distribution of network costs, where the tariff rate for energy represented the larger part. As network costs are mainly related to network capacity and network peak load, which indicate a need for possible network reinforcement, it is right that they are covered to a greater extent by the tariff rate for connected load.

Compared to the current methodology, the new M1 methodology, which is compliant with the legislation, introduces a series of benefits that can be divided into explicit (implemented methodologically, marked with *) and implicit in the form of the so-called »M1 Concept«:

UČINKOVITA RABA OMREŽIJ

THE URO-M1

01

Spreads the costs more fairly between consumption groups*: alleviating the costs of typical household consumption

02

Systemically encourages active consumption: and thus a more efficient use of the network*

03

Allows the dynamic adjustment of the consumer's billed capacity in proportion to the use of the network*

04

Takes into account the benefits of distributed RES generation*: asymmetric tariff (producers do not pay for the use of the grid)

05

Encourages more optimal investments in RES capacity on the consumption side and supports the efficient integration of RES into the grid*, especially in combination with battery storage

06

Maximises the net benefits on the consumption side by promoting appropriate investment strategies on the consumption side* supported by subsidies from the Slovenian Environmental Public Fund (Eco Fund)

07

Ensures the fair billing of network charges for members of energy communities*: with incentives supporting national strategies[127]

08

Supports energy transition through the electrification of heating/cooling and traffic* as envisioned in the E8 Concept[128] and seasonal decreases of EV charging costs during the periods of increased transit in the low season

09

Reduces the negative impact of the annual consumption netting (»net metering«) scheme on network charge revenue*

127 Integration of large RES generation facilities
128 https://www.e8concept.com/sl

CONCEPT

10 Overcomes the problem of the negative impact that participating in flexibility markets has on other cost components of the final supply price*: exemption from network charges during the provision of system services

11 Ensures equal treatment of energy storage facility operators in the flexibility market*

12 Allows the use of dynamic network charge tariffs* on the energy network charge with time discrimination by the electricity system operators for resolving local overloads

13 Ensures equitable network charge determination for final consumers without smart meters or otherwise lacking the facilities to provide 15-minute usage data*

14 Facilitates a simplified understanding of time blocks through a »traffic light« paradigm (green, yellow and red): it is ensured that the periods of increased system load, and hence higher tariffs, are synchronised with the existing higher tariff

15 Promotes the digitalisation of the distribution system: it is based on 15-minute usage data, which must be provided to all final customers at the level of the national data hub (mojelektro.si) in the form of standardised data services

16 Stimulates the development of new business models in the area of electricity supply and the use of demand-side flexibility – dynamic prices in the context of the model of split supply market and local network charge tariffs*

17 Maximises the benefits of the consumer's choice on the retail market and improves market competitiveness: the choice of a customised electricity supply product in combination with the adjustment of contracted capacity

Enables an implicit system campaign to raise awareness of the green transition among the users of the electricity system

CASE STUDY
Promoting the Efficient Use of the Network Through Price Signals Through the New Network Use Tariff: Achieving Demand-Side Benefits

By using the network efficiently on the basis of the price signals of the new network charge calculation methodology, the active consumer can provide net benefits for the operation of the wider network. The new network charge tariff system, which will come online in 2024, stimulates active consumption and the optimisation of investments into RES. This relieves the pressure on the incremental network costs, indirectly benefitting all final consumers, while bringing significant individual financial benefits in return for making active efforts to reduce the load on the network.

Below, we quantify the benefits for a representative active household consumer on the basis of a realistic 15-minute demand profile and a simulation of demand response and investments into RES or battery energy storage.

HC (7 kW | 2.5 < 5 MWh/a) – average household

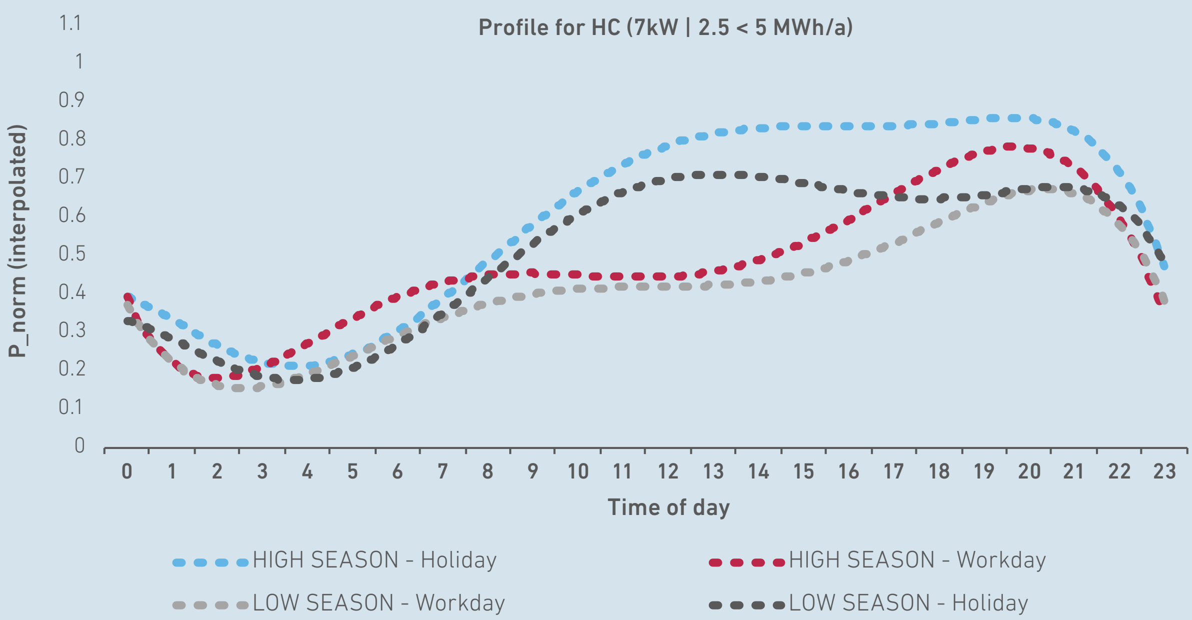
For a household consumer (HC) in a group with an energy consumption cd = 2.5 < 5 MWh/a, billed capacity Cc = 7 < 14 kW (Figure 154) and the demand profile shown in Figure 155, several efficient network use scenarios were simulated. The HC under analysis has the following large consumers: domestic water heater | washing machine/dishwasher | stove+oven.

FIGURE 154: THE NUMBER OF CONSUMERS IN CONSUMER GROUP OF THE SELECTED HOUSEHOLD CONSUMER (HC) (7 kW | 4500 MWh/a)

Household consumption	1 < 2,5 MWh/a	2,5 < 5 MWh/a	5 < 15 MWh/a	> 15 MWh/a
< 6 kW	61,544	67,532	33,608	
7 < 14 kW	111,283	132,484	99,876	5,227
17 kW	31,720	65,714	77,848	12,101
> 22 kW	1,980			1,518

SOURCES: ENERGY AGENCY, SODO, EDC

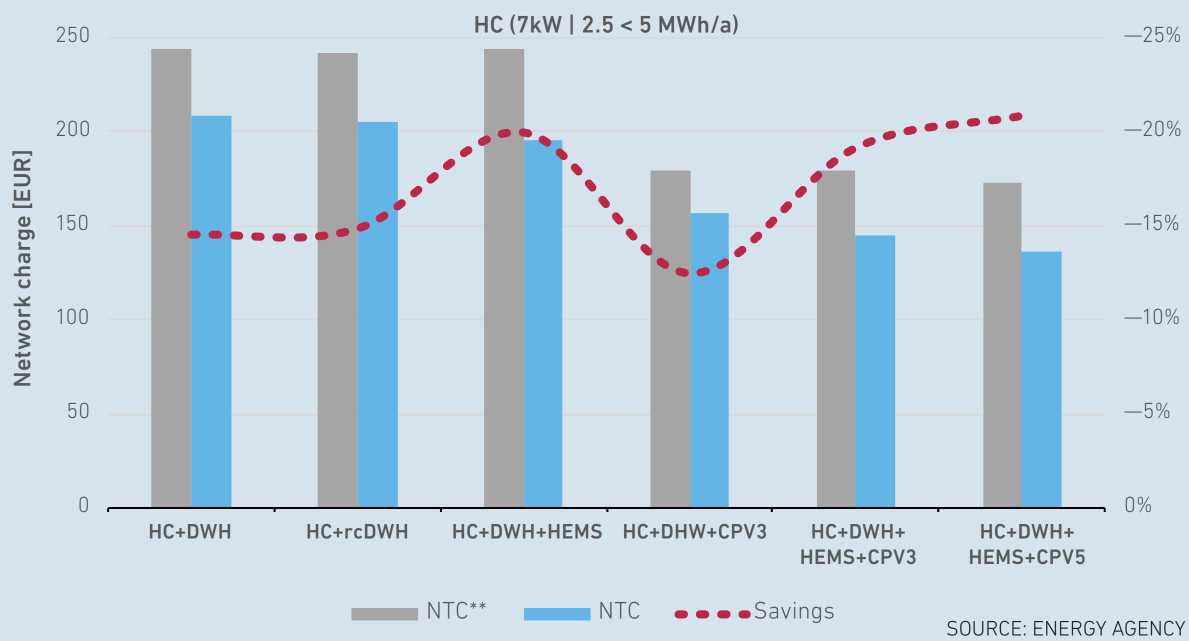
FIGURE 155: THE HOUSEHOLD CONSUMER (HC)'s DEMAND PROFILE (7 kW | 4500 MWh/a)



SOURCE: ENERGY AGENCY

The demand and consumer activity scenarios presented in Figure 156, involve control of a domestic water heater (HC+rcDWH[129]), a home energy management system (HC+DWH+HEMS[130]), participation in community self-supply (HC+DWH+CPV_3[131]) and a combination of the more/less extensive participation of the HC in self-supply with control of household appliances (HC+DWH+HEMS+CPV_3 | CPV_5[132]).

FIGURE 156: THE DIFFERENCE IN THE NETWORK CHARGE (THE SAVINGS) OF THE NEW M1 METHODOLOGY (NTC) COMPARED TO THE CURRENT METHODOLOGY M (NTC**) BY CONSUMER ACTIVITY**



SOURCE: ENERGY AGENCY

129 Domestic water heater (DWH) | remotely controlled domestic water heater (rcDWH)
130 Home Energy Management System
131 Share in community self-supply (3.5 kWp)
132 Share in community self-supply (5 kWp)

The simulations complement the cost analysis performed for the synthetic profile of the HC group as a whole (7 kW < 14 kW | 2.5 < 5 MWh/a) for a particular consumer from the group under observation[133]. The most important findings from the simulations of M1 use are:

- NTC reduced by roughly 1.5% (scenario involving scheduling domestic water heater operation);
- NTC reduced by roughly 6% (scenario with domestic appliances controlled through HEMS);
- NTC reduced by roughly 25% (scenario involving participation in community self-supply);
- NTC reduced by roughly 31–35% (scenario involving participation in community self-supply in combination with HEMS);

For the non-temperature-dependent HC under observation, the simulations suggest that through the automatic scheduling (using a simple HEM system) of a certain set of large consumers (domestic water heater) or smart household appliances, significant savings in network charges can be achieved. However, integrating the HC into community self-supply by purchasing 3.5 kWp (CPV_3) can bring significant further benefits while supporting an important aspect of the optimisation of leased capacity in the community. A comparison with the current methodology M** also suggests network charge savings from transitioning to the new M1 methodology, with room for significant further increases through the automatic control of devices and appliances and eventual integration into an energy community. For the HC under observation, the simulations show that, assuming an equal scope of investments, none of the demand response scenarios indicate any benefit to the M** methodology, nor does participation in an energy community. The network charge using the M1 methodology and depending on the particular »activity« scenario is also reduced by approx. 12–20% compared to M**, since the billed capacity can be adjusted, whereas the network charge costs in M** can only be reduced by reducing energy (billed capacity remains constant – for the HC under observation, Cc = 7 kW).

HC_HP (10 kW | 5 < 15 MWh/a) – Average HC with heat pump

For a household consumer with a heat pump (HC_HP) in a group with energy consumption cd = 5 < 15 MWh/a, billed capacity Cc = 7 < 14 kW (Figure 157) and the demand profile shown in Figure 158, several scenarios of efficient network use were simulated. The HC_HP in question has the following large consumers: dishwasher/washing machine | stove+oven | electrical bathroom heater | American-style fridge.

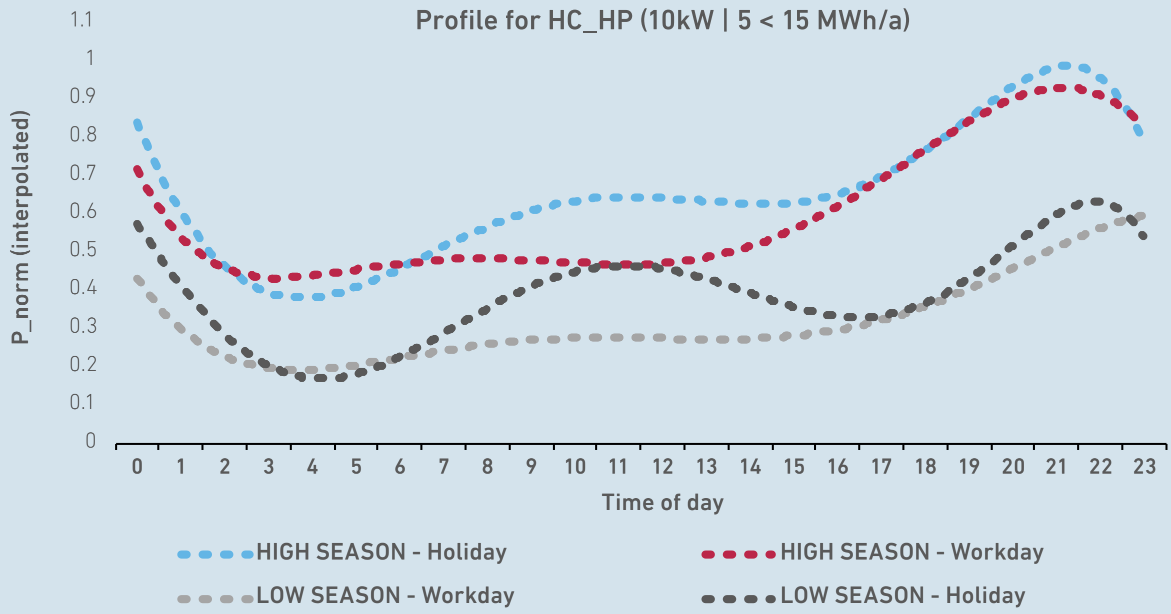
FIGURE 157: THE DEMAND PROFILE OF A HOUSEHOLD CONSUMER WITH A HEAT PUMP HC_HP (10 kW | 9500 MWh/a)

Household consumption	1 < 2,5 MWh/a	2,5 < 5 MWh/a	5 < 15 MWh/a	> 15 MWh/a
< 6 kW	61,544	67,532	33,608	
7 < 14 kW	111,283	132,484	99,876	5,227
17 kW	31,720	65,714	77,848	12,101
> 22 kW	1,980			1,518

SOURCES: ENERGY AGENCY, SODO/EDC

133 https://www.agen-rs.si/documents/10926/106759/D7_AGEN_Reforma_Obra%C4%8DunOMR-TarifniSistem_SLO_V6/132abc24-10b5-4b6e-a5b2-bf4c055c5c3f

FIGURE 158: THE DEMAND PROFILE OF A HOUSEHOLD CONSUMER WITH A HEAT PUMP HC_HP (10 kW | 9500 MWh/a)



SOURCE: ENERGY AGENCY

In terms of demand scenarios and consumer activities, we looked at the installation of a small-scale solar power plant (HC_HP+PV_5), the installation of a larger solar power plant (HC_HP+PV_{11}) and the addition of a small battery electric storage system ($BESS_5$)[134] in combination with both scenarios of solar power plant installation (PV_5 | PV_{11})[135].

The simulations in Figure 159 complement the cost analysis performed for the synthetic profile of the HC group as a whole (7 kW < 14 kW | 5 < 15 MWh/a) for a particular consumer from the group under observation[136]. The most important findings from simulations of M1 use are:

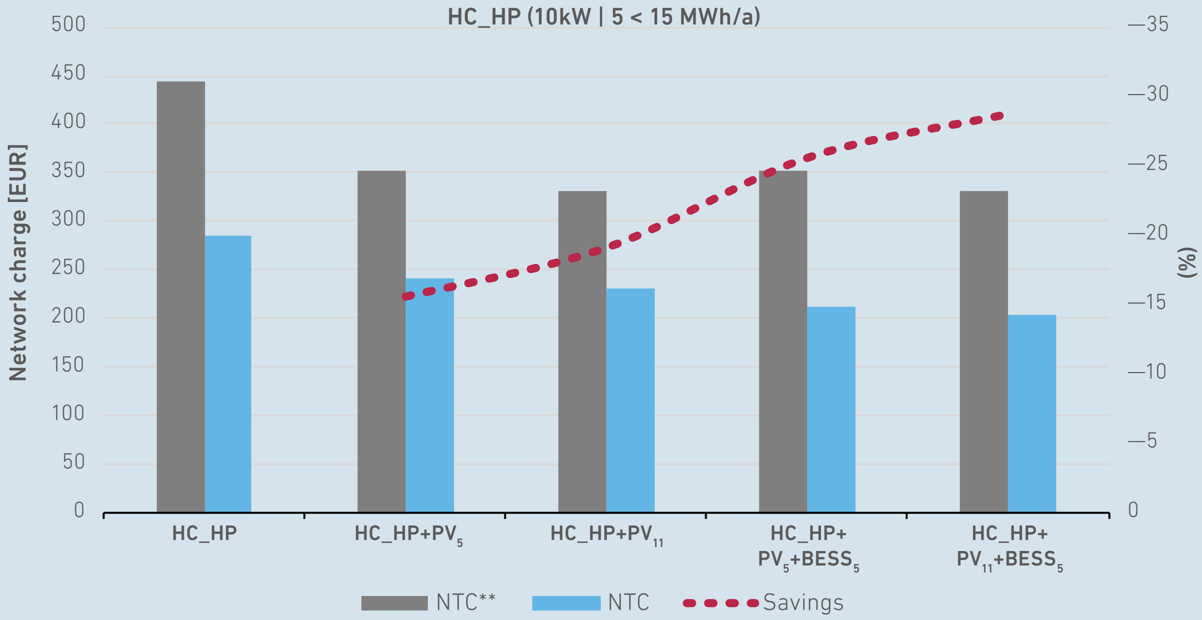
- NTC reduced by roughly 16% at PV_5 | 19% at PV_{11}
- NTC reduced by roughly 26% at PV_5 +$BESS_5$ | 29% at PV_{11}+$BESS_5$

For the selected profile HC_HP, the savings achieved by connecting the PV are relatively modest, approximately 16% | 19%. **Simulations indicate that a smaller PV_5 is enough for self-supply** (we could actually go for an even smaller one)[137]. For a substantial increase in savings, a $BESS_5$ is needed producing 26% | 29%.

The $BESS_5$ load profiles indicate that, in the absence of the high-intensity smoothing of achieved capacity, BESS allows participation in market services (both seasons), or only in the low season with high-intensity smoothing. Additional potential benefits of participating in ancillary services are approximately EUR 40 for the small $BESS_5$; with the larger storage system (BESS 13.5 kWh | 5 kW), the estimated savings are twice that, at EUR 80 (the calculations were on the basis of the regulated single tariff).

134 BESS with a 5 kW rated discharge capacity
135 Solar power plant with 5 kWp rated capacity (PV_5) | Solar power plant with 11 kWp rated capacity (PV_{11})
136 https://www.agen-rs.si/documents/10926/106759/D7_AGEN_Reforma_Obra%C4%8DunOMR-TarifniSistem_SLO_V6/132abc24-10b5-4b6e-a5b2-bf4c055c5c3f
137 This is assuming the consumer is not part of an annual electricity netting scheme.

FIGURE 159: SIMULATED SAVINGS FOR HC_HP (10 kW | 5 < 15 MWh/a)

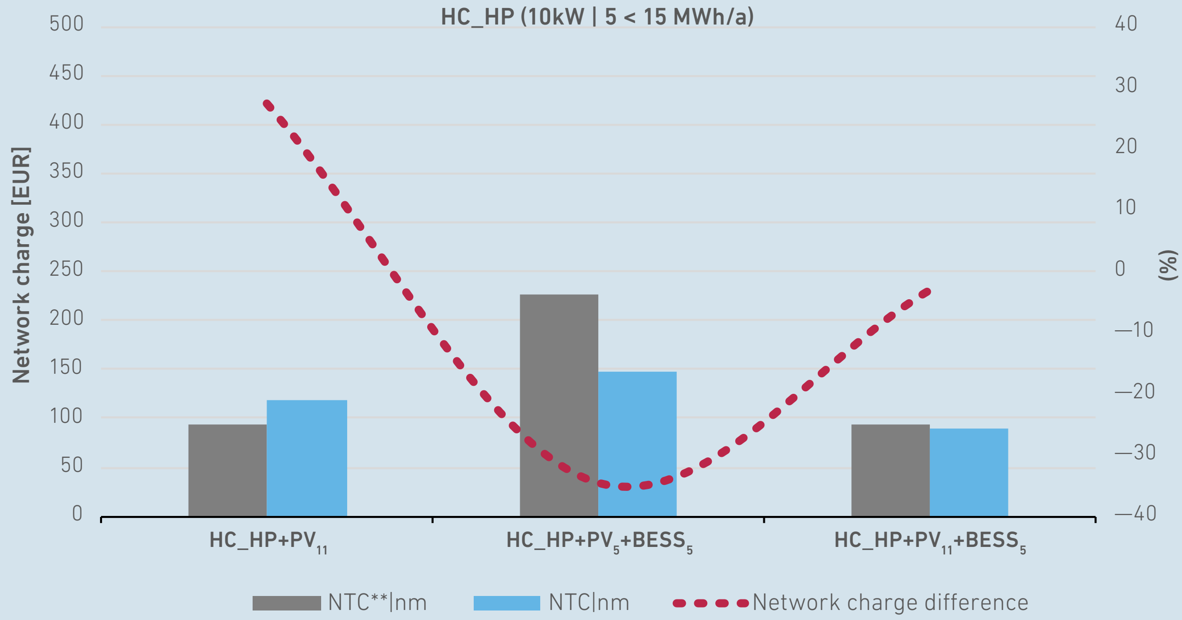


SOURCE: ENERGY AGENCY

The analyses of self-supply simulations for the selected HC_HP show a distinct signal in favour of optimising investments into a suitable combination of PV_5 (5 kWp) and $BESS_5$ (4.6 kWh | 2.8 kW), which brings larger network charge savings (the 3rd and 4th columns) than an investment in PV_{11} that, in theory, is comparable in terms of costs (a »standard« capacity of 11 kWp) – the difference in the network charge is approx. 7%.

If we also compare the costs of an HC with self-supply in an annual consumption netting scheme, calculated per the M1 methodology, the costs depend to a greater extent on the potential energy shortfalls at the annual level. If these are present, the M1 methodology provides lower costs, but if the annual consumption is at least covered by the production, the costs are slightly higher (Figure 160). In the latter case, an investment in the small BESS would yield comparable costs. Self-supply in a »net metering« scheme, which does not cover consumption by generation, shows a cost advantage when applying the new M1 methodology.

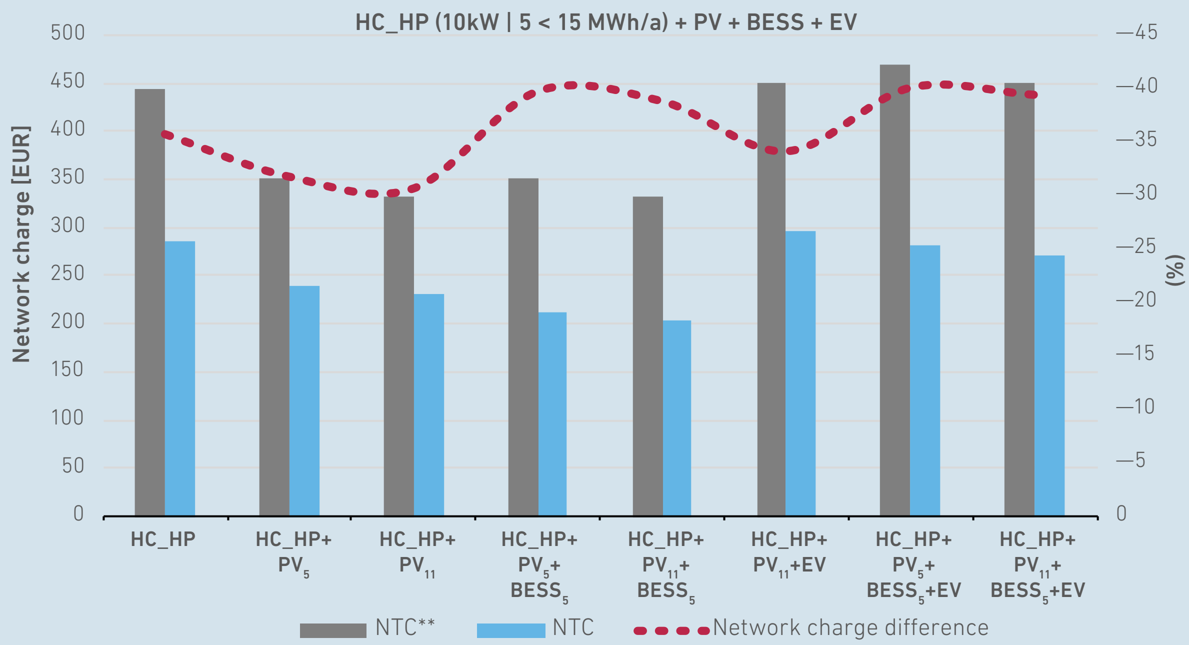
FIGURE 160: DIFFERENCES IN NETWORK CHARGE FOR SELF-SUPPLY WITH »NET METERING« (nm) M | M1**



SOURCE: ENERGY AGENCY

Adding the impacts of electric vehicle (EV) charging to the existing configurations, the simulations show that the new M1 methodology is significantly more favourable for vehicle electrification, as it allows for lower network charge costs than the current M** methodology. The simulations point to the same conclusions as for a typical HC consumer from the largest sub-43 kW consumer group – for the HC_HP consumer under observation, none of the demand response scenarios show any advantage to M** for the same level of investment, nor for joining an energy community when it comes to a representative HC or of increasing consumption through EV charging (Figure 161).

FIGURE 161: COMPARING ALL THE SCENARIOS AND BENEFITS OF THE NEW M1 METHODOLOGY AND THE SAVINGS ACHIEVED WHEN CHARGING EVs



SOURCE: ENERGY AGENCY

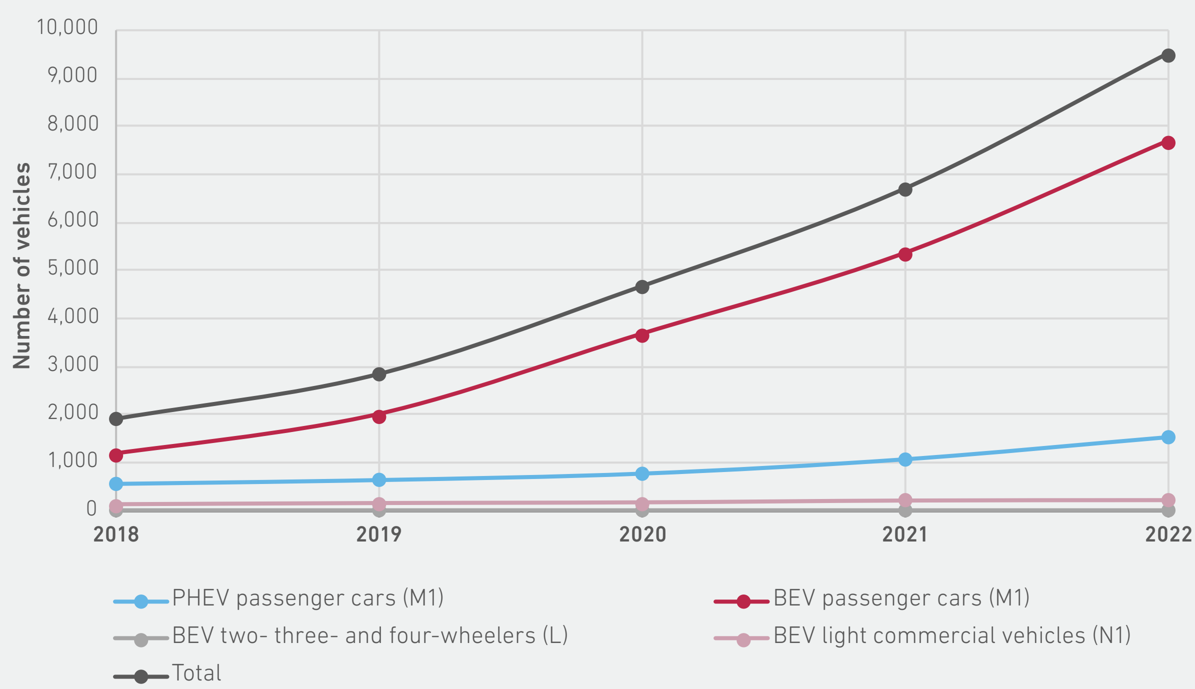
Electromobility

The Energy Agency monitors the development of electromobility from the point of view of the development of the electricity market. As e-mobility booms, electric vehicles can be expected to join the flexibility market with so-called smart charging, where charging parameters can be adjusted according to the needs of the vehicle's user, as well as those of the electricity system. In 2022, the Energy Agency continued promoting the development of the charging infrastructure with network charge tariffs earmarked for connecting recharging stations and using the network.

A 41.8% increase in the total number of electric vehicles

In Slovenia, the total number of electric vehicles in 2022 was 9494[138], an increase of 41.8% compared to the previous year. Like the year before, the biggest contributor was battery electric vehicles (BEVs). In the category of passenger vehicles (M1), their number increased by 2330 vehicles, which represents a 43.6% increase compared to the year before. The number of plug-in hybrids (PHEV) in the same category increased by 458 vehicles or 42.1% compared to the previous year. The number of light commercial BEVs (category N1) grew by 10, which means a 4.3% increase compared to the previous year. The number of light BEVs, which include two-, three- and four-wheel vehicles (category L), remains the same as the year before. Figure 162 shows the trend in the number of electric vehicles in Slovenia by the above-mentioned categories, indicating a constant increase in the total number of electric vehicles. Taking into account the figure of 1,299,361 of all M1 and N1 vehicles in Slovenia, the overall share of electric vehicles in these two categories in Slovenia is 0.73%. At the EU level, the comparable figure is 2.1%, while the comparable figure for Sweden, which has the highest share of electric vehicles among the EU countries, is 8.88%.

FIGURE 162: NUMBER OF REGISTERED ELECTRIC VEHICLES IN SLOVENIA



SOURCE: EAFO

138 Data as of 3 May 2023 (Source: European Alternative Fuels Observatory – EAFO)

Compared to the previous year, the number of new registrations[139] in the M1 and N1 categories in Slovenia shows a slightly larger increase in the introduction of electric vehicles in the vehicle fleet. In the L category, there were no new registrations of vehicles in 2022. The total number of newly registered electric vehicles in Slovenia has increased by 50% compared to the previous year[140]. As shown in Table 31, that figure at the EU level is quite different as the number of newly registered passenger vehicles of those categories in the whole EU has grown by 17%, which indicates a settling trend compared to the year before. For Sweden, the country with the highest share of electric vehicles in the EU, this figure is 19% and also showing a settling trend compared to the previous year. On the whole, the structure of new registrations by category and the proportion of PHEVs and BEVs within each category is different in the EU than in Slovenia.

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

		Slovenia			European Union		
		2021[141]	2022	2022/2021 Ratio	2021[142]	2022	2022/2021 Ratio
Passenger Vehicles (M1)	BEV	1,688	2,319	137%	873,612	1,117,053	128%
	PHEV	284	626	220%	865,752	881,573	102%
Light Vehicles (L)	BEV	0	0	/	95,917	136,691	143%
	PHEV	0	0	/	0	0	/
Commercial Vehicles (N1)	BEV	47	91	194%	43,725	60,569	139%
	PHEV	0	0	/	1,519	2,031	134%
	Total	2,019	3,036	150%	1,880,525	2,197,917	117%

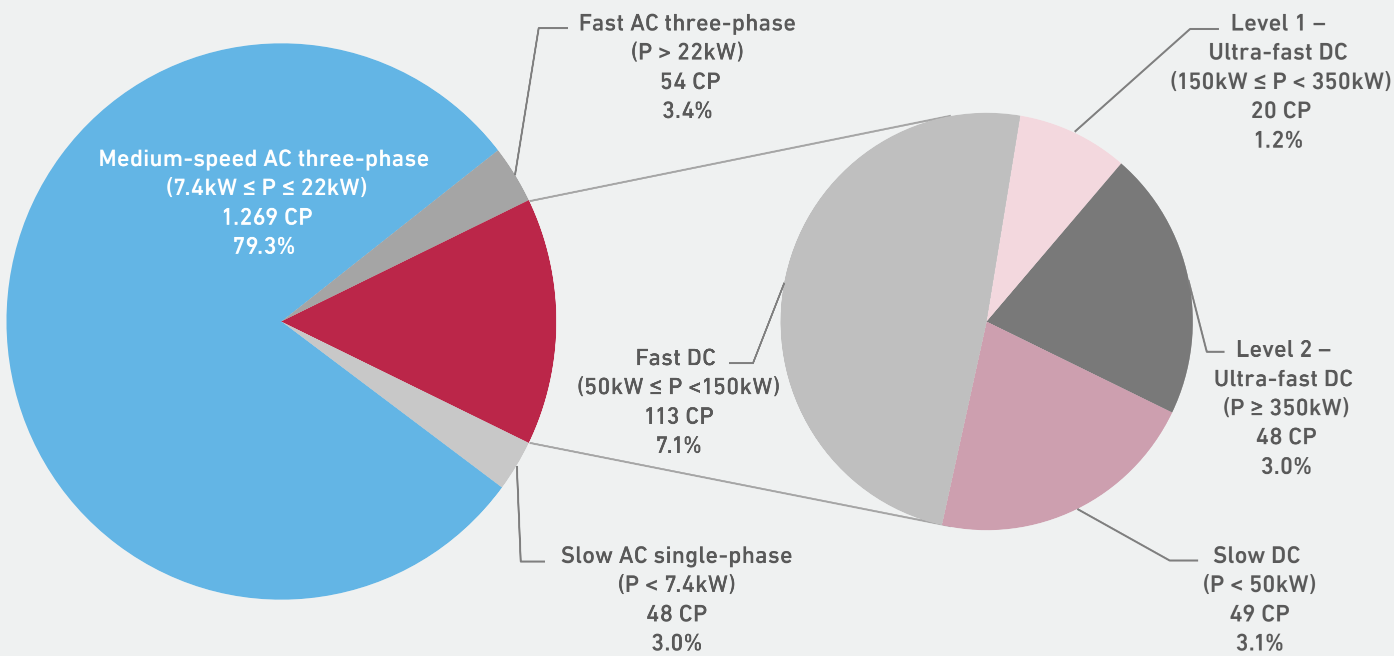
SOURCE: EAFO

139 Data as of 3 May 2023 (Source: EAFO)
140 The volatile updating of the data source enables the total compliance of the data according to individual years reported by the Energy Agency.
141 The EAFO data was changed in line with the Report on the Energy Situation in Slovenia in 2021.
142 The EAFO data was changed in line with the Report on the Energy Situation in Slovenia in 2021.

According to EAFO[143] data, there were a total of 1601[144] public[145] recharging points[146] in Slovenia in 2022. Taking into account the data on the number of electric vehicles[147] in Slovenia, we can conclude that Slovenia has a ratio of 5.9 electric vehicles per recharging point, which corresponds to the envisaged European framework[148]. The ratio for the entire EU was 14.5 electric vehicles per recharging point and in Sweden, it was 21.1. Figure 163 shows the structure of recharging points in Slovenia by maximum charging power (P), with 14.4% of the recharging points providing fast DC charging and the remaining 85.6% providing AC charging[149]. In the EU, 10.4% of the recharging points are DC charging points and 89.6% are AC charging points.

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

FIGURE 163: STRUCTURE[150] OF THE NUMBER OF RECHARGING POINTS FOR ELECTRIC VEHICLES IN SLOVENIA BY MAXIMUM CHARGING POWER (P)

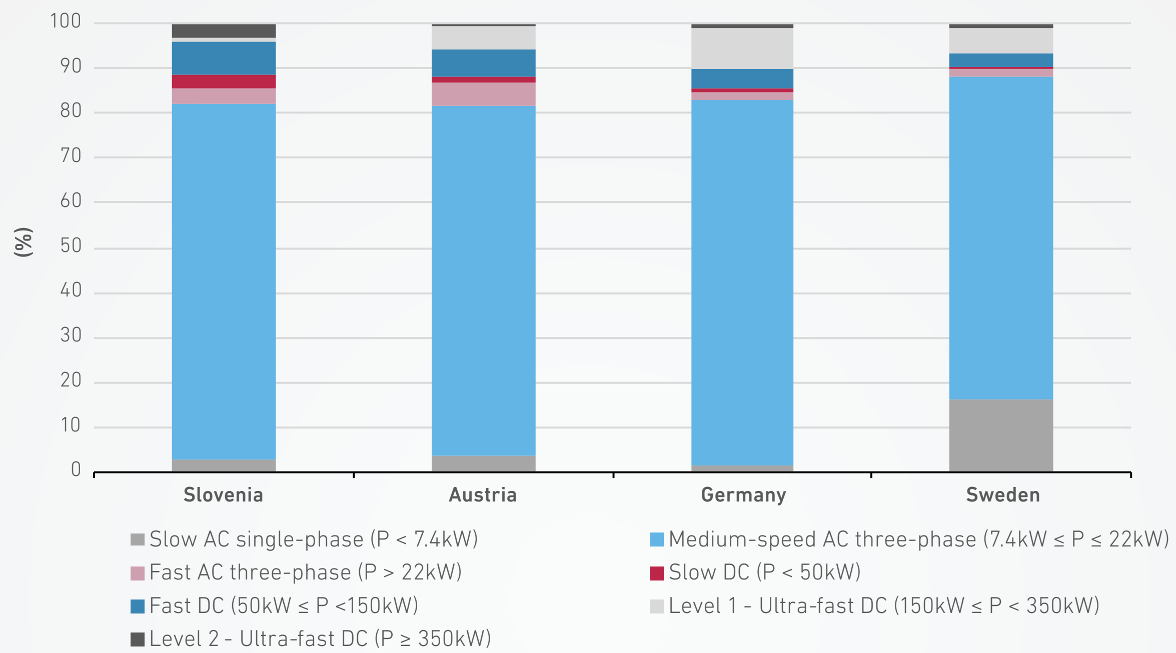


SOURCE: EAFO

143 European Alternative Fuels Observatory
144 Data as of 3 May 2023 (Source: EAFO)
145 The data shows that around 79% of the recharging points are accessible without restrictions (unlimited accessibility 24/7 for all users) and the remaining 21% with some access restrictions, where specific, albeit non-discriminatory, access restrictions apply (such as limited time of use - e.g. recharging points in the car parks of large shops, hotel and catering establishments, etc.).
146 Due to the change in the methodology for counting the number of recharging points for electric vehicles, it is not possible to provide a uniform overview of the evolution of the number of recharging points over the years. Also, the Energy Agency's analytical work in monitoring the development of electromobility in Slovenia in general is hindered by the volatility of the data in the reference databases where it is possible to detect changes of data even for the past.
147 The total number of electric vehicles includes vehicles in all the categories mentioned above (M1, L and N1).
148 As an indication, the appropriate average number of recharging points should be equivalent to at least one recharging point per 10 cars, also taking into consideration the type of cars, charging technology and available private recharging points (Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the deployment of alternative fuels infrastructure).
149 For example, a 22 kW recharging station, at the maximum charging power, can provide an electric vehicle with an average consumption of 14.5 kWh with enough charge in about 40 minutes to cover a distance of 100 km. Larger charging power allows correspondingly shorter charging times.
150 The difference between the total and the sums of the individual shares is due to rounding to one decimal place.

Figure 164 below compares the structure of the recharging points in Slovenia, Austria, Germany and Sweden. The data shows a very similar structure of recharging points in those countries.

FIGURE 164: STRUCTURE OF THE NUMBER OF RECHARGING POINTS FOR ELECTRIC VEHICLES IN VARIOUS COUNTRIES BY MAXIMUM CHARGING POWER (P)



SOURCE: EAFO

The only major difference is the much higher share of slow recharging points (up to 7.4 kW) and normal recharging points[151] (up to and including 22 kW) in Sweden. In Slovenia, the proportion of high-power recharging points[152], which is structurally slightly different but in general comparable to those in Austria and Germany, provides a comparable transfer capacity.

A comparison of the above data with the data from the sector strategy and related documents[153] shows a slower uptake of electromobility in Slovenia, both in the field of electric vehicles and charging infrastructure, which is supposed to keep pace with the development of the use of electric vehicles.

A public consultation regarding the update of the NECP was started in 2022. Its primary focus was on developing proposals for the goals and orientations for updating the document. The presented projections in the area of transport involve a significant increase in the use of electricity in road transport, which depends on the selected combination of measures to improve supply (sustainable mobility) and manage demand (personal motor transport).

151 »Normal recharging point« means a recharging point that allows for the transfer of electricity to an electric vehicle with a power of less than or equal to 22 kW, excluding devices with a power of less than or equal to 3.7 kW that are installed in private households or whose primary purpose is not the charging of electric vehicles and that are not accessible to the public (Decree Establishing the Infrastructure for Alternative Transport Fuels)

152 »High-power recharging point« means a recharging point that allows for the transfer of electricity to an electric vehicle with a power output of more than 22 kW (Decree Establishing the Infrastructure for Alternative Transport Fuels).

153 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 Programme for Alternative Fuels in Transport for 2022 and 2023 (23 December 2021), Report on the Implementation of the Action Programme on Alternative Fuels in Transport in 2021 (6 April 2022)

In 2022, the Ministry of Infrastructure drew up the draft Act on Infrastructure for Alternative Fuels and the Promotion of the Transition to Alternative Fuels in Transport, which provides the legislative framework for the establishment, development, expansion and safe usage of an interoperable and user-friendly charging and supply infrastructure for alternative fuels in road, air and marine traffic and three energy sources, namely electricity, hydrogen and natural gas. The Act represents a transposition into the Slovenian legal order of Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the deployment of an alternative fuels infrastructure and facilitates the intersectoral integration of transport and energy necessary for the comprehensive development of the infrastructure for alternative fuels in transport.

During the time of writing this report, the Act was adopted and entered into force in June 2023.

The proposed Regulation of the European Parliament and of the Council on the deployment of alternative fuels infrastructure, and repealing

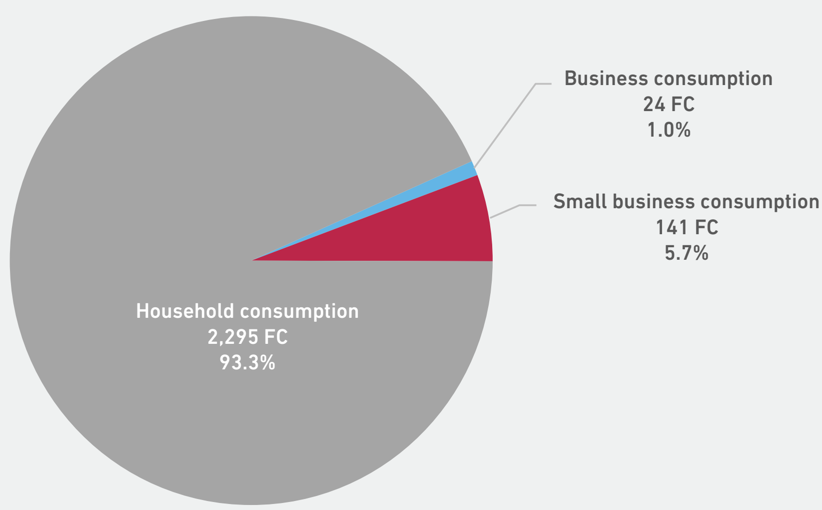
12.8% increase in electricity supply to meet the requirements of electromobility

The Act on Infrastructure for Alternative Fuels and the Promotion of the Transition to Alternative Fuels in Transport, proposed in 2022

Directive 2014/94/EU of the European Parliament and of the Council (AFIR) is part of the bundle of legislative proposals »Fit for 55« and will put in place legally binding national and pan-European goals regarding the establishment of alternative fuel infrastructure (electricity, hydrogen and liquefied methane) for road vehicles. The proposal envisions the establishment of separate recharging pools for light and heavy vehicles and implementing national action plans according to concrete goals and requirements.

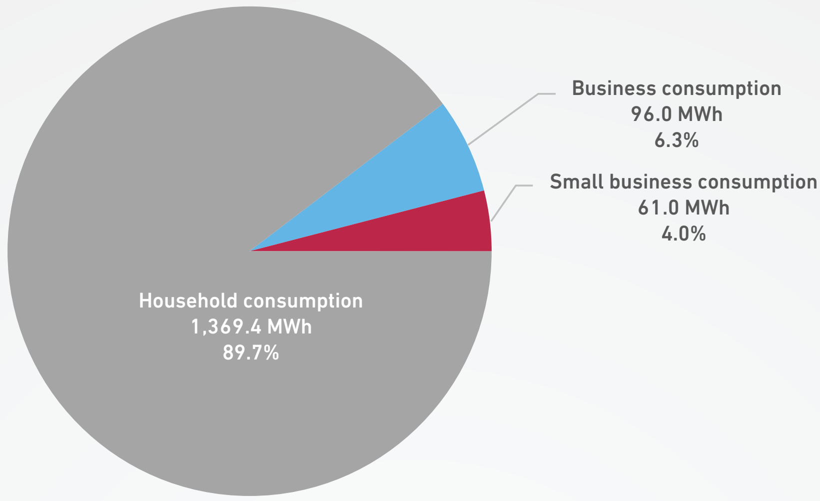
In 2022, seven suppliers were active in the field of the supply of electricity for electromobility – either operating their own charging infrastructure, supplying electricity to charging infrastructure operators, or having an energy supply contract with consumers that requires the ownership or use of an electric vehicle. Supplier data shows that 4.42 GWh of electricity was supplied to cover electromobility needs, which is 0.50 GWh, or 12.8%, more than the year before. The suppliers delivered 1.53 GWh of electricity, or 34.5%, to the final consumers, with the rest used to cover their own charging infrastructure management overhead.

FIGURE 165: THE NUMBER OF FINAL CONSUMERS (FC) WITH AN ELECTRICITY SUPPLY CONTRACT ADAPTED TO THE USE OF ELECTROMOBILITY



SOURCES: SUPPLIERS

FIGURE 166: THE STRUCTURE OF ELECTRICITY SUPPLY FOR THE NEEDS OF ELECTROMOBILITY BY THE TYPE OF FINAL CONSUMER



SOURCES: SUPPLIERS

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 supply is quantified using two basic parameters – sufficiency and security. Sufficiency is an indicator of the system's ability to meet the consumers' demand for electricity and power under all the anticipated operational conditions, i.e. taking into account planned and unplanned outages of the system's elements. Operational security is the system's ability to maintain a normal state or to return to a normal state as quickly as possible, that is, to withstand a set of disturbances in a specific operational condition (e.g. short circuits in the network, outages of the system's elements and unexpected changes in consumption in relation to generation constraints) so that consumers do not feel the consequences of a disturbance, which is eliminated without jeopardising the system's integrity. The entry into force of network codes on system operation, electricity emergencies and restoration laid down detailed rules on how TSOs and other relevant participants have to operate and cooperate to ensure the system's security. The adopted Clean Energy for All Europeans legislative package has set out a common framework of rules on how to prevent and manage electricity crises.

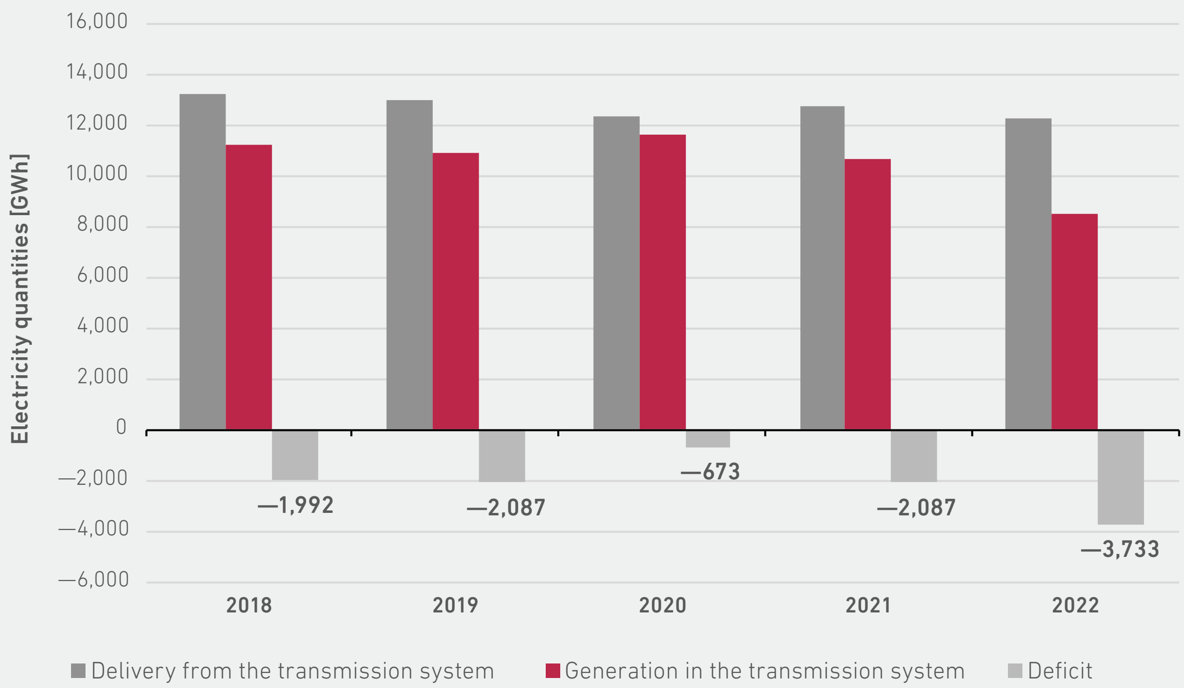
The required level of security of the electricity supply in a country is transparently represented by a reliability standard typically expressed using the Loss of Load Expectation (LOLE) indicator. The reliability standard is defined on the basis of a marginal reduction in the Expected Energy Not Served 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.

Monitoring the Balance Between Generation and Consumption

In 2022, the delivery of electricity from the transmission system decreased by 3.6% compared to the year before. Taking into account half of the capacity of the Krško NPP, electricity generation in the transmission system in 2022 was 19.8% lower than the year before, due to the extremely poor hydrology, the overhaul of the Krško NPP and the temporary shutdown of the Šoštanj TPP to save coal. In 2022, the consumption of electricity from the transmission system covered by domestic production reached its lowest level in 25 years at only 70%.

Record-low consumption of electricity from the transmission system covered by domestic resources

FIGURE 167: ELECTRICITY CONSUMPTION AND GENERATION IN THE SLOVENIAN TRANSMISSION SYSTEM WITHOUT TAKING INTO ACCOUNT LOSSES IN THE 2018–2022 PERIOD



SOURCE: ELES

Monitoring Investment in Production Capacities to Ensure a Reliable Supply

Besides taking into account the anticipated economic developments to estimate future electricity consumption in Slovenia, the requirements of the European Network of Transmission System Operators (ENTSO-E) from the ten-year EU development plan have been considered to the greatest extent possible, along with the scenarios from the NECP.

Electricity demand at the transmission level is mainly covered by sources connected to the transmission system. So, in order to provide a forecast of the situation in the Slovenian electricity system that is as accurate as possible, those planned production sources whose construction is considered less likely should be excluded.

In order 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 on shutdowns of existing production units and divided them into four scenarios according to the likelihood of their implementation. Scenario 1 is the most pessimistic, taking into account only the generation sources that are already under construction or that have obtained planning permission, scenario 2 considers investments in generation units that can be realistically expected while taking into account delays in the construction of new hydropower plants, and scenario 3 envisages the similar realisation of power plant construction as in scenario 2, except that no HPP construction is anticipated beyond the ten-year development period. Most ambitious in terms of the integration of new production units is scenario 4, which foresees the construction of all the investments identified in the NECP, as well as all those announced by investors. Scenario 4 also foresees the construction of the second unit of the Krško NPP in 2030, which is highly unlikely given the current status of that investment. None of the scenarios foresee any HPP being constructed on the Mura River by 2030, and the construction of other hydropower facilities is also highly uncertain due to siting problems and opposition from environmentalists.

All scenarios up to 2030 show a shortfall in domestic generation to cover the consumption of electricity from the transmission system

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

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

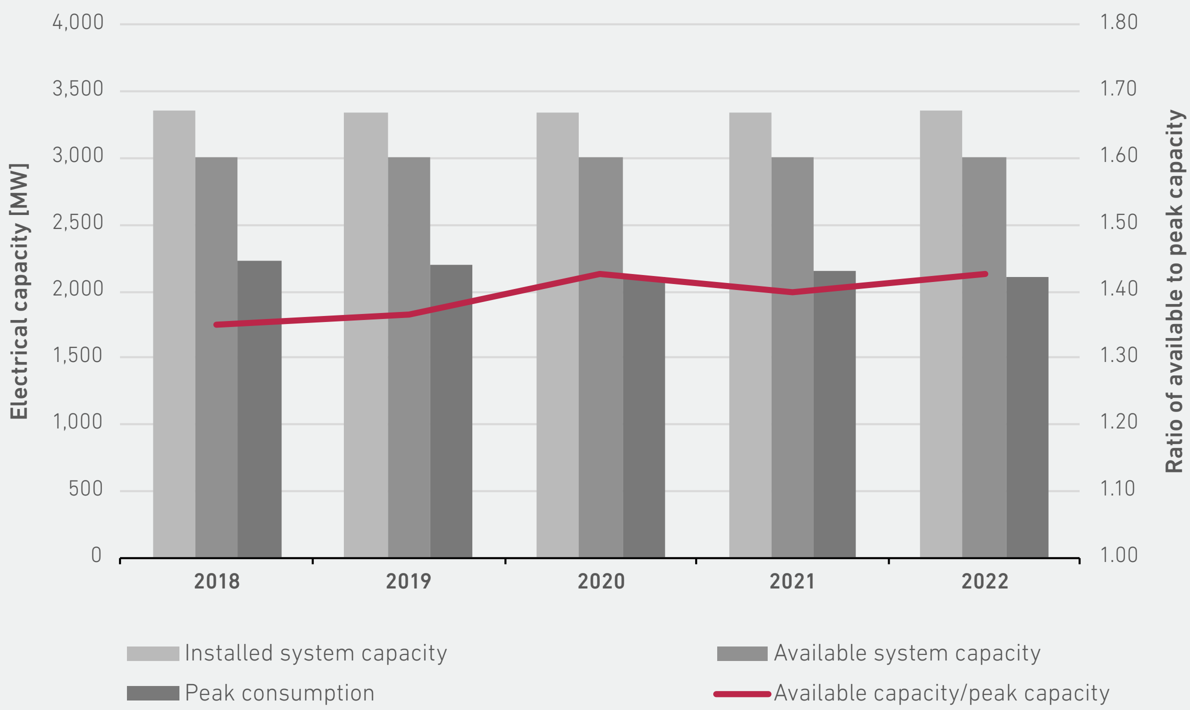
SOURCE: ELES

Measures to Cover Peak Demand and Shortages of Electricity

Coverage of shortages of electricity is based on import via cross-border interconnectors

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. The ratio between the available capacity and peak load in the transmission system in 2022 improved only marginally compared to the previous year, due to a slightly lower demand at peak load, and in October, when the Krško nuclear power plant was shut down for an overhaul and the Šoštanj Thermal Power Plant was not operating due to a lack of coal, the ratio between the available capacity and peak load was even less than 1. Nevertheless, the supply of electricity to final consumers 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 at a relatively favourable price.

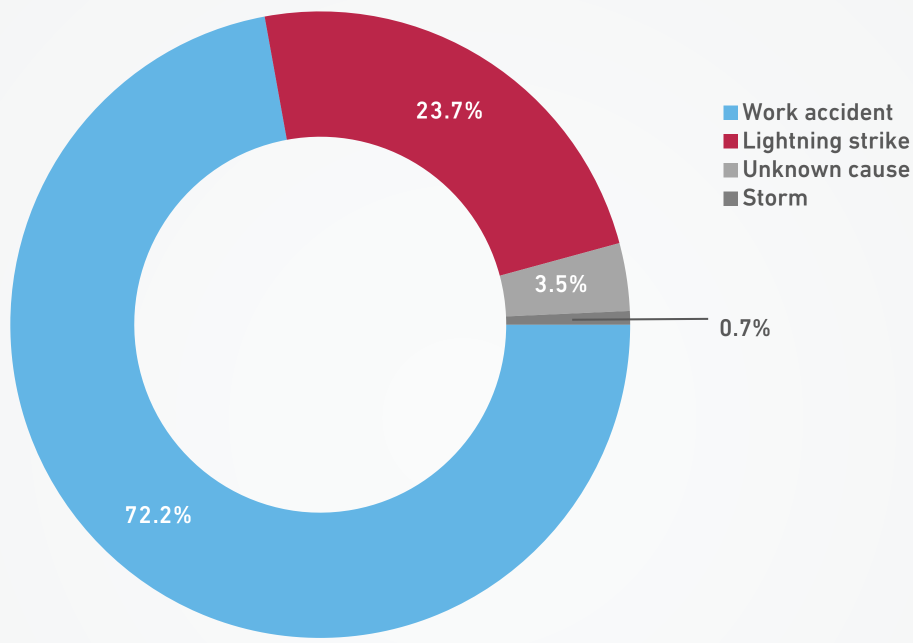
FIGURE 168: INSTALLED CAPACITIES OF PRODUCTION FACILITIES, CAPACITIES AVAILABLE FOR THE SLOVENIAN MARKET AND PEAK DEMAND, AND THE RATIO BETWEEN THE AVAILABLE CAPACITY AND PEAK LOAD IN THE TRANSMISSION SYSTEM IN THE 2018–2022 PERIOD



SOURCE: ELES

Extreme weather or damage to the grid can lead to supply interruptions. Energy not supplied (or Energy not Served) is energy that could potentially be delivered by the system had there not been an interruption of supply. The volume of electricity not supplied from the transmission system in 2022 was 79.6 MWh, almost eight times more than the year before. The largest part, 57.43 MWh, is due to a work accident during the execution of works on the 110-kV coupling field in the Hudo Distribution Station, 18.83 MWh of the energy not supplied is due to lightning strikes, and a smaller part is due to unknown causes and a storm. Electricity that is not supplied is calculated in accordance with the Act on the rules for monitoring the quality of the electricity supply. Therefore, the actual volume of not supplied electricity may be lower than indicated since a significant share of consumers in the affected areas could be oversupplied by the medium-voltage network.

FIGURE 169: ELECTRICITY NOT SUPPLIED FROM THE TRANSMISSION SYSTEM IN 2022 ACCORDING TO CAUSE[154]



SOURCE: ELES

154 Rounding of percentages to one decimal place may result in discrepancies in the totals of the percentages.

NATURAL GAS

GAS SUPPLY UNINTERRUPTED, SLOVENIA IS WELL PREPARED FOR POTENTIAL CRISES

NATURAL GAS CONSUMPTION **11.3%** LOWER THAN IN 2021

12.6% INCREASE IN NATURAL GAS VOLUMES TRANSPORTED DUE TO INCREASED TRANSMISSION TO OTHER TRANSMISSION SYSTEMS

EARLY WARNING LEVEL ANNOUNCED - URGING CONSUMERS TO REDUCE CONSUMPTION AND CONSIDER SWITCHING TO ANOTHER ENERGY SOURCE

36% INCREASE IN TECHNICAL CAPACITY AT THE BORDER WITH ITALY - UPGRADE OF THE ŠEMPETER ENTRY POINT

AGAIN IMPORTS FROM ALGERIA – IN THE NEXT THREE YEARS WILL ACCOUNT FOR ABOUT A THIRD OF SLOVENIAN CONSUMPTION

1587 FEWER NATURAL GAS CUSTOMERS IN DISTRIBUTION SYSTEMS

7.3% REDUCTION IN GAS CONSUMPTION COMPARED TO AVERAGE CONSUMPTION IN THE YEARS FROM 2017 TO 2021

50% FEWER NEW CONNECTIONS TO DISTRIBUTION SYSTEMS THAN IN 2021

The cleanest fossil fuel

€9.9 MILLION

INVESTMENT IN DISTRIBUTION SYSTEMS – 3% LESS THAN THE PREVIOUS YEAR

41% YEAR-ON-YEAR INCREASE

IN THE AVERAGE PRICE OF NATURAL GAS ON THE RETAIL MARKET

€23.5 MILLION

INVESTMENT IN TRANSMISSION SYSTEMS - TWICE AS MUCH AS THE PREVIOUS YEAR

4 SUPPLIERS

EXITED THE RETAIL MARKET

DISTRIBUTION NETWORK CHARGES FOR MOST CONSUMERS REMAINED AT THE LEVEL OF THE **PREVIOUS TWO YEARS**

3% ABOVE AVERAGE

THE FINAL GAS PRICE FOR BUSINESS CONSUMERS WAS 3 % ABOVE AVERAGE

68% LOWER

LNG CONSUMPTION

BELOW THE EU-27 AVERAGE

THE FINAL PRICE OF NATURAL GAS FOR A TYPICAL HOUSEHOLD CONSUMER REMAINED BELOW THE EU-27 AVERAGE

173% INCREASE IN SWITCHING

BY BUSINESS CONSUMERS OF NATURAL GAS

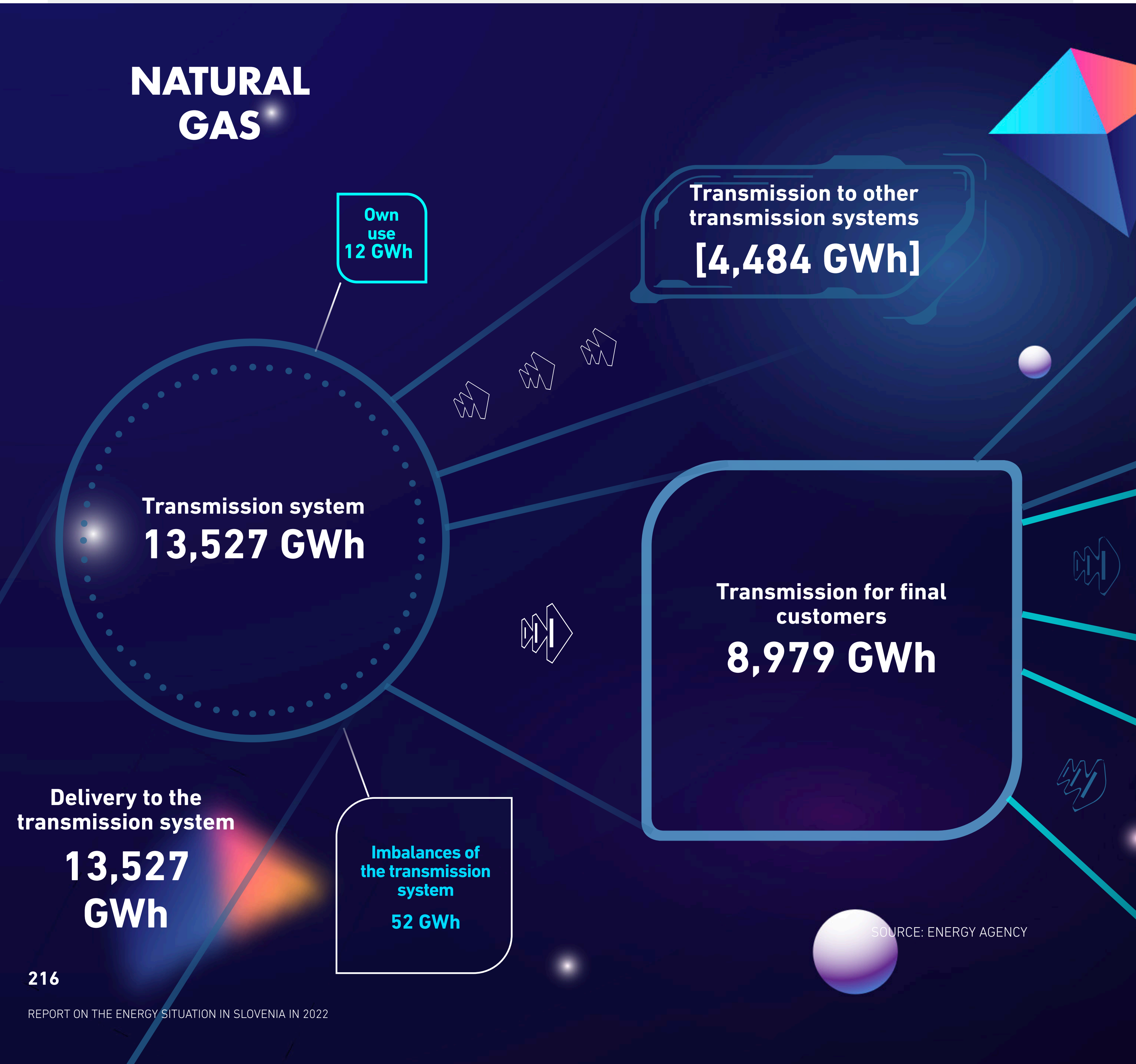
286% INCREASE IN SWITCHING

BY HOUSEHOLD CONSUMERS OF NATURAL GAS

NATURAL GAS

The Supply of and Demand for Natural Gas

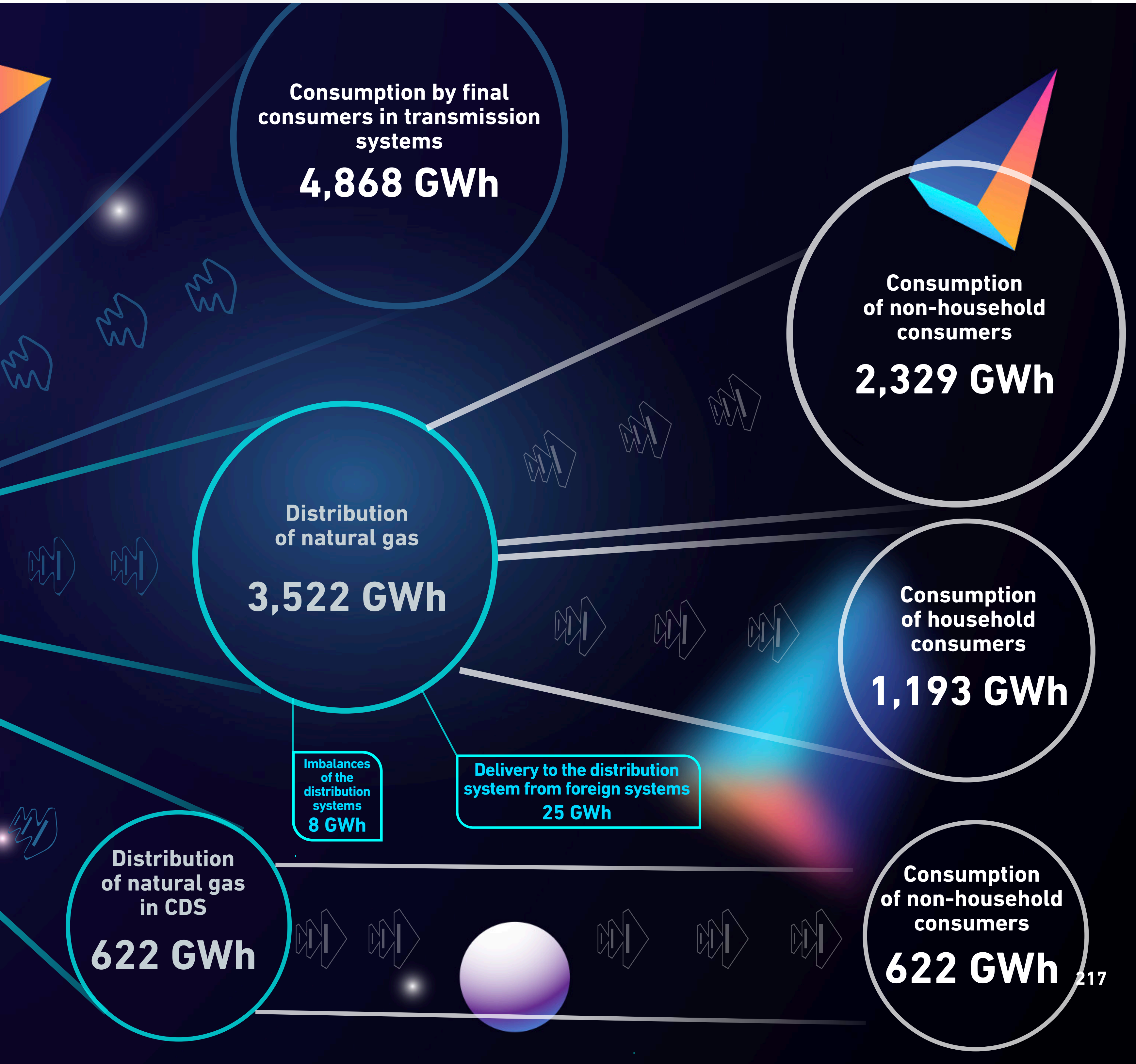
In 2022, 13,527 GWh of natural gas was transported through the natural gas transmission system, which is an increase of almost 13% compared to the previous year. The increase in transmission volumes is due to higher transmission volumes to neighbouring transmission systems, while transmission for the needs of domestic consumers decreased compared to the previous year. 8,979



GWh or 11.3% less than the previous year were transferred to supply domestic customers, while 4,484 GWh of natural gas were transferred to other transmission systems. The difference of 64 GWh is due to imbalances and own use of the transmission system. Transmission to other transmission systems increased by a good 145% compared to the previous year, but this was still 46.5% below the average of the last decade.

A 12.6% increase in natural gas quantities transported due to increased transmission to other transmission systems

FIGURE 170: BASIC DATA ON THE QUANTITIES OF NATURAL GAS TRANSFERRED, DISTRIBUTED AND CONSUMED



The total consumption by natural gas consumers was 9012 GWh and was 1,151 GWh or 11.3% lower than the previous year. In 2022, the consumption of gas was almost 10% above the consumption in 2014, which represents the lowest value of annual consumption since 2020. Consumption decreased in all consumer groups. Household and non-household consumers connected to the distribution systems together used almost 12% less natural gas. Household consumers consumed around 9% less gas, and non-household consumers almost 13% less gas than the year before. Compared to the previous year, non-household consumers in the transmission system and closed distribution systems (CDS) also consumed less gas than the year before.

11.3% lower consumption of natural gas

In the transmission system, the consumption was lower by almost 12%. Consumers supplied by CDSs consumed a good 4% less natural gas than in 2021. Data on the transmission and consumption of natural gas consumers according to the type of consumption in the years from 2018 to 2022 are shown in Table 33.

TABLE 33: TOTAL TRANSFERRED QUANTITIES OF NATURAL GAS AND CONSUMPTION BY NATURAL GAS CONSUMERS ACCORDING TO THE TYPE OF CONSUMPTION DURING THE 2018–2022 PERIOD

Total consumption of natural gas	2018	2019	2020	2021	2022
Delivery to the transmission system [GWh]	13,246	15,985	16,783	12,015	13,527
Transmission to other transmission systems [GWh]	3,798	6,320	7,137	1,829	4,484
Consumption by business consumers in the transmission system [GWh]	5,315	5,478	5,382	5,527	4,868
Consumption by business consumers on CDSs [GWh]	636	619	581	650	622
Consumption by business consumers [GWh]	2,367	2,421	2,446	2,673	2,329
Consumption by household consumers [GWh]	1,156	1,134	1,175	1,313	1,193

SOURCE: ENERGY AGENCY

The total number of active consumption points decreased in comparison to the previous year – the biggest decrease in the last twenty-year period. The number of consumers decreased for the first time in 2008, for the second time in 2016, and for the third time in 2022. At the end of the year, there were 1,588 fewer active consumption points in distribution and closed distribution systems, which is 1.2% less than the year before. At the end of the year, there were three active consumption points in the transmission system, more than the year before. The number of exit points for the supply of distribution systems also increased by two. The change in the number of active consumption points and exit points is partly the result of the reconstruction of the gas pipeline in Jesenice and new connections. The data on the number of active consumers in the transmission system differ from the data provided in the reports for previous years, because the annual reports before 2022 only included data on the number of legal entities that were business customers in the transmission system, but not data on the number of active consumption points, as the same legal entity can be connected to the transmission system at several consumption points. The decrease in the total number of active consumption points is primarily due to numerous disconnections due to the significantly higher natural gas prices for most consumers, which, combined with weather factors and the required voluntary reduction of natural gas consumption by 15% in the period from 1 August 2022 to 31 March 2023, caused the lower annual consumption.

At the end of 2022, 135,619 final consumers were connected to the natural gas transmission system, distribution systems and CDSs. Natural gas distribution was carried out by 13 distribution system operators and five operators of CDS.

TABLE 34: NUMBER OF CONSUMERS ACCORDING TO CONSUMPTION TYPE IN 2021 IN 2022

Number of consumers according to consumption type	2021	2022	Indeks
Business consumers connected to the transmission system[155]	155	158	101.94
Business consumers connected to the distribution systems	14,600	14,369	98.42
Business consumers in CDSs	49	48	97.96
Household consumers	122,400	121,044	98.89
Total	**137,204**	**135,619**	98.84

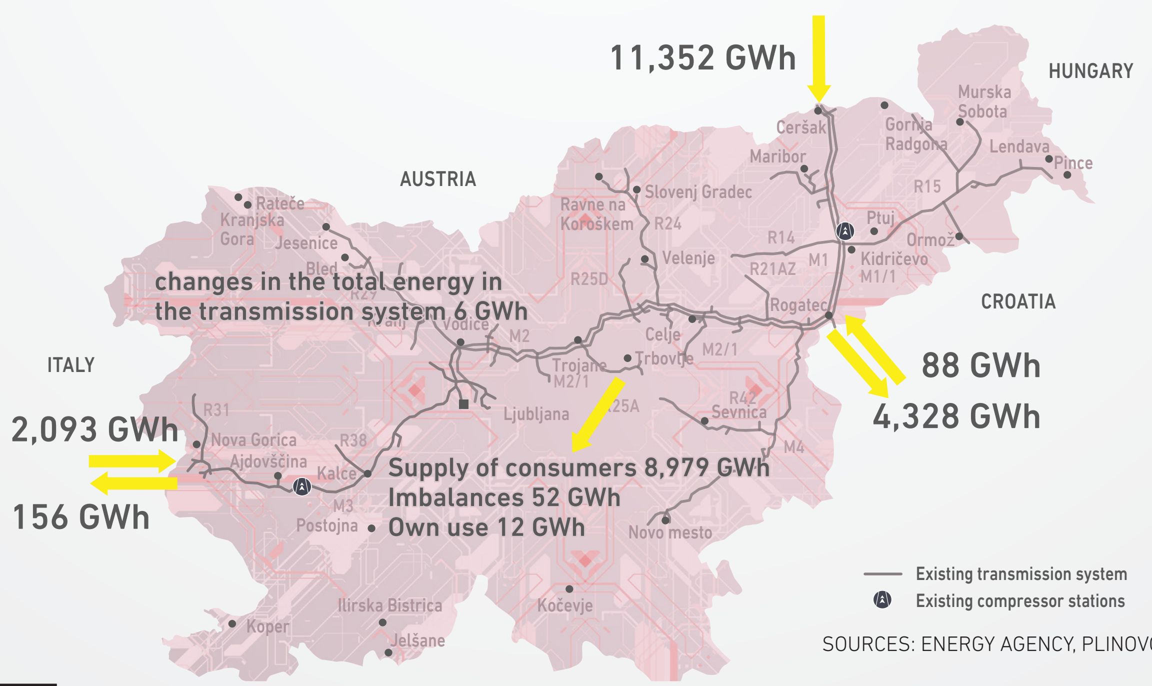
SOURCE: ENERGY AGENCY

Transmission of Natural Gas

The transmission system is owned and operated by the transmission system operator, Plinovodi. It consists of 1,200 kilometres of high-pressure pipelines with a nominal pressure above 16 bar and 211 kilometres of other pipelines, of which 989 kilometres are high-pressure pipelines with a nominal pressure above 16 bar, and 211 kilometres are pipelines with a nominal pressure below 16 bar. The transmission network also consists of 212 metering/regulating stations (MRS), 45 metering stations (MP), eight reduction stations and compressor stations in Kidričevo and Ajdovščina. The transmission network is connected to the natural gas transmission networks of Austria (MRS Ceršak), Italy (MRS Šempeter pri Gorici) and Croatia (MRS Rogatec). At the border crossing points with Italy and Croatia, the two-way transmission of natural gas is possible, while at the border crossing point with Austria, gas only flows into Slovenia. The border points are also relevant points in the transmission system. The sixth relevant point is the exit point in the Republic of Slovenia. Trading in natural gas on the wholesale market takes place at a virtual point.

No production source of natural gas, biomethane or synthetic methane was connected to the transmission system in 2022. Also, no hydrogen was mixed into the transmission system.

FIGURE 171: NATURAL GAS TRANSMISSION SYSTEM AND TRANSFERRED QUANTITIES OF GAS AT THE ENTRY AND EXIT POINTS



SOURCES: ENERGY AGENCY, PLINOVODI

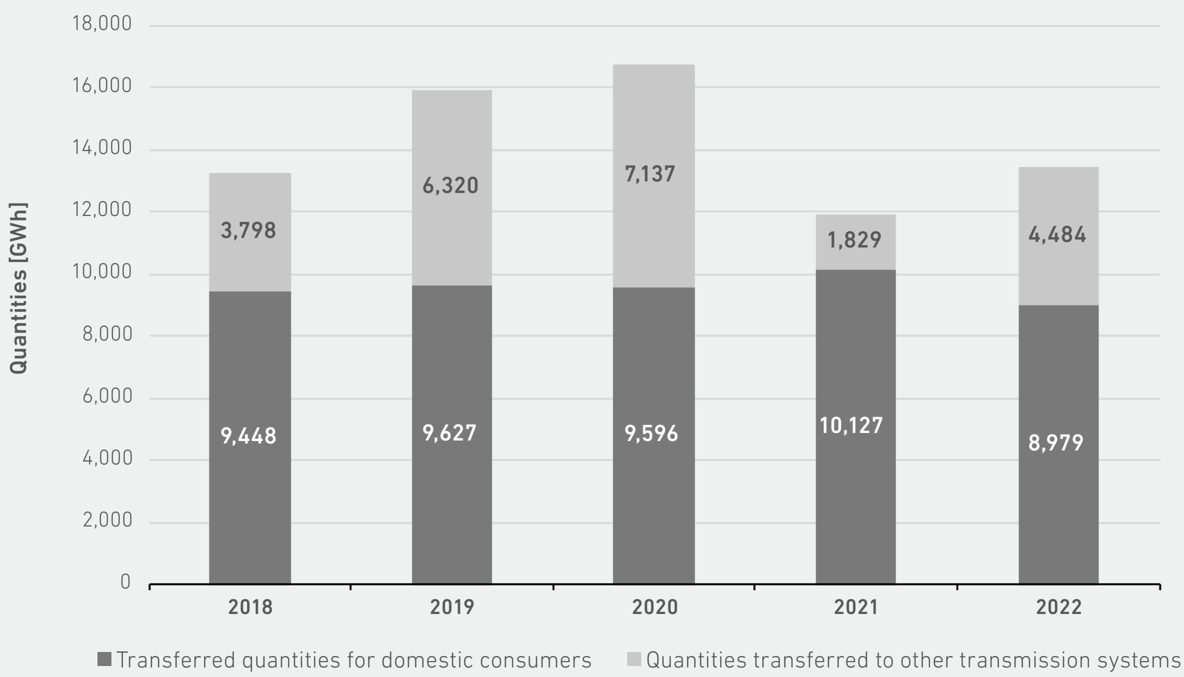
155 The number of business consumers in the transmission system in 2022 differs from the data in last year's report, because in previous reports, the number of legal entities in the role of consumers was indicated, while this year, the total number of consumption points is indicated according to the rule »one consumption location = one customer«.

In 2022, the consumption of Slovenian natural gas consumers was a good 11% lower than the year before. Following record-low quantities transferred to other transmission systems in 2021, gas transmission via Slovenia in 2022 was 2.5 times larger. Compared to 2016, when Croatia was supplied with larger quantities of gas via Slovenia, only a third of these quantities were transferred via Slovenia to Croatia in 2022.

A 7.3% decrease in consumption compared to the average consumption in the years from 2017 to 2021

45 times more gas transferred from Italy

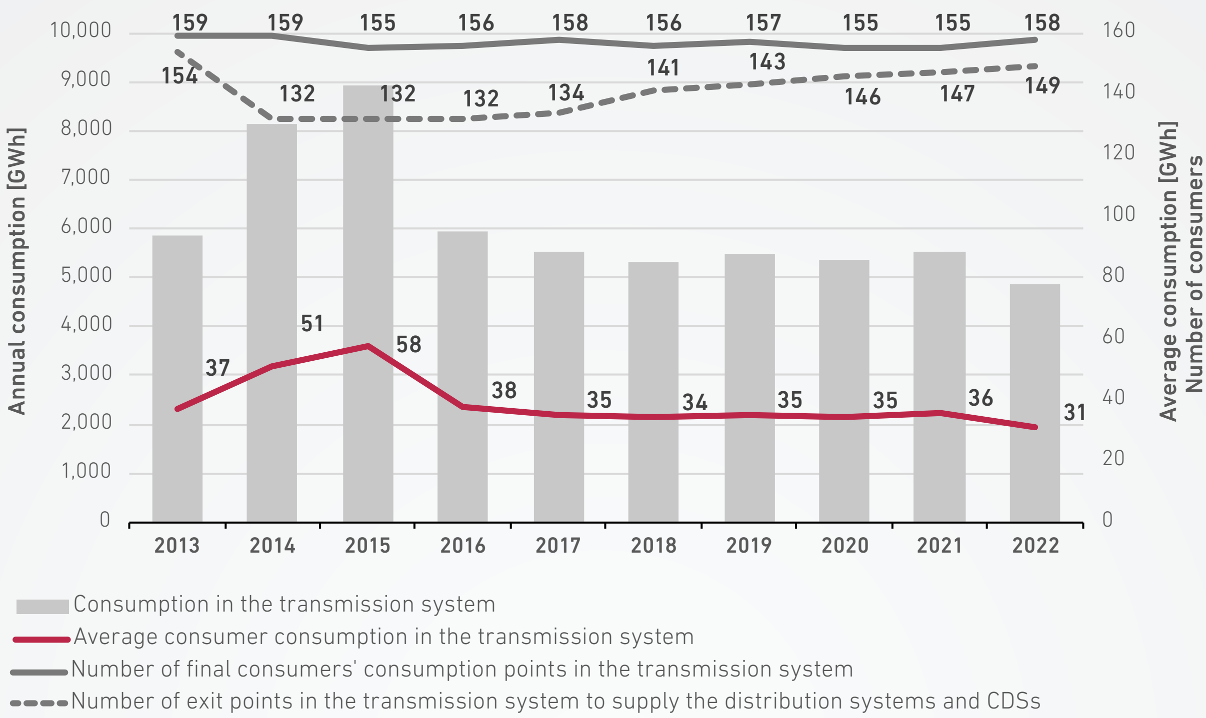
FIGURE 172: QUANTITIES OF NATURAL GAS TRANSFERRED IN THE 2018–2022 PERIOD



SOURCES: ENERGY AGENCY, PLINOVODI

Despite the difficult conditions in the natural gas market, three new final consumer consumption points were connected to the transmission system. The number of them thus amounted to 158.

FIGURE 173: THE TOTAL AND AVERAGE CONSUMPTION OF THE FINAL CONSUMERS IN THE TRANSMISSION SYSTEM AND THE NUMBER OF CONSUMPTION POINTS OF FINAL CONSUMERS AND OPERATORS OF DISTRIBUTION AND CLOSED DISTRIBUTION SYSTEMS IN THE NATURAL GAS TRANSMISSION SYSTEM IN THE 2013–2022 PERIOD

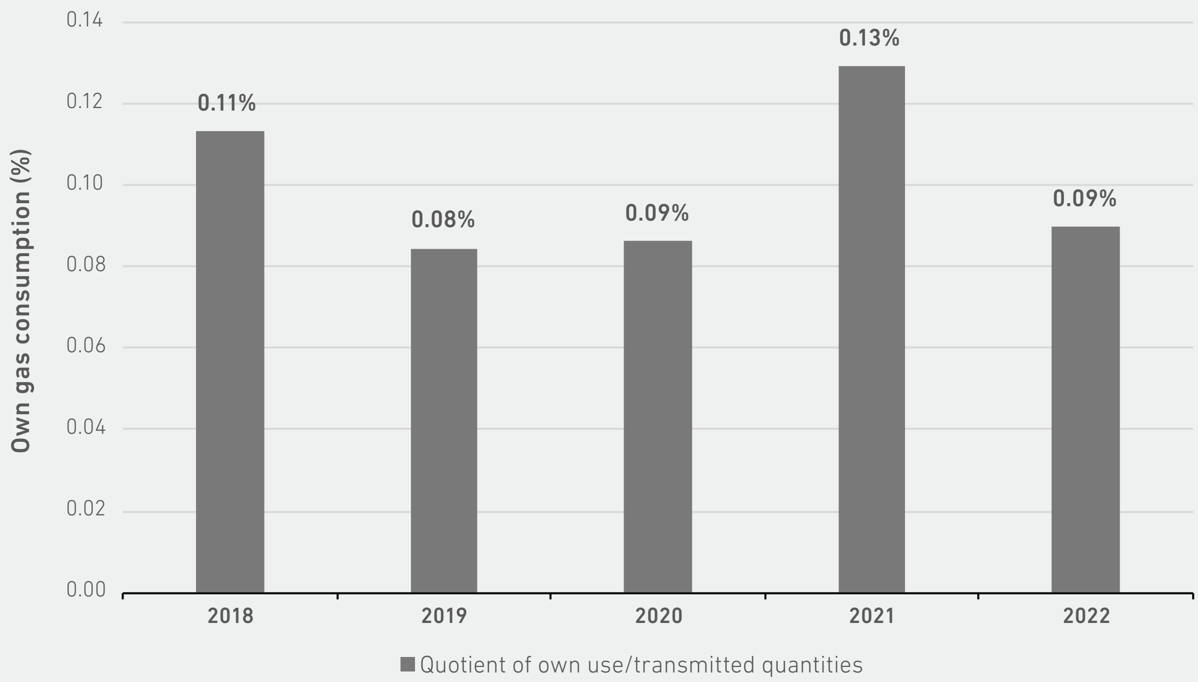


SOURCES: ENERGY AGENCY, PLINOVODI

Own consumption of gas, which is required to drive compressors and heat gas in the metering-regulation stations, amounted to 12.1 GWh, which is 21.7% less than the previous year. The specific consumption of gas for own use, expressed as a quotient between the quantities of gas consumed for own use and the quantities of gas transferred at the border entry points, thus equalled the values from two years ago.

Own consumption of gas over a five-year period averages 0.1% of the transferred quantities

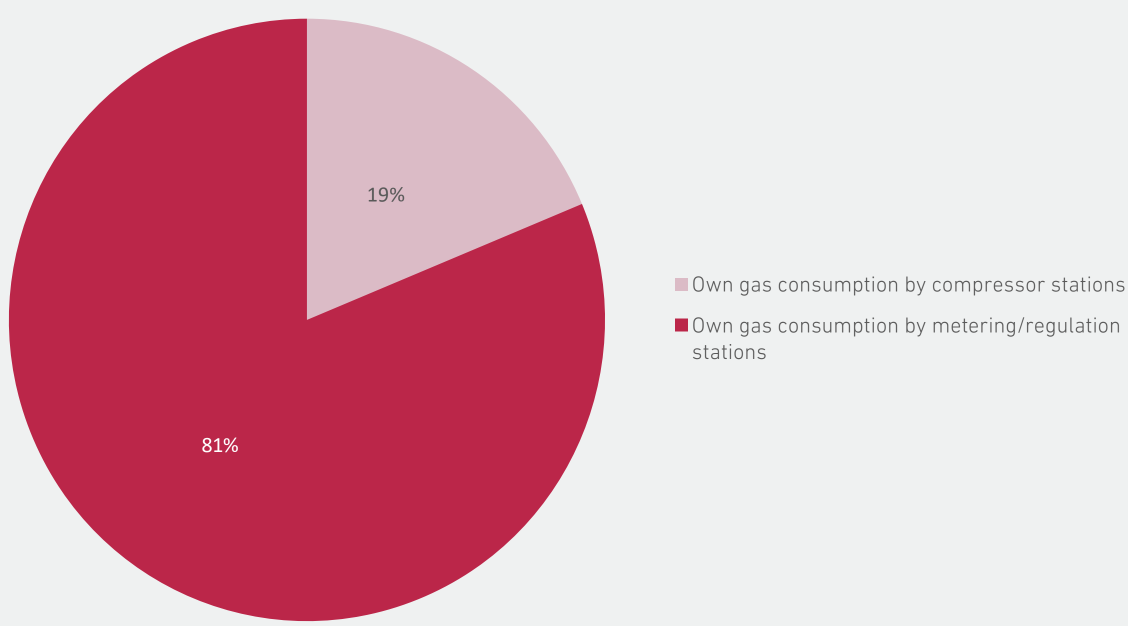
FIGURE 174: OWN GAS CONSUMPTION, CALCULATED BASED ON TRANSFERRED GAS QUANTITIES IN THE 2018–2022 PERIOD



SOURCES: ENERGY AGENCY, PLINOVODI

The own gas consumption by the metering-regulation stations was 4.3 times higher than the own gas consumption by the compressor stations.

FIGURE 175: THE RATIO BETWEEN THE OWN USE OF GAS IN THE COMPRESSOR STATIONS AND IN THE METERING AND REGULATION STATIONS IN 2022



SOURCES: ENERGY AGENCY, PLINOVODI

Distribution of Natural Gas

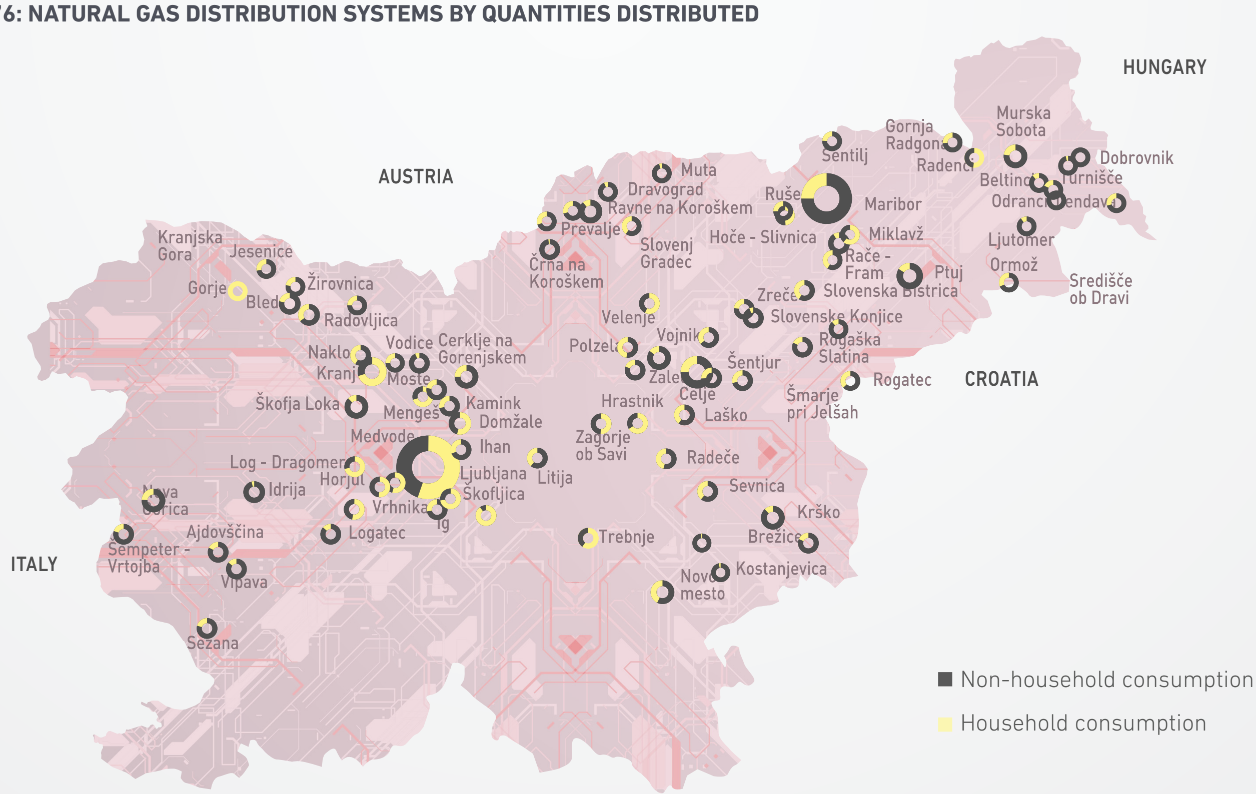
The distribution of natural gas is carried out as an optional local service of general economic interest of the distribution system operator to supply general consumption consumers in urban areas and settlements and as distribution to industrial and business consumers in the CDS areas.

The content and data below, if it is not explicitly stated that they refer to the CDSs, describe the distribution areas with an organised optional local service. All the distribution and closed distribution system operators carried out distribution without interruptions and, subject to safeguards, provided a safe and reliable supply to final consumers. In 2022, natural gas distribution as a local service was provided in 86 municipalities in most of the urban areas of Slovenia, with the exception of the Primorska Region.

As of October, natural gas distribution started in the municipality of Črenšovci. In 2022, the distribution of natural gas was carried out by 13 DSOs. In 71 municipalities, this activity is organised through a concession relationship between the concession holder and the local community, in 14 it is carried out by public undertakings, and in one municipality the local service of general economic interest is implemented in the form of a public capital investment in the activity of private law entities. In the municipalities of Šenčur and Hrastnik, two distribution system operators performed the GJS activity on the basis of concession contracts concluded with the municipality. In some municipalities with an existing concession for natural gas distribution activities, the supply has not yet been made possible because the distribution network has not yet been built or put into operation or because connection to the transmission system is not yet possible.

Natural gas distribution in the form of a local service of general economic interest was carried out in 2022 by 13 operators of distribution systems in the area of 86 municipalities, newly introduced in the municipality of Črenšovci

FIGURE 176: NATURAL GAS DISTRIBUTION SYSTEMS BY QUANTITIES DISTRIBUTED



SOURCES: ENERGY AGENCY, DSOs

Distribution system operators in 2022 distributed 3,522 GWh of natural gas, which is almost 11% less than the year before and 3.3% less than the average of the five-year period of 2017–2021.

Consumers connected to the distribution systems consumed 3,522 GWh of natural gas, 11.6% less than in 2021 or 3.3% less than the average of the previous five years

The decrease in the distributed quantities was primarily the result of a decline in the number of consumers, the very high gas prices, the request for a voluntary reduction in consumption in the period from 1 August 2022 to 31 March 2023, as well as a milder winter. According to the operators, consumption by household consumers decreased by more than 9% in 2022, while non-household consumers used almost 13% less than the year before. The number of household and non-household consumers decreased. There were 1,356 household consumers, or 1.1% less than the year before, and 231 or 1.6% fewer non-household customers. At the end of 2022, 121,044 household and 14,369 non-household consumers were registered.

1,587 fewer consumers in the distribution systems

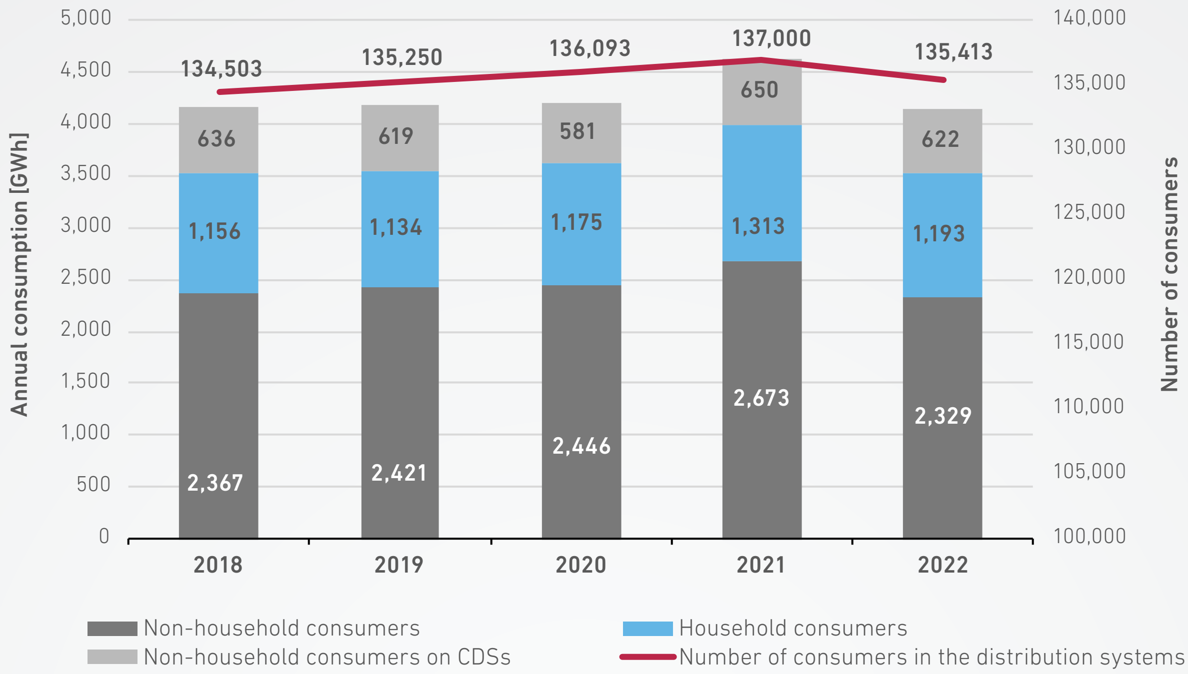
The largest drop in the number of consumers was recorded in consumer groups from C_{DK1} to C_{DK3}, which annually consume up to 15,000 kWh of natural gas. Due to their lower consumption, these consumers are often the most flexible when switching to another energy source. In the case of larger consumers, the transition to another energy source can be more challenging, because it involves larger investments that require more demanding planning and thus more time for changes, while deadlines for the delivery of replacement technologies are generally longer and the installation is conditional on the availability of potential technology suppliers and work contractors.

At the end of 2022, 48 consumers were registered in the areas of the five CDSs, in Jesenice, Kranj, Kidričevo, Štore and Anhovo, one less compared to the previous year. In these closed distribution areas, natural gas distribution is not carried out as a local service of general economic interest. Access to the CDS is only provided to customers within the rounded geographical area of these systems. CDS operators distributed 622 GWh of natural gas in these areas. Compared to 2021, consumption was 4.3% lower.

Figure 177 shows the consumption of household and non-household consumers in distribution systems and CDSs and their number by the type of consumer and system for a period of five years.

4.3% less natural gas used in CDS areas

FIGURE 177: CONSUMPTION BY CONSUMERS IN THE DISTRIBUTION SYSTEM AND CDSs BY THE TYPE OF CONSUMERS AND THE NUMBER OF ACTIVE CONSUMERS IN THE 2018–2022 PERIOD

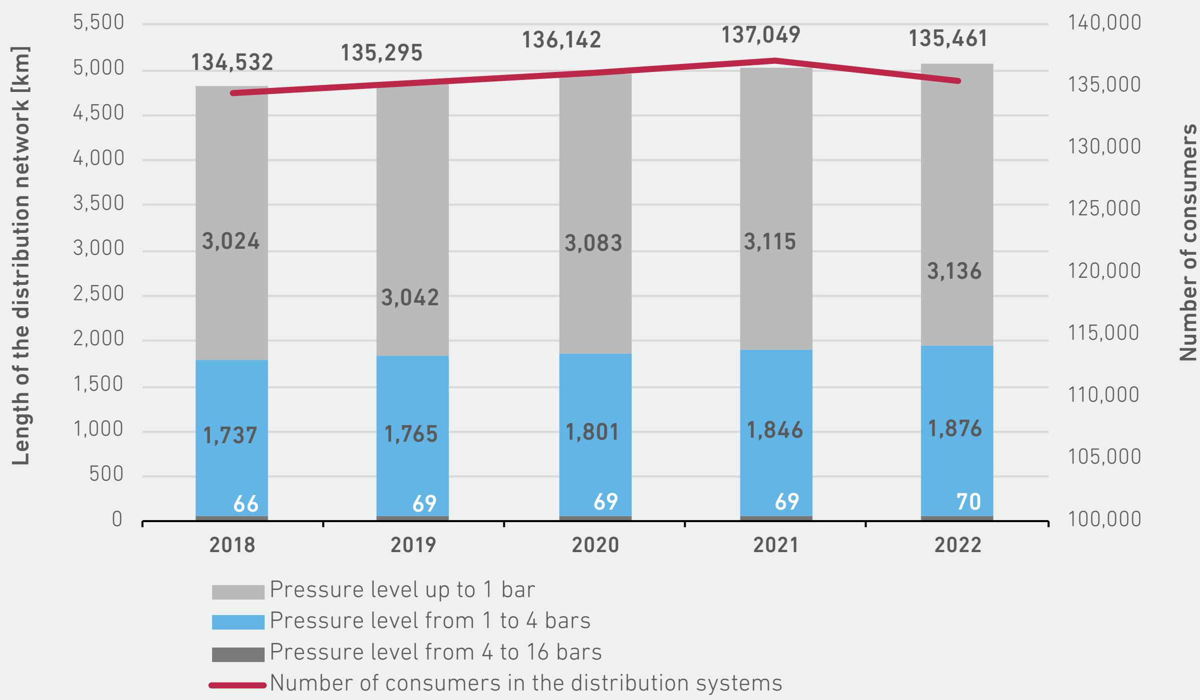


SOURCES: ENERGY AGENCY, DSOs

At the end of 2022, the total recorded length of active lines in the distribution systems and CDSs was 5,082 kilometres, an increase of one percent compared to the previous year. Distribution lines and associated infrastructure are mainly owned by the DSOs. In the five CDS areas, 16.3 kilometres of activated pipelines were recorded, including 8.5 kilometres of pipelines with a pressure level of 4 to 16 bar, about 5.6 kilometres with a pressure level of 1 to 4 bar, and 2.2 kilometres with a pressure level of up to 1 bar. Over the last five years, the distribution network has been extended by an average of 1.4% per year, and by one percent in the last year.

The length breakdown of the distribution systems and CDSs, pressure levels, extensions of pipelines together with connections and the growth in the number of consumers in the 2018–2022 period are shown in Figure 178.

FIGURE 178: LENGTH OF THE DISTRIBUTION NETWORKS AND CDSs, AND THE NUMBER OF ACTIVE CONSUMERS IN THE 2018–2022 PERIOD



SOURCES: ENERGY AGENCY, DSOs

The operators of the natural gas distribution systems newly connected 1,021 customers to the distribution networks, which represents the lowest value in the last decade. The number of new connections decreased by 50% compared to the previous year. The average value of growth in the number of active consumption points over the ten-year period amounted to about half a percent, and a major decline in the number of consumers was recorded in 2022 for the first time. Taking into account new connections and simultaneous disconnections, the total number of consumers connected to the distribution systems decreased by 1,587. At the end of 2022, 135,413 final consumers were connected to the distribution systems. From the collected data, it follows that in 2022, the number of disconnections from the network was 2,608.

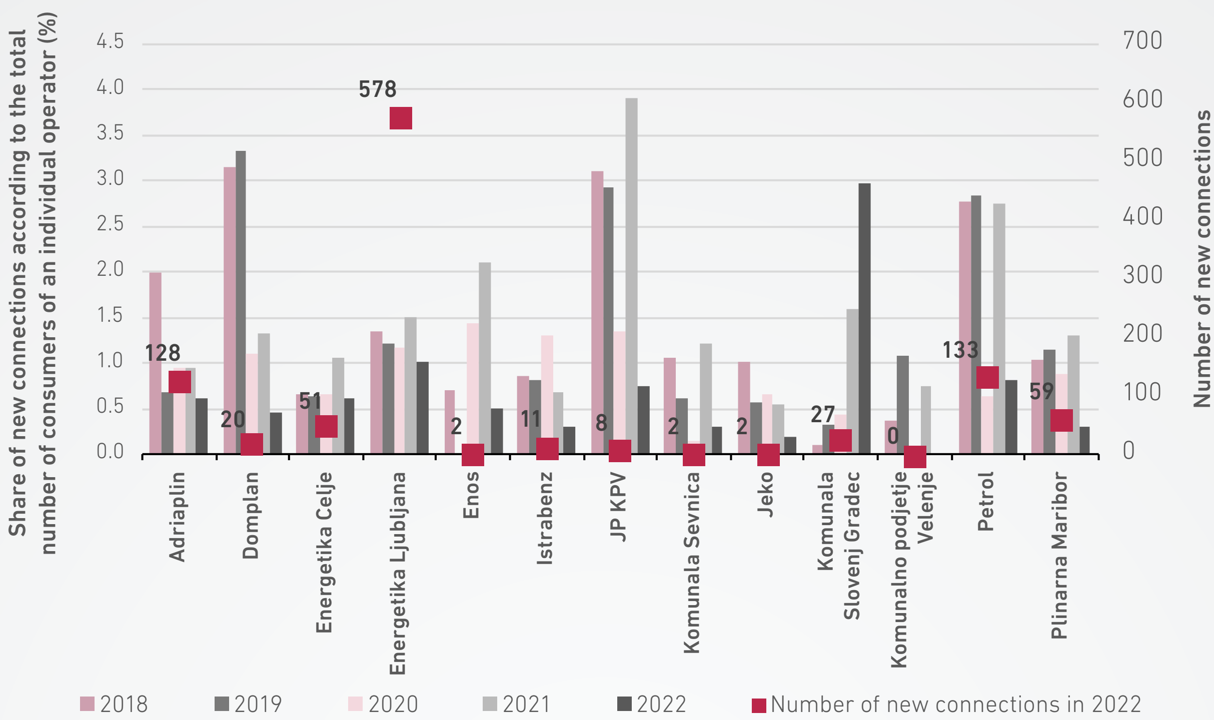
One of the main reasons for the larger decline in the number of consumers was very likely the record high prices of natural gas and the resulting high costs of supply for certain groups of consumers in the period until September 1, 2022. After that date, individual groups of consumers were guaranteed supply at the highest permitted retail price, but this was also incomparably higher than the average prices in the last ten years. Many consumers, especially at consumption points for the supply of shared boiler rooms, also had considerable difficulty in concluding new contracts for the supply of gas after the current contracts expired.

The number of consumers decreased in 57 local communities out of a total of 86. In individual municipalities, the decrease was relatively high compared to the total number of active customer locations. In the municipality of Velenje, which has one of the smaller distribution systems, the number of customers decreased by as much as 20%. The problem of the high prices for the supply of natural gas began to show itself as early as October or November 2021, when new supply contracts had to be concluded for individual joint boiler rooms, and the new prices were completely incomparable to those from before.

Figure 179 shows the share of new connections in relation to the total number of consumers with an individual operator and the number of new connections to the distribution systems of an individual operator. No new connections were recorded to CDSs in 2022.

50% fewer new connections to distribution systems than in 2021

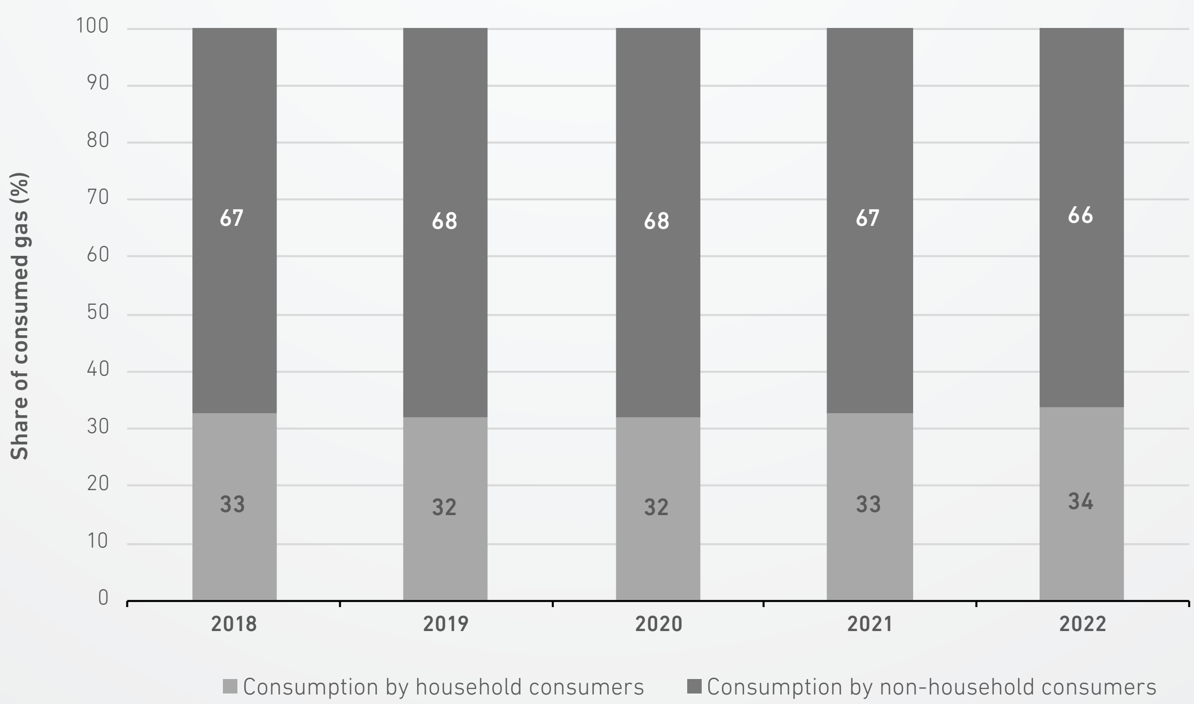
FIGURE 179: SHARE AND NUMBER OF NEW CONSUMERS IN THE DISTRIBUTION SYSTEMS IN THE 2018–2022 PERIOD



SOURCES: ENERGY AGENCY, DSOs

The structure of customers remains unchanged. Household consumers accounted for almost 90% of all customers in the distribution systems. The data on the distributed quantities of natural gas in 2022 compared to previous years does not show any significant changes in the ratios of the shares of household and non-household consumers.

FIGURE 180: SHARE OF CONSUMED NATURAL GAS FROM THE DISTRIBUTION SYSTEMS BY HOUSEHOLD AND NON-HOUSEHOLD CONSUMERS IN THE 2018–2022 PERIOD



SOURCES: ENERGY AGENCY, DSOs

A good 89% of consumers in the distribution systems used less than 25,000 kWh of natural gas per year at the point of consumption.

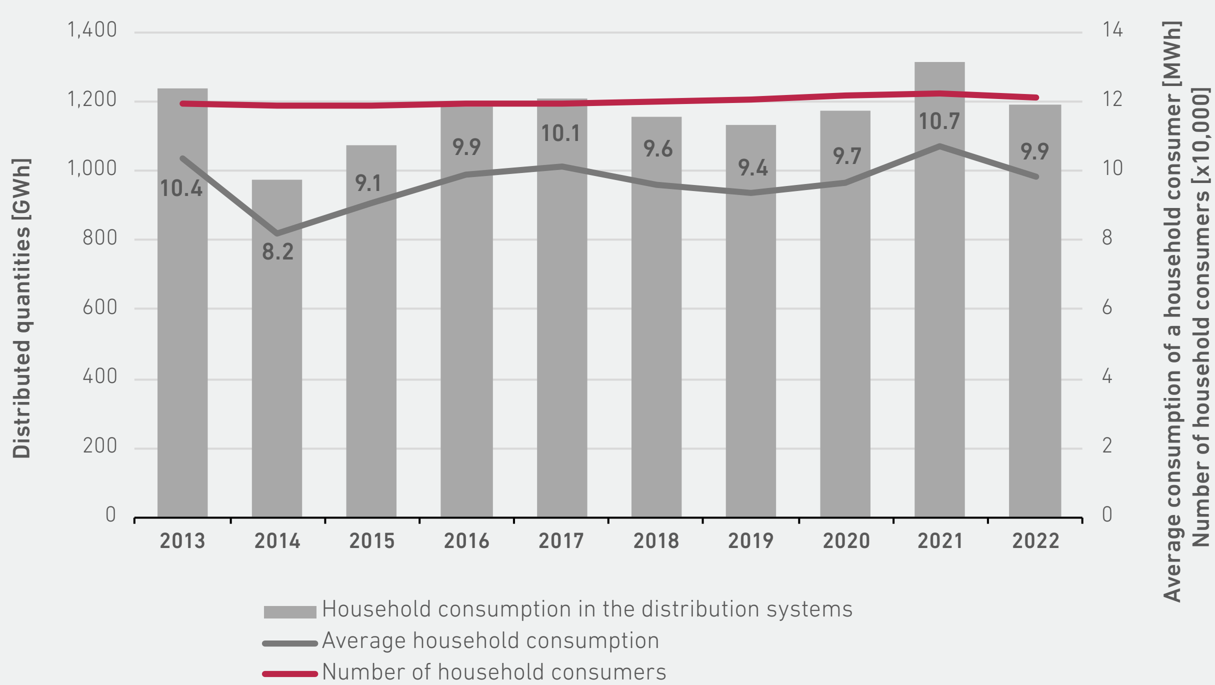
The share of consumers with an annual consumption of natural gas above 50,000 kWh amounted to 3.9% of all consumers, and their consumption means just under 69% of the total consumption of all consumers connected to distribution networks.

Household consumers mainly use natural gas for space heating and hot water, and to a lesser extent for cooking. Among household consumers, almost 94% consumed up to 25,000 kWh per year, and 99.3% consumed less than 50,000 kWh. The total share of consumption by household consumers with an annual consumption of up to 25,000 kWh amounted to 64.1%, and those with a consumption of up to 50,000 kWh amounted to 79% of all household consumption. Household consumption also includes the consumption points of shared boiler rooms owned by residents, where natural gas is used for the central heating of multi-apartment buildings and the preparation of domestic hot water. In 2022, the total consumption of consumption points by household customers with an annual consumption of over 50,000 kWh (common boiler rooms owned by residents) was 21% of the total consumption by household consumers. The values deviate slightly from the previous period, which is mainly the result of the reclassification of individual consumption points for the needs of supplying the common boiler rooms of multi-apartment buildings from non-household consumption to household consumption.

The average annual consumption of household customers decreased by more than 8%, with the main reason for the decrease being the high gas prices, requirements for voluntary reductions in gas consumption and a milder winter. Figure 181 shows the total and average consumption of natural gas by household consumers and the number of such consumers in each year of the 2013–2022 period.

The average consumption of household consumers is lower by more than 8%

FIGURE 181: TOTAL AND AVERAGE CONSUMPTION OF HOUSEHOLD CONSUMERS IN THE DISTRIBUTION SYSTEMS IN THE 2013–2022 PERIOD

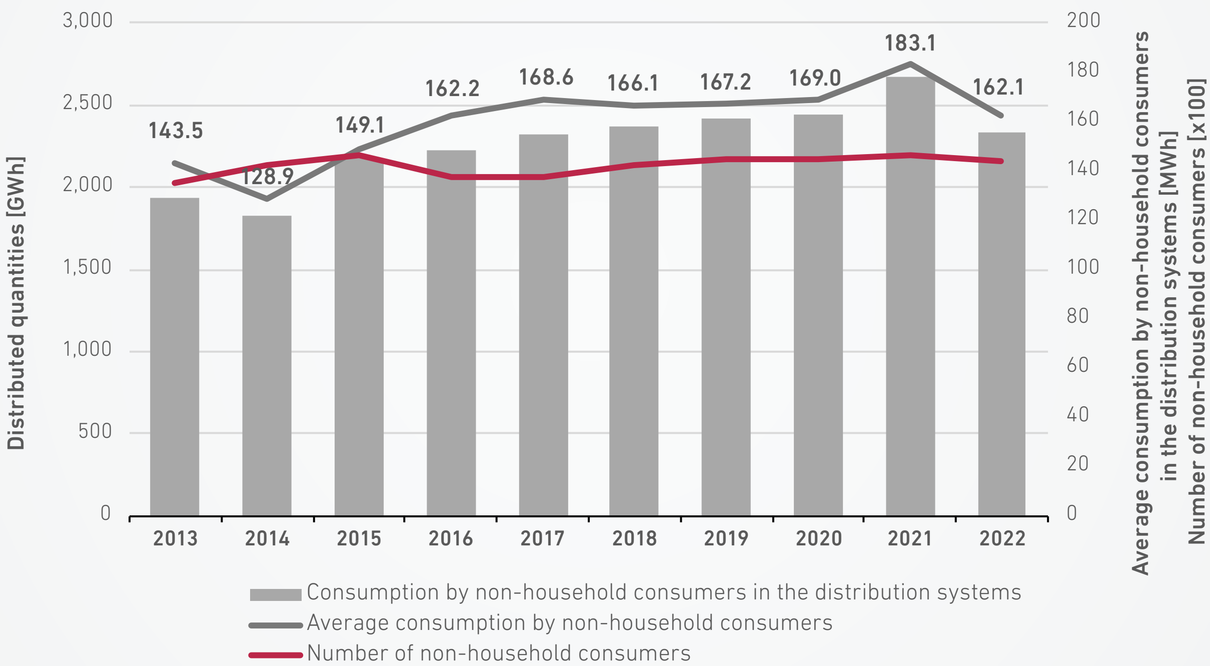


SOURCES: ENERGY AGENCY, DSOs

In addition to heating, non-household customers also used natural gas for technological and production processes, cooling and other activities. At the end of 2022, 231 non-household consumers were connected to the distribution system, less than the year before, and the recorded total annual consumption of non-household customers decreased by almost 13%. The consumption of non-household customers was just under 5% lower than the average of the five-year period of 2017–2021. The average annual consumption of non-household customers decreased by more than 11%, and the high prices probably had an even greater impact on reducing consumption among these customers than among households. Figure 182 shows the trend in consumption and the number of non-household customers.

A decline in the number of household customers and almost 13% less consumption

FIGURE 182: TOTAL AND AVERAGE CONSUMPTION BY NON-HOUSEHOLD CONSUMERS IN THE DISTRIBUTION SYSTEMS IN THE 2013–2022 PERIOD



SOURCES: ENERGY AGENCY, DSOs

None of the five ZDS operators served household consumers. The average annual consumption of natural gas consumers connected to CDSs was 13 GWh, which is approximately 42% of the consumption of the average consumer in the transmission system. Most of the consumption in the CDS areas is intended for technological and production processes of industrial customers, while a negligible part of the consumption is by smaller business customers who use gas mainly for space heating and sanitary water.

None of the distribution system operators and CDSs 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 still without connected generating sources

The Use of Compressed and Liquefied Natural Gas and Other Gases from the Distribution Systems

Compressed Natural Gas in Transport

Compressed natural gas (CNG) is mainly used in transport for personal, delivery and goods vehicles, as well as public bus transport, especially for short and medium distances. In 2022, the number of public filling stations increased by one. Supply was mainly provided to users on the Maribor–Celje–Ljubljana–Jesenice route with a network of six public refuelling stations, three in Ljubljana and one each in Maribor, Celje and Jesenice. The expansion of the public infrastructure is one of the key factors for increasing the number of users, alongside a competitive supply price and an adequate supply of competing vehicles.

9% higher consumption of CNG in transport than in 2021 and 43% higher than in 2020

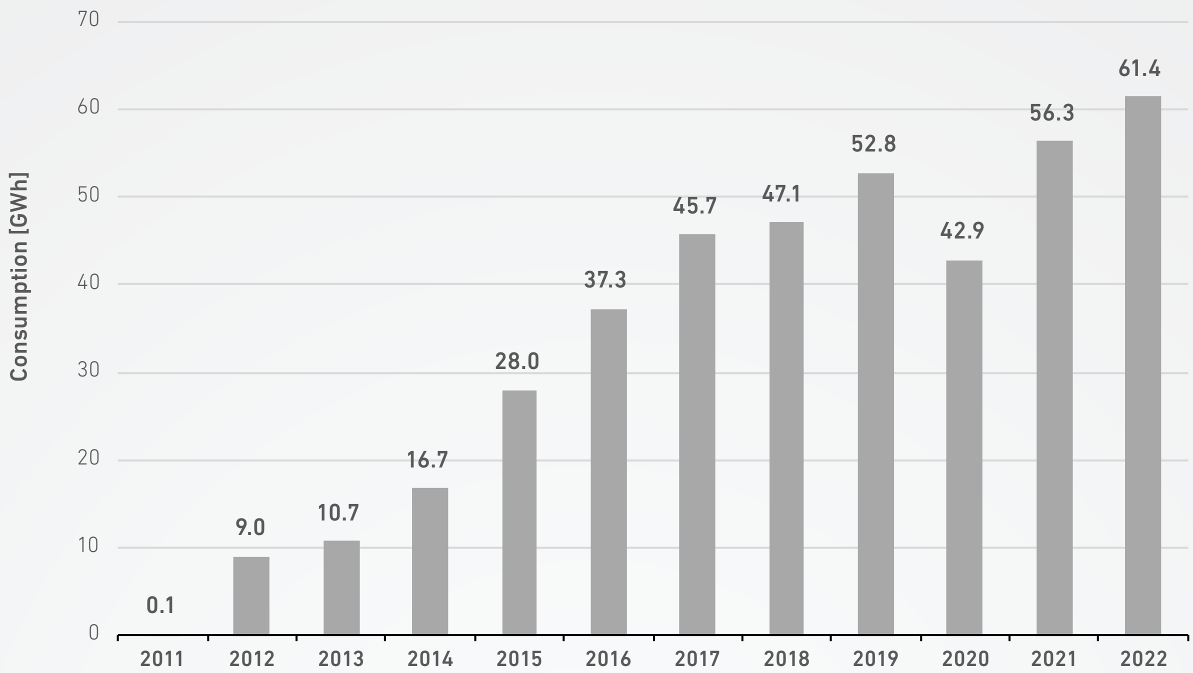
Based on the collected data, none of the existing refuelling station providers are planning to expand their network of these stations. The unstable conditions on international markets and the increase in natural gas prices on the wholesale markets, which we have witnessed since the second half of 2021, while record high values were recorded in 2022, may have a negative impact on the expansion of the network of filling stations or the establishment of a new filling infrastructure in the areas of all the major cities with an available gas network, or even completely halt such investments. An additional risk for further expansion is the accepted requirements to reduce the annual consumption of natural gas. The objectives of the Decree establishing the infrastructure for alternative transport fuels were not achieved. The lack of interest in new charging stations goes back to 2020, when consumption in public passenger transport dropped significantly due to the Covid-19 epidemic. In 2021, consumption increased again, but the decisions of potential investors were probably already being influenced by the rise in natural gas prices and the much more advertised electromobility. In 2022, however, the high retail prices of CNG in individual areas completely destroyed the cost competitiveness of CNG compared to petrol and diesel fuel.

Due to the high gas prices, unstable conditions, requirements to reduce gas consumption and the focus on the electrification of transport, there is no interest in the construction of new public refuelling stations for CNG

In 2022, the total consumption of CNG in transport increased significantly compared to 2021 and 2019, namely by 9% compared to 2021 and more than 43% compared to 2020. The annual consumption was higher in all areas with an established supply. While in the past period, the main obstacles to the growth of the number of individual users were the poor recognition of this type of fuel, the small number of filling stations and the negligible range of CNG vehicles, the price of CNG increased in 2022 to values that no longer guarantee savings compared to other fuels.

The retail prices for a kilogram of compressed gas have been quite stable for a long time. From October 2015 to July 2021, the prices were lowest in Ljubljana and amounted to 0.92 euros, and then decreased to EUR 0.85 in the second half of 2021. In February 2022, it then increased to EUR 1.4, in May to EUR 1.63, in September to EUR 1.7 and in October to EUR 2. In other areas with established publicly accessible filling stations, in Maribor, Celje and Jesenice, the prices varied from EUR 1.2 to EUR 1.75. In 2022, the lowest retail price was offered in Celje, where it was EUR 0.95 until June 14, and EUR 1.25 for the rest of the year. The prices in Maribor were also favourable, EUR 1.3 in January 2022, and EUR 1.2 for the rest of the year. Considering the large differences in the prices offered in individual areas, the supply of users was no longer particularly competitive compared to the costs of gasoline and diesel fuel.

FIGURE 183: CONSUMPTION OF CNG IN TRANSPORT IN THE 2011–2022 PERIOD



SOURCES: ENERGY AGENCY, OPERATORS OF CNG FILLING STATIONS

Liquefied Natural Gas

68% lower consumption of CNG

Liquefied natural gas (LNG) is used for the temporary supply of customers and as an alternative fuel for goods vehicles. The total volumes of LNG sold in 2022 decreased by more than 68% compared to the previous year, and by almost 52% compared to 2020. The main reason for the large decrease in consumption is the cessation of supply to the distribution system in the municipality of Grosuplje at the end of 2021, when it was connected to the natural gas distribution system of the operator Energetika Ljubljana.

The volumes of LNG used in total for the interventional temporary supply of gas systems decreased by more than 10% compared to the previous year. Of the total consumption of LNG, the share of temporary supply was just under 14%, and the remaining share of just over 86% was the consumption of LNG filling stations intended for the supply of goods vehicles.

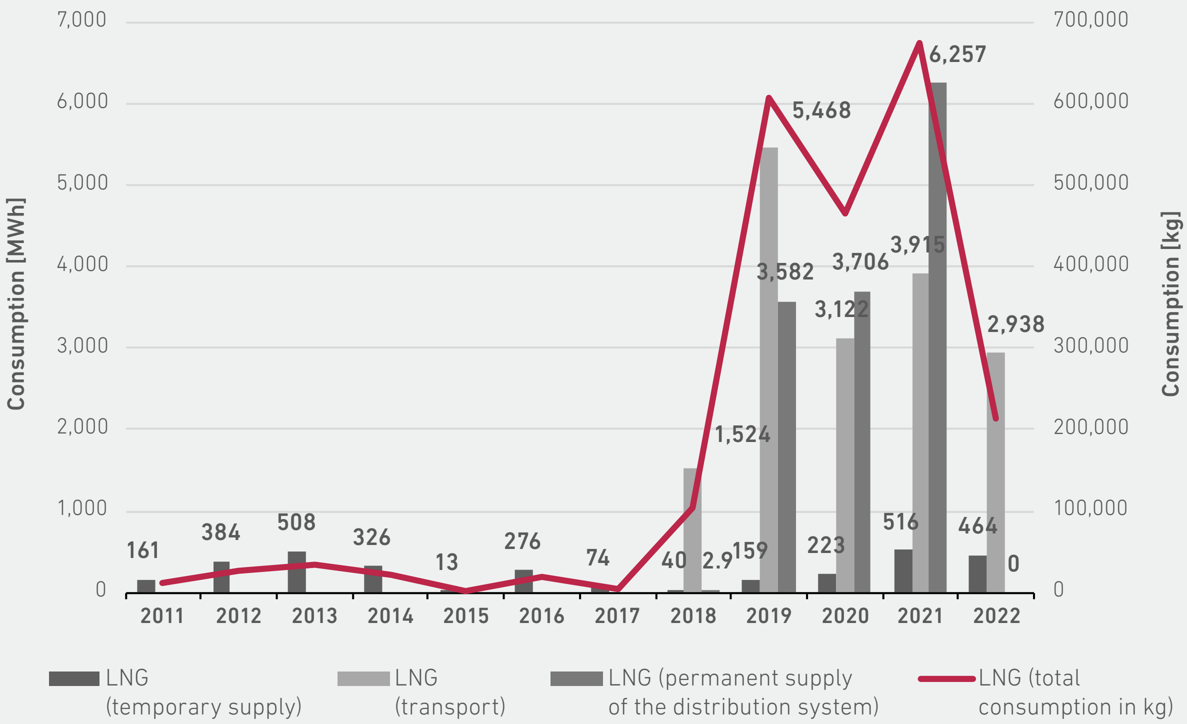
In transport, LNG is used as an alternative fuel for refuelling heavier road vehicles over longer distances and for shipping. In 2022, two public filling stations for LNG in Sežana and, from April, a filling station on Letališka cesta in Ljubljana. Due to the high prices of natural gas, the unstable conditions on international markets and insufficient incentives for the purchase of LNG-powered trucks and the consequent use of this energy source, the only provider of LNG in transport is currently not planning any new filling stations. Based on the collected data, a new provider is planning the construction of three LNG filling stations in Slovenia, with the first planned for 2024 and the remaining two in 2026 and 2027. The volumes of LNG sold for driving in traffic in 2022 decreased by 25% compared to 2021, which is probably also a result of the rise in natural gas prices in the last two years.

High prices reduce interest in the use of LNG

The cost competitiveness of LNG compared to diesel fuel has deteriorated significantly in 2022 due to the very high prices of LNG. Despite the environmental appropriateness of the use, the exemption of tolls for LNG trucks in some countries, and certain other benefits for LNG trucks, the use was not stimulating, or it was more difficult to justify it cost-wise in the current conditions.

Figure 184 shows the sold volumes by individual year and the type of use.

FIGURE 184: CONSUMPTION OF LNG IN THE 2011–2022 PERIOD



SOURCE: ENERGY AGENCY

Other Energy Gases from Distributions Systems

The distribution of other energy gases (energy gases used as an energy fuel other than natural gas) from distribution systems that are not directly or indirectly connected to the gas transmission system was carried out by four distribution companies in Slovenia in 2022. Propane and propane-butane mixture were primarily distributed as other energy gases. The distribution of other energy gases was carried out from 527 distribution systems in 122 Slovenian municipalities. In 116 municipalities, distributors from 480 distribution systems carried out supply as a market activity, and as a service of general economic interest in the remaining 47 distribution systems in nine municipalities.

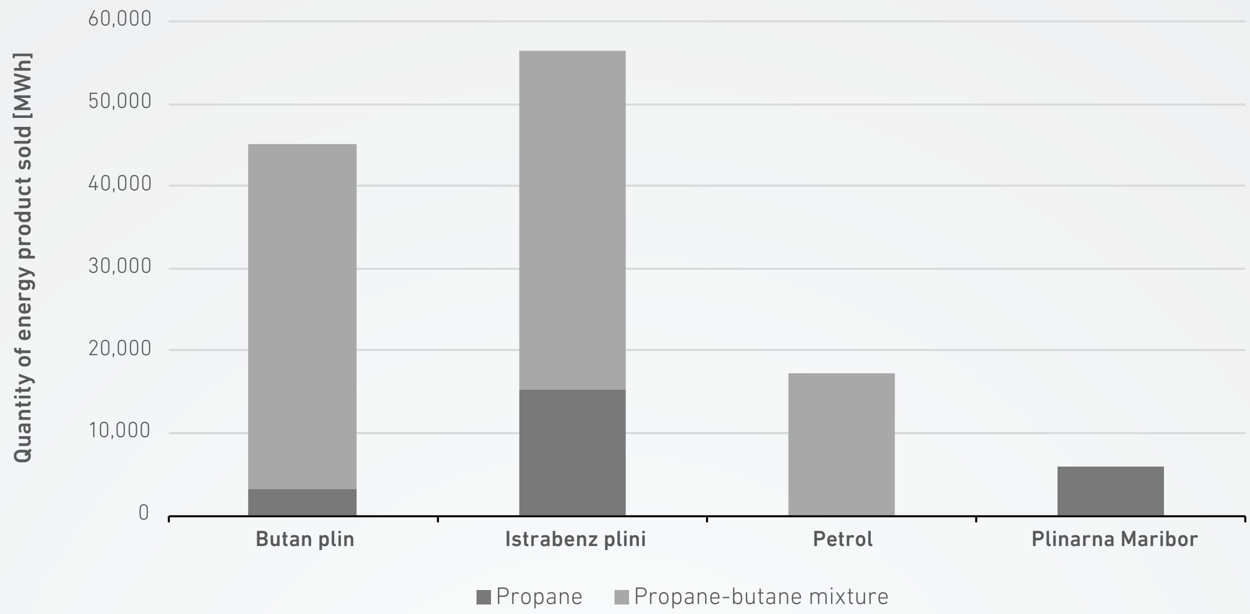
In 2022, 7,273 consumers were supplied from the distribution systems of other energy gases, which is 1.5% more than the previous year, and the distributed energy value of gases[156] reached 124.9 GWh, which is a 10.3% decrease compared to the previous year. The consumer's average annual consumption in 2022 amounts to 17.2 MWh, which is an 11.6% decrease compared to the previous year. The number of customers connected to the distribution systems in individual municipalities varied from 2 to 1,936, and the average number of consumers per distribution system was 14.

The total length of the distribution systems decreased by 0.2% compared to 2021 and amounted to 114.5 kilometres. Figure 185 shows the distributors according to the type and quantities of other energy gas sold.

10.3% lower consumption of other energy gases

156 Due to corrections to the data for 2021 by the reporters after the publication of last year's report, the comparative changes between 2022 and 2021 may deviate from the data presented in last year's report.

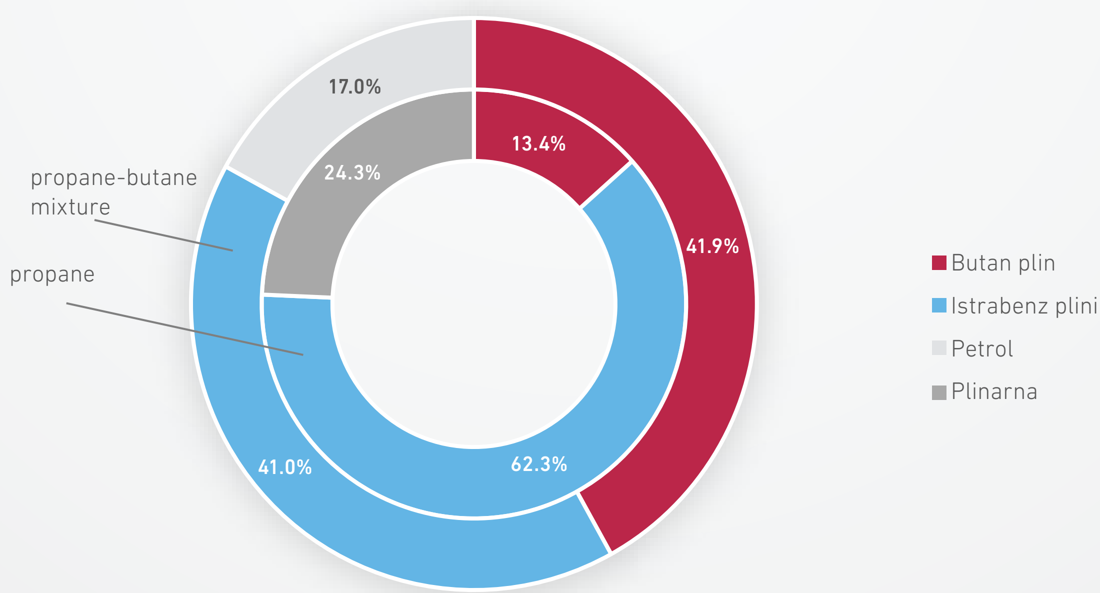
FIGURE 185: DISTRIBUTED QUANTITIES OF OTHER ENERGY GASES BY DISTRIBUTORS AND THE TYPE OF GAS



SOURCE: ENERGY AGENCY

Figure 186 shows the market shares[157] of distributors of other energy gases by type of gas and the energy value of the quantities sold in 2022, while Figure 187 shows the market shares of distributors by the type of energy gas sold and the number of consumers served.

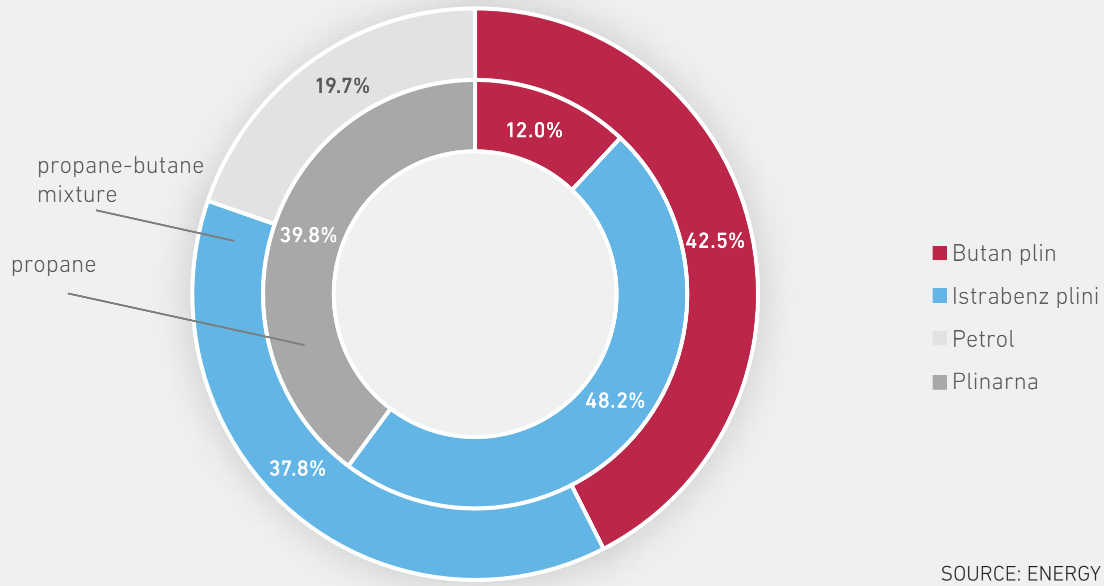
FIGURE 186: MARKET SHARES OF OTHER ENERGY GAS DISTRIBUTORS (ENERGY VALUE OF THE QUANTITIES SOLD)



SOURCE: ENERGY AGENCY

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

FIGURE 187: MARKET SHARES OF OTHER ENERGY GAS DISTRIBUTORS (NUMBER OF CONSUMERS)



SOURCE: ENERGY AGENCY,

The Regulation of Network Activities

Unbundling

In Slovenia, in 2022, one operator performed the obligatory service of general economic interest of natural gas TSO, while in the same period, the service of general economic interest of gas DSO was carried out by 13 entities and remained unchanged compared to the previous year. The TSO, Plinovodi, owns the assets with which it carries out its activities and is certified and designated as an independent TSO. The transmission system operator is owned by Plinhold, of which the Republic of Slovenia is the majority shareholder with a 60.10% share.

Distribution system operators are not legally separated, as there are no more than 100,000 consumers connected to each distribution system. Given that other energy and market activities were carried out by 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 criteria and the correctness of the application have to be audited annually by an auditor who makes a special report.

Technical Functioning

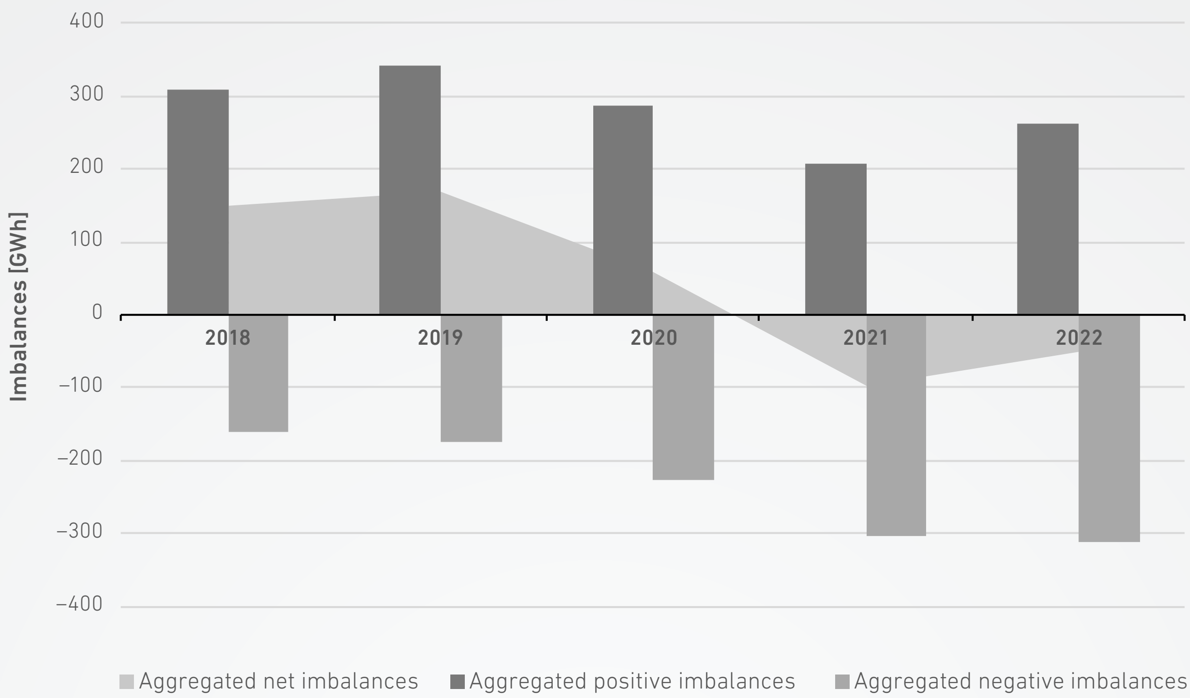
Balancing Services

In 2022, there were 17 active balance group leaders in Slovenia, four less than the year before. Of these, seven also transported natural gas through Slovenia to other transmission systems.

261 GWh of positive imbalances (27% annual increase), 304 GWh of negative imbalances (3% annual increase)

Through the purchase and sale of natural gas on the trading platform and with an annual balancing contract, the transmission system operator has managed to balance the transmission system and carry out imbalance accounting. The entire transmission system is one balancing area; imbalances are determined on a daily basis and calculated on a monthly basis for each gas day.

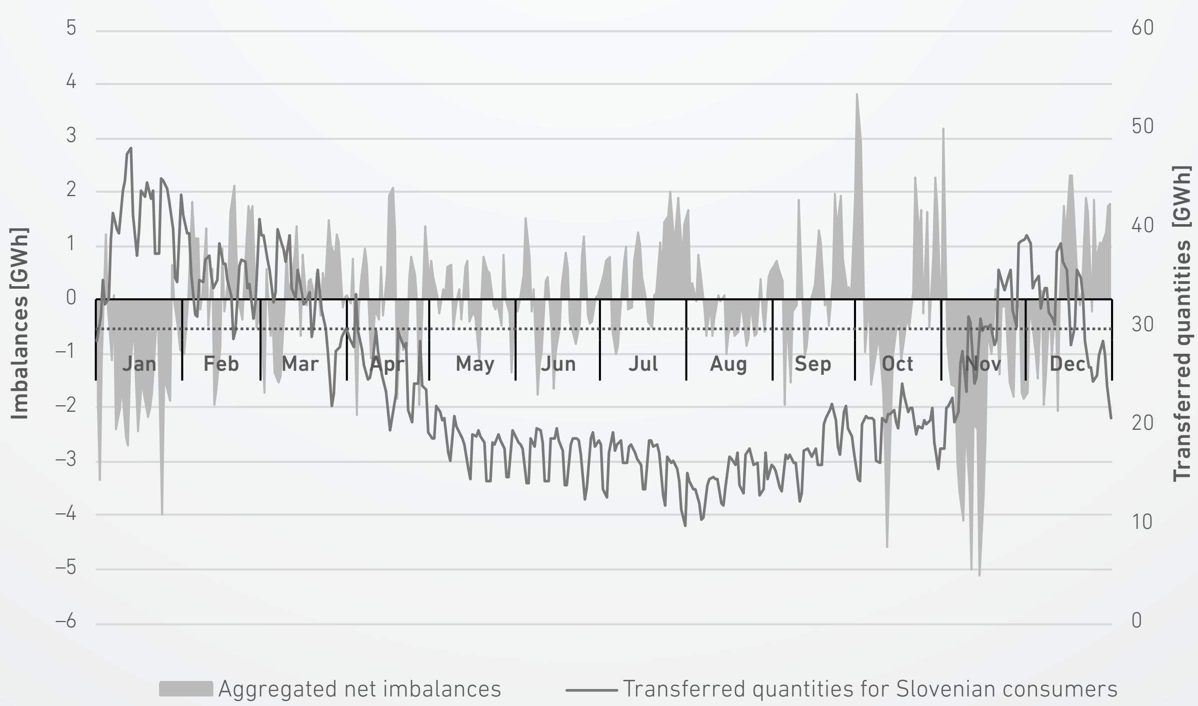
FIGURE 188: AGGREGATED NET IMBALANCES OF THE BALANCING GROUP LEADERS IN THE 2018–2022 PERIOD



SOURCES: ENERGY AGENCY, PLINOVODI

Although aggregated positive imbalances were 27% higher than the previous year, the trend of negative aggregated net imbalances continued in 2022. These were 3% higher than the year before, and in absolute terms, they were 19% higher than the aggregated positive imbalances.

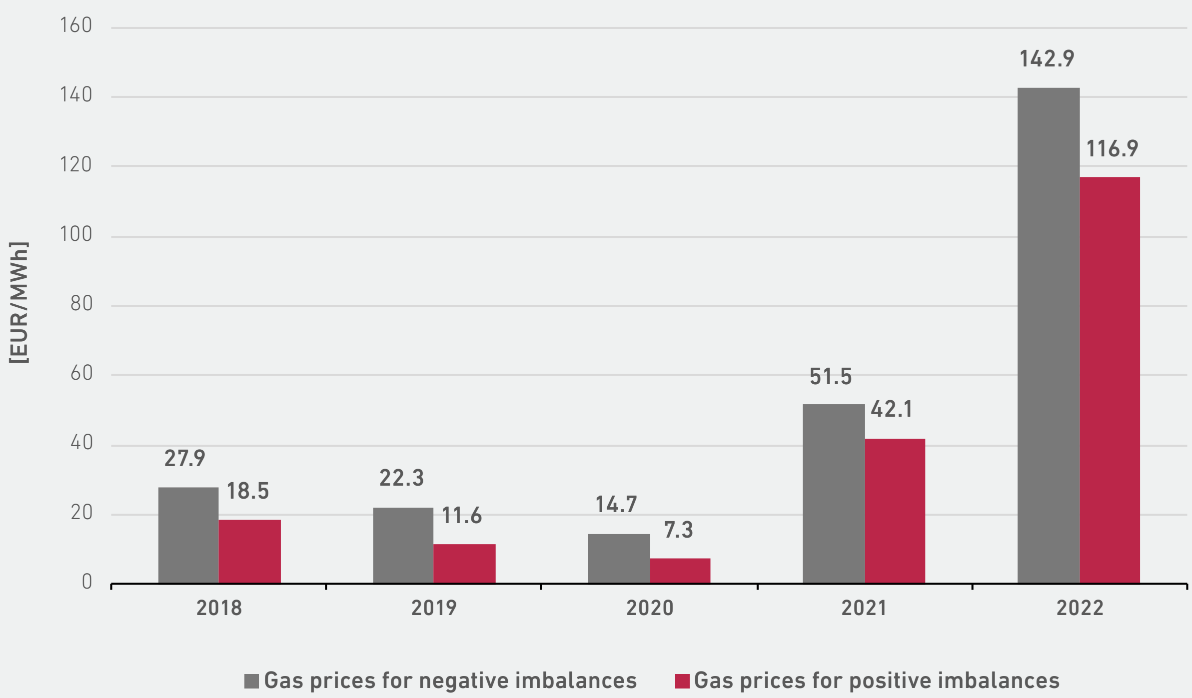
FIGURE 189: AGGREGATED NET IMBALANCES OF THE BALANCE GROUP LEADERS AND TRANSFERRED QUANTITIES FOR SLOVENIAN CONSUMERS IN 2022



SOURCES: ENERGY AGENCY, PLINOVODI

The negative aggregated imbalances are the result of a change in the methodology for calculating imbalances in 2020, which enabled a lower ratio between the prices for negative and positive imbalances.

FIGURE 190: AVERAGE GAS PRICES FOR IMBALANCES IN THE 2018–2022 PERIOD

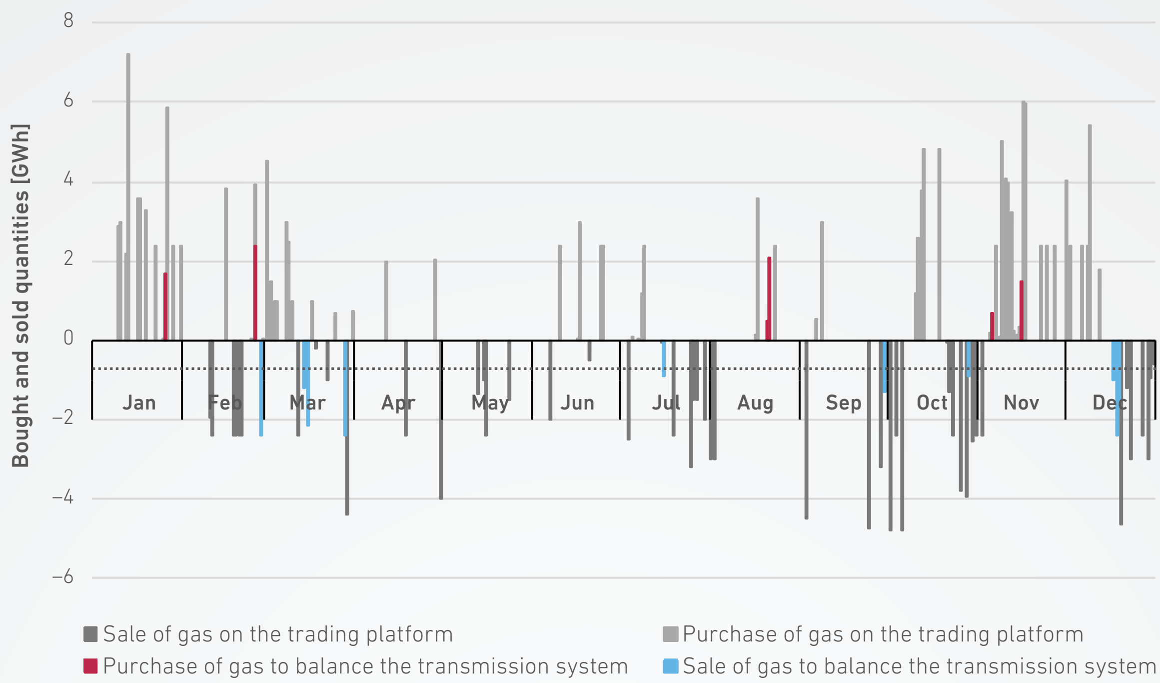


SOURCES: ENERGY AGENCY, PLINOVODI

The imbalances of the balancing group leaders at the annual level amounted to 6.3% of the quantities consumed by Slovenian natural gas consumers, which is 1.3 percentage points lower than the previous year.

By trading on the trading platform and dynamic pressure control, the TSO managed to ensure the regular operation of the transmission system. In doing so, the TSO used the system's transmission system balancing service every three weeks on average. It sold gas ten times and bought it six times under the annual transmission system balancing contract.

FIGURE 191: TSO's TRADING ON THE TRADING PLATFORM AND THE USE OF THE SYSTEM BALANCING SERVICE IN 2022



SOURCES: ENERGY AGENCY, PLINOVODI

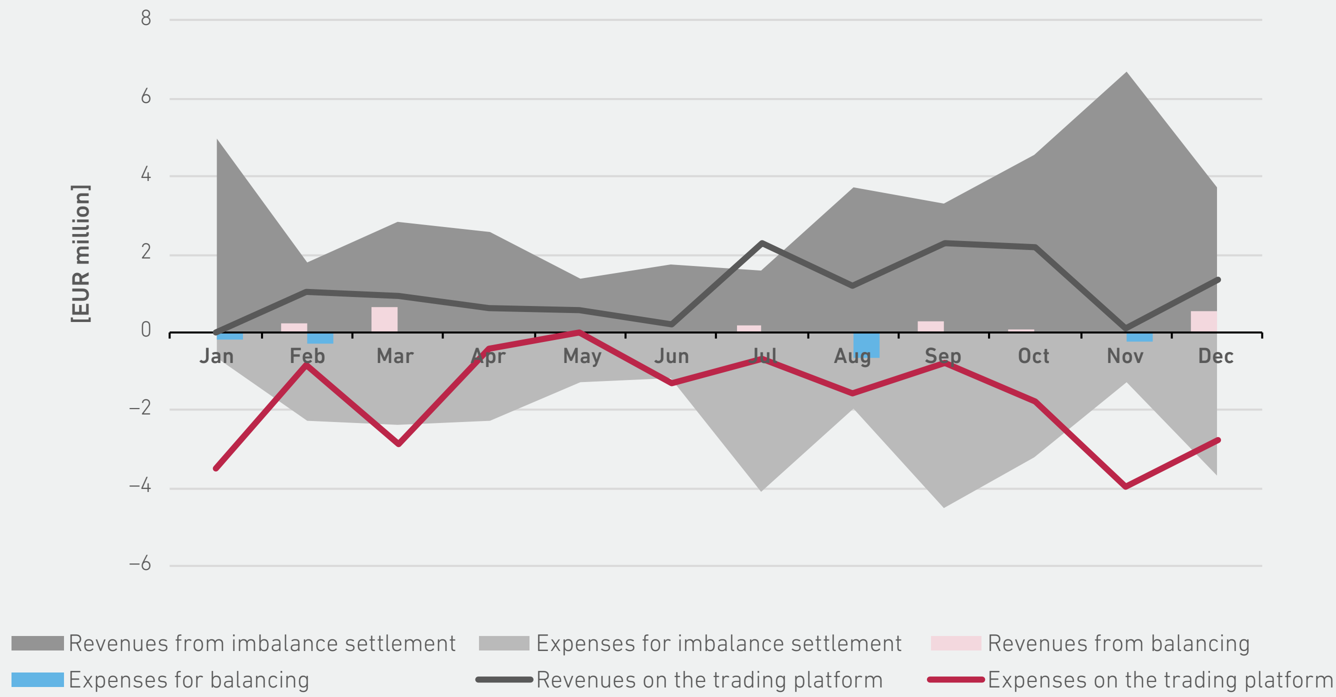
On the trading platform, the TSO generated 3.8 times more revenues than the previous year, while at the same time incurring twice the expenses as the year before. Revenues and expenses from balancing are 2.6 times higher than the year before. Higher revenues and expenses from trading on the trading platform and from imbalances are the result of sale and purchase prices of natural gas that are several times higher. The TSO is cost-neutral in the accounting of imbalances, the purchase and sale of gas for balancing the transmission system, and in trading on the trading platform, i.e., it distributes surpluses or deficits proportionally among the balance group leaders. In 2022, it generated a surplus of EUR 2.83 million, which is more than three times more than the year before.

TABLE 35: REVENUES AND EXPENSES OF TSOs ON THE TRADING PLATFORM, SETTLEMENT OF DAILY IMBALANCES AND AVERAGE SALES/PURCHASE PRICES

Activity/service TSO		2021	2022
Trading platform	Revenues [mio EUR]	3.4	12.8
	Average sales price [EUR/MWh]	37.9	110.5
	Expenses [mio EUR]	–10.1	–20.6
	Average purchase price [EUR/MWh]	50.4	124.0
System balancing service	Revenues [mio EUR]	1.1	1.9
	Average sales price [EUR/MWh]	103.4	113.2
	Expenses [mio EUR]	–0.2	–1.3
	Average purchase price [EUR/MWh]	76.3	149.7
Imbalances	Revenues [mio EUR]	16.4	38.9
	Average marginal purchase price – settlement of negative imbalances [EUR/MWh]	51.5	142.9
	Expenses [mio EUR]	–9.8	–28.8
	Average marginal sales price – settlement of positive imbalances [EUR/MWh]	42.1	116.9

SOURCES: ENERGY AGENCY, PLINOVODI

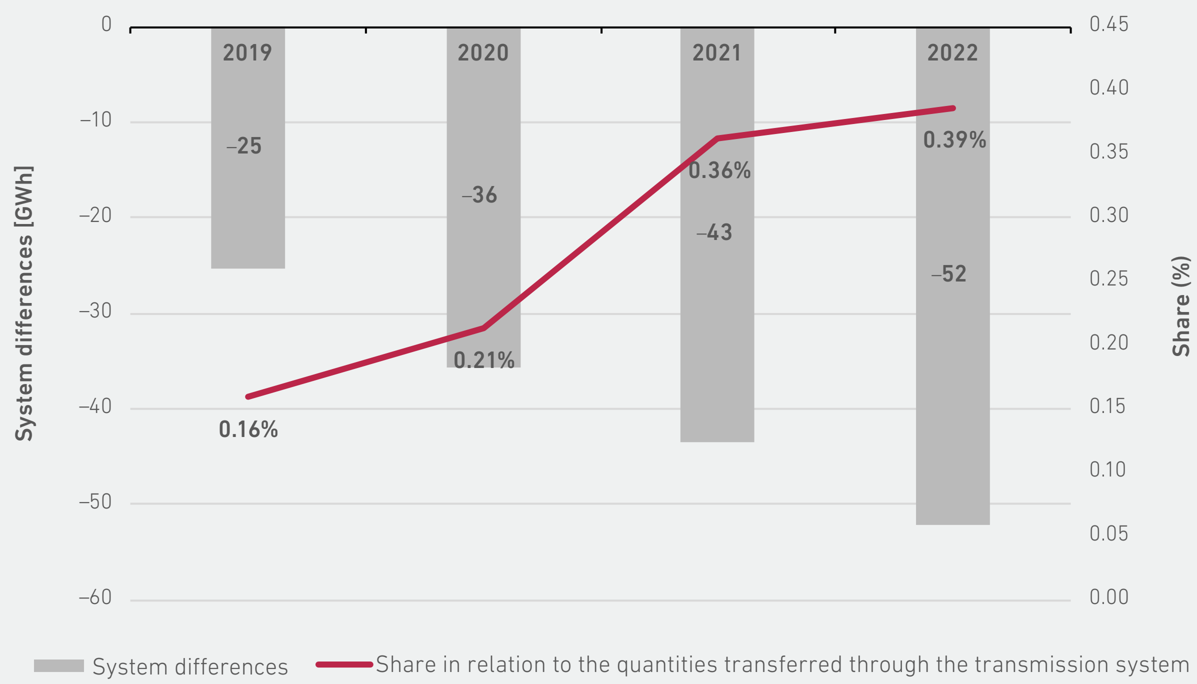
FIGURE 192: REVENUES AND EXPENSES OF TSOs ON THE BALANCING MARKET



SOURCES: ENERGY AGENCY, PLINOVODI

The trend of increasing negative system differences continued in 2022. Compared to the previous year, they were 20% larger. Since the beginning of the monitoring of system differences in 2019, the proportion of negative system differences has also been increasing in relation to the quantities transferred through the transmission system.

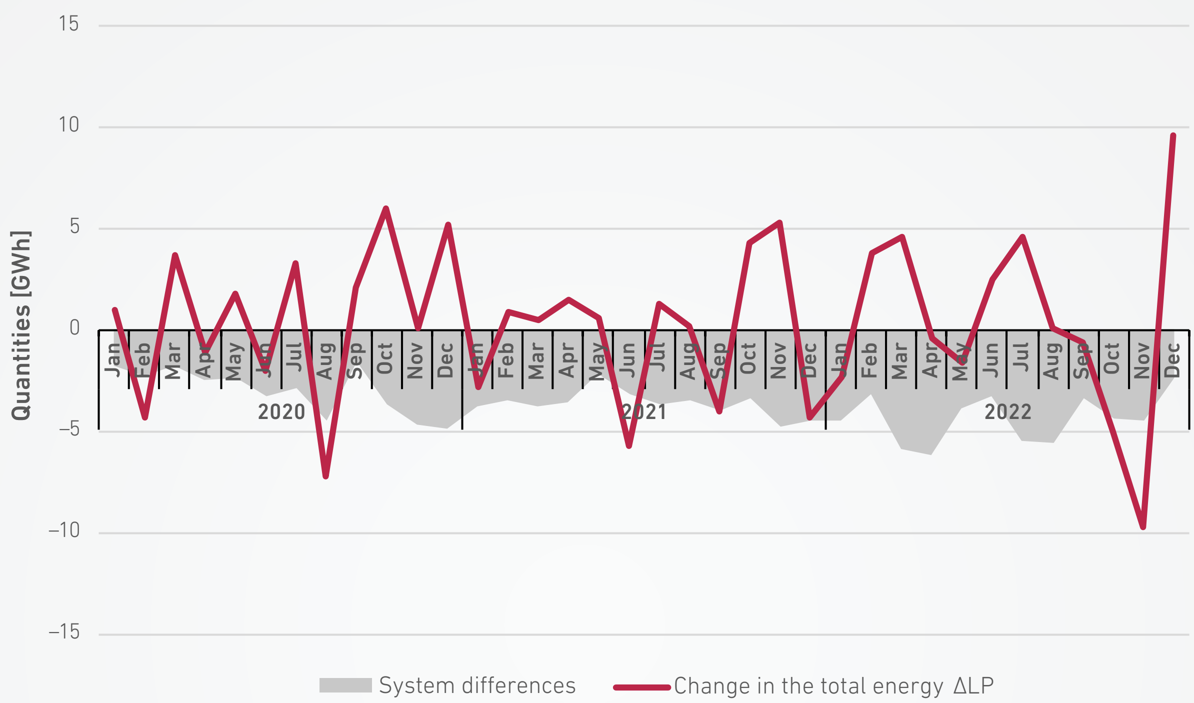
FIGURE 193: SYSTEM DIFFERENCES AND THE SHARE IN RELATION TO THE QUANTITIES TRANSFERRED THROUGH THE TRANSMISSION SYSTEM IN THE 2019–2022 PERIOD



SOURCES: ENERGY AGENCY, PLINOVODI

From November 2022, the system differences have been divided into system differences due to measurement uncertainties and system differences due to losses.

FIGURE 194: SYSTEM DIFFERENCES AND THE CHANGE IN THE TOTAL ENERGY ΔLP IN THE 2020–2022 PERIOD

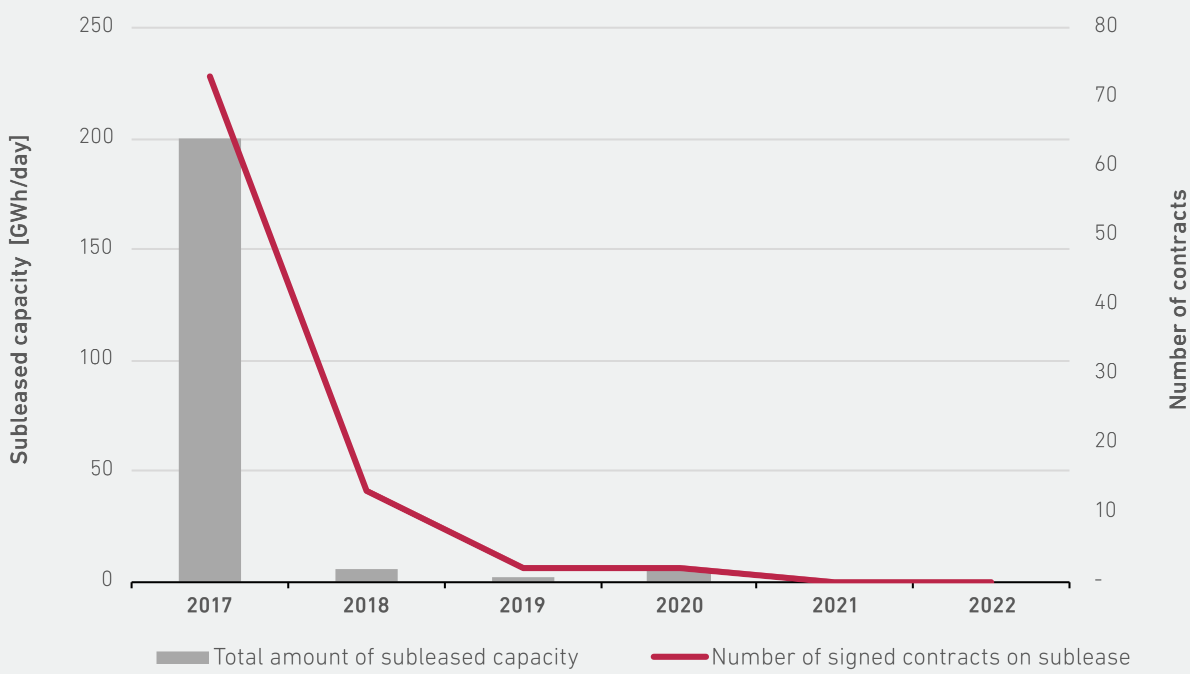


SOURCES: ENERGY AGENCY, PLINOVODI

Secondary Market for Transmission Capacity

There was no trading in the secondary transmission capacity market for the second consecutive year.

FIGURE 195: TREND IN THE DEVELOPMENT OF THE SECONDARY TRANSMISSION CAPACITY MARKET IN THE 2017–2022 PERIOD



SOURCES: ENERGY AGENCY, PLINOVODI

The year 2017 was the turning point for trading on the secondary market for transmission capacity, with most of the long-term transmission contracts expiring. A sharp reduction in capacity booking at border points, a growing trend of short-term capacity booking, and the better optimisation of capacity booking by transmission system users have also contributed to the declining role of the secondary market.

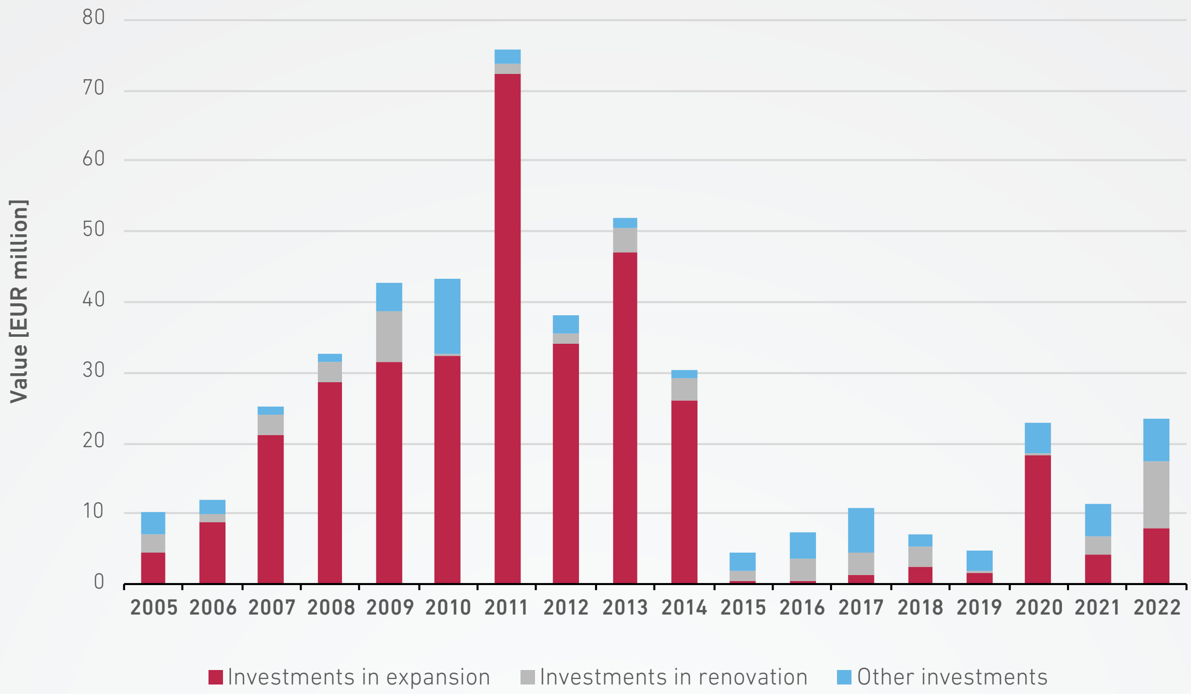
The Multi-Year Development of the Transmission Network

Investments in the Natural Gas Transmission System

The TSO allocated EUR 23.5 million in investments in the transmission system, which is twice as much as the year before. Investments in the network expansion amounted to EUR 7.8 million, investments in renovation EUR 2.59 million, and other investments EUR 4.53 million. Investments in the network expansion amounted to EUR 7.8 million, investments in renovation EUR 9.7 million, and other investments EUR 6 million. 70% of the investments were financed from the depreciation of fixed assets, while the rest of the investments were financed from other own funds.

Investments of EUR 23.5 million in the transmission system – twice as much as the year before

FIGURE 196: INVESTMENTS IN THE NATURAL GAS TRANSMISSION SYSTEM IN THE 2005–2022 PERIOD



SOURCES: ENERGY AGENCY, PLINOVODI

In the implementation of investments, the year 2022 was marked by activities for obtaining permits for the M6 transmission gas pipeline from Ajdovščina to Lucija and the supply of pipes for the first section from Ajdovščina to Sežana. During this period, the transmission system operator completed the construction of the Stanežiče MRS, Jelovškova MRS, Starošinci MRS and Črenšovci MRS facilities. The construction of the project »Arrangement of Replacement Premises and Access of the Transmission System Operator« began, and a contract for the supply of a new compressor unit and a contract for construction was signed for the expansion of the Ajdovščina compressor station. Among the improvements, the TSO completed an upgrade of MRS Šempter and thus increased the transmission capacity of the connection point with Italy. The project to improve the transmission gas pipeline R29 in the area of Jesenice, including MRS Bela and MRS Levi breg, was completed, and an operating permit was obtained.

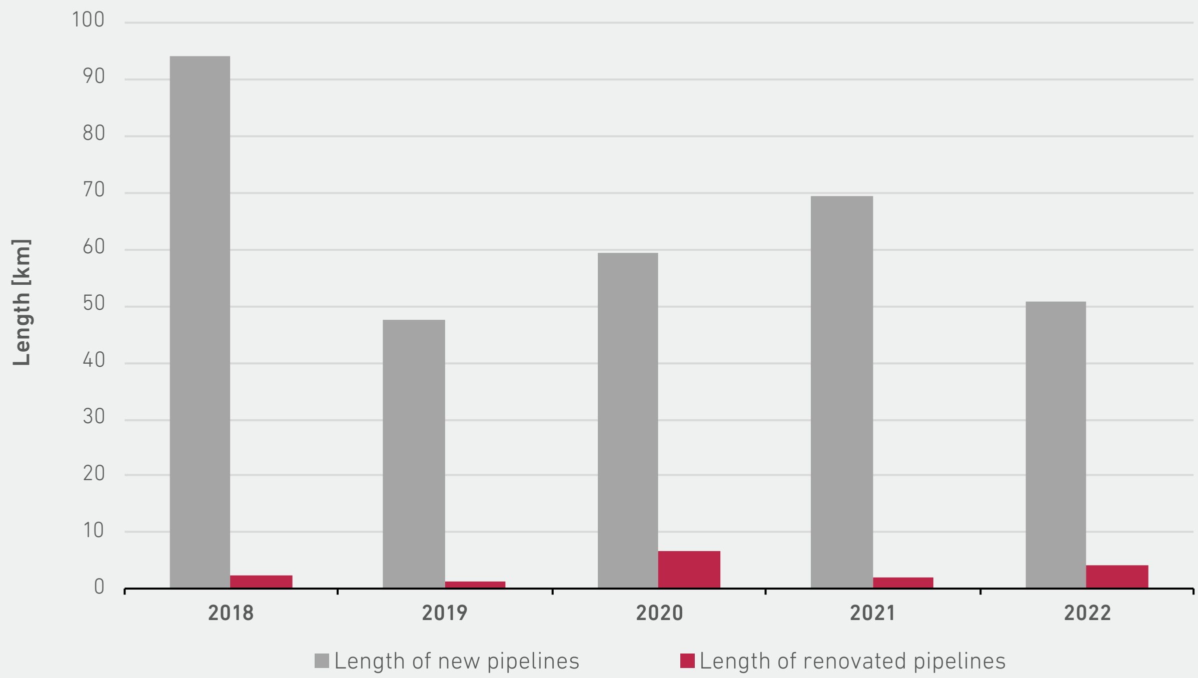
In 2023, the TSO will continue the construction of the M6 Ajdovščina–Lucija gas pipeline. The construction of the section to Sežana is expected to be completed, the gas pipeline to Koper will be built in 2024, and the completion of the project is planned for 2025 with the construction of the Izola-Lucija section. Construction of the Control Centre will continue. The completion of the construction of the Dobrunje MRS and the continuation of the construction of the Sava MRS, the Koto MRS, and the Trbovlje–Hrastnik section with the Hrastnik MRS and Podkraj MRS are also planned. Coordination between the operators of neighbouring countries will also continue for the construction of the Hungary-Italy and Croatia-Austria gas pipeline corridors, which should pass through Slovenian territory.

Investments in the Natural Gas Distribution Systems

Distribution system operators built 50.8 kilometres of new gas pipelines, which is 27% less than the previous year. 4.3 kilometres of distribution gas pipelines were renovated, which is more than twice as much as in 2022.

50.8 km of new distribution pipelines, 27% less than the year before

FIGURE 197: TREND OF BUILDING AND RENOVATING PIPELINES IN THE 2018–2022 PERIOD

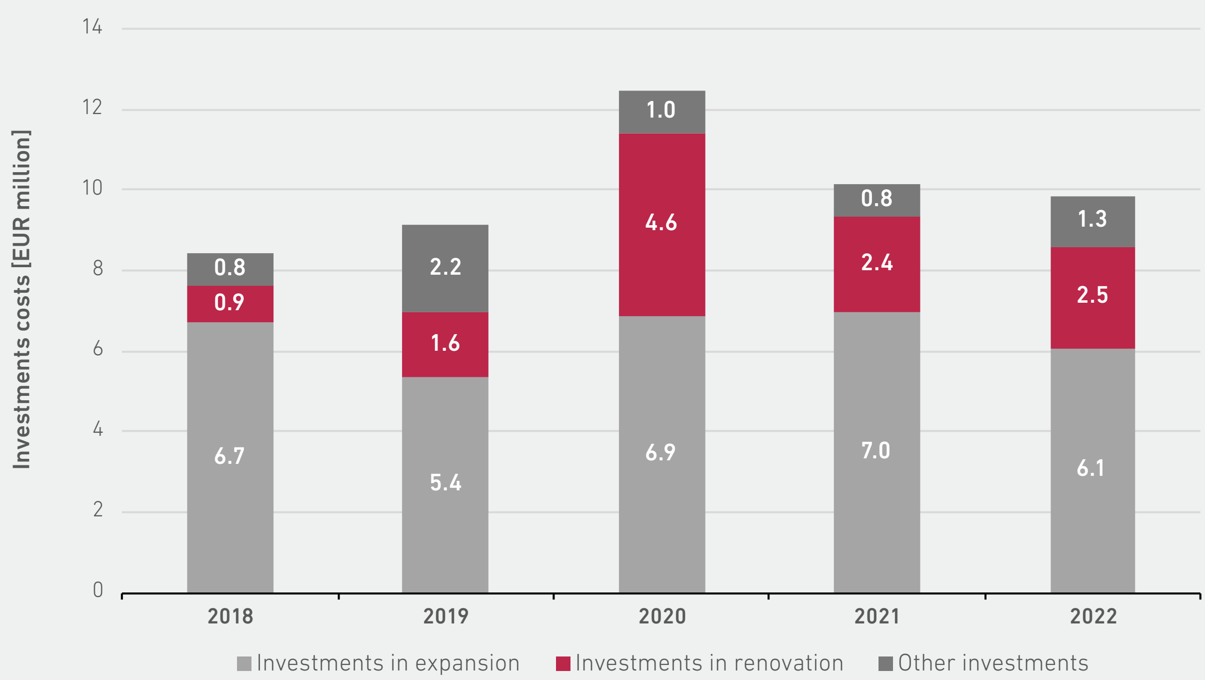


SOURCE: ENERGY AGENCY

The total value of investments in distribution systems amounted to EUR 9.86 million, which is just under 3% less than the previous year. Investments in network expansion amounted to EUR 6.09 million, investments in the renovation of distribution systems amounted to EUR 2.52 million, and other investments not directly related to the construction or renovation of distribution systems amounted to EUR 1.25 million.

4.3 km of renovated distribution pipelines

FIGURE 198: COSTS OF INVESTMENTS IN GAS DISTRIBUTION PIPELINES IN THE 2018–2022 PERIOD

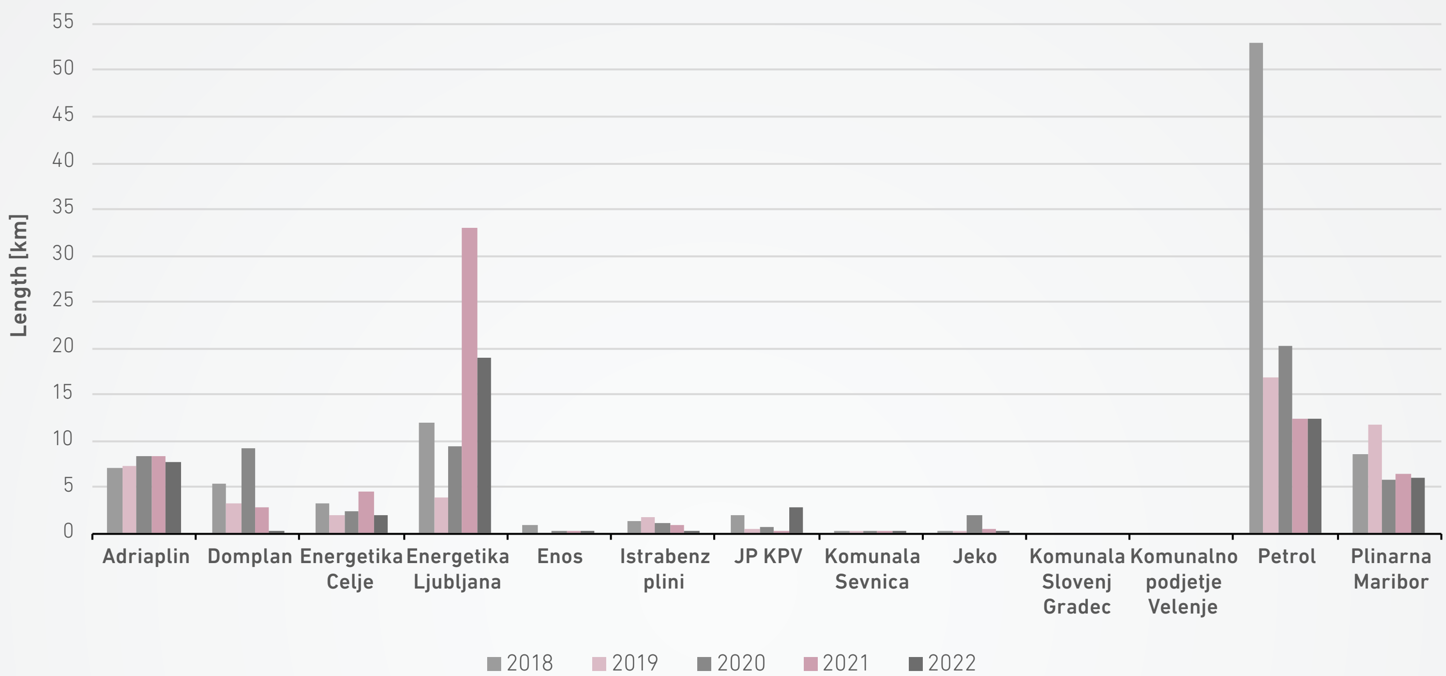


SOURCE: ENERGY AGENCY

Figure 199 shows the intensity of new pipeline construction by each DSO. Over the last five years, the five most active operators together cover 91% of the new pipelines, while the remaining eight operators have hardly expanded their distribution systems, building only 9% of the new pipelines.

EUR 9.9 million investments in distribution systems – 3% less than the year before

FIGURE 199: LENGTH OF THE NEW DISTRIBUTION NETWORKS IN THE 2018–2022 PERIOD BY OPERATORS



SOURCE: ENERGY AGENCY

The Security and Reliability of Operation and the Quality of Supply

The TSOs, DSOs and CSOs ensured the safe and reliable transport of natural gas through their networks, connected and performed all the necessary maintenance work on the networks.

The daily peak load in the transmission network was recorded at the end of the winter (21 March 2022) and amounted to 3,160 MWh/h.

The TSO issued nine connection consents, four less than the previous year. Seven new consumption points[158] were connected to the transmission system. The overall connection process took an average of 381 days.

Less interest in connecting to distribution systems

In 2022, operators of natural gas distribution systems received 962 applications for connection consent and issued 956 consents. The number of applications received and approvals issued decreased by almost 58% compared to the previous year. The operators connected 1,021 consumption points this year, which is only half compared to 2021.

158 The number of new connections does not reflect the difference in the number of active consumption points in the transmission system at the end of 2022 compared to the previous year, because the total number of active consumption points only includes those with a contract for leasing transmission capacity.

The average time taken to connect new consumers to the distribution system was up to 20 working days after a complete connection application was submitted for eight operators. At the other five, the overall connection process took from 27 to 48 working days on average. Physical connection to the network took four working days on average for 12 operators. At one operator, the average time taken to complete the physical connection was 22 working days.

There were no new connections in the five CDS areas in 2021.

Reliable and safe operation to ensure an uninterrupted supply to consumers was ensured by the TSO and DSOs through regular and emergency maintenance.

The TSO carried out 54 planned and 275 unplanned works in the transmission system. Due to the planned works, the natural gas supply was interrupted for 35 hours, while unplanned works were carried out without an interruption of supply.

There were 2,398 planned works carried out in distribution systems. Their number increased slightly again in 2022, as did the total duration of the works. Regardless of the longer duration of the works, the planned works resulted in 35% less interruption of the natural gas supply to consumers compared to the year before.

The total time of the supply interruptions due to planned works was 793 hours. The planned works on the distribution systems of the four operators were carried out without disruption or interruption of supply. In the distribution systems of one of the operators, the total time of all the interruptions due to planned works did not exceed four hours. In the areas of the remaining eight, the total time of the interruptions due to planned works was between 14 and 521 hours. A total of 521 hours of outages were recorded for the operator with the most customers. According to the operators, the time of each interruption ranged from a minimum of one hour to a maximum of 26 days. In this case, the supply was interrupted for only one out of 985 customers in July. For two of the nine operators with supply interruptions, the longest interruption did not exceed four hours, for two seven hours, for three the longest interruptions lasted for up to 24 hours, and for two a little more than two days, or just under 26 days for the operator with the longest interruption of care. The average duration of the planned interruptions was just under six hours.

There were 592 unplanned interventions in the distribution systems, which decreased by just under 24% compared to the previous year. These interventions resulted in 68 interruptions of supply. The total time of the unplanned interruptions amounted to 201 hours, which is almost 62% less than in the previous year. In the case of seven operators, there were no such interruptions; in the case of four operators, the total time of the unplanned interruptions lasted from 22 to 29 hours, and in the case of the remaining two, the total time of the unplanned interruptions amounted to 42 and 53 hours, respectively.

There were also 444 work projects carried out in the distribution systems at the request and for the needs of third parties; the total time spent on these works amounted to 3,353 hours and did not deviate significantly from the year before.

Maintenance work was carried out in the areas of all CDS operators but did not lead to any supply interruptions. The total duration of the planned work carried out was 6,407 hours, of which the full total time spent carrying out routine maintenance work was 3,545 hours, inspections 2,070 hours, tests 445 hours, and measurement checks 284 hours.

The activities of the TSO and DSOs related to the connection of system users and maintenance works on the system in the 2020–2022 period are shown in Table 36.

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Compared to 2021, the total supply interruption time due to planned works has decreased by 35%

TABLE 36: CONNECTION AND MAINTENANCE WORK PARAMETERS IN THE 2020–2022 PERIOD

Gas operator	TSO			DSOs		
	2020	2021	2022	2020	2021	2022
CONNECTION-RELATED SERVICES						
Number of approvals issued	15	13	9	2,391	2,257	956
Average duration of the administrative procedure [days]	48	40	32	6	7	7
Maximum length of the administrative procedure [days]	-	-	-	15	15	15
Minimum length of the administrative procedure [day]	-	-	-	1	1	1
Number of connections performed	3	1	7	1,328	2,042	1,021
Average duration of the entire connection procedure [days]	468	188	381	14	15	20
Maximum length of the entire connection procedure [days]	-	-	683	40	31	48
Minimum length of the entire connection procedure [days]	-	-	-	2	2	4
MAINTENANCE WORK ON THE SYSTEM						
Number of planned works performed	19	15	54	2,083	2,275	2,398
Total duration of the planned work [hours]	109,032	108,560	106,720	120,909	107,372	130,254
Total duration of supply interruption due to planned work [hours]	13	21	35	784	1,223	793
Maximum duration of each scheduled interruption [hours]	13	11	8	148	150	55
Minimum duration of each schedule interruption [hours]	-	10	6	1	1	1
Number of unplanned interventions performed	198	259	275	430	777	592
Total duration of the unplanned interventions [hours]	504	581	789	1,900	2,390	2.107
Number of supply interruptions due to unplanned work [hours]	1	-	-	134	123	68
Total duration of the supply interruption due to unplanned interventions [hours]	0.25	-	-	627	522	201

SOURCE: ENERGY AGENCY

Network Charges for Gas Transmission and Distribution Systems

Setting the Network Charge

The Energy Agency regulates natural gas transmission and distribution activities on the basis of the regulated network charges method. It ensures that system operators can cover all the eligible costs of the regulatory period and any network charge deficit from previous years by setting network charges and other revenues, taking into account network charge surpluses from previous years. The eligible costs of a system operator are the costs that are necessary for the performance of the distribution or transmission of natural gas and that meet the criteria set out in the methodology for the establishment of the regulatory framework issued 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 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 also determine the tariffs for the regulatory period.

After the end of each year of the regulatory period, 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 on the basis of the criteria for their determination set out in the methodology for setting the regulatory framework. In the context of the identification of deviations from the regulatory framework, the eligibility of system operators for incentives are also verified. Deviations from the regulatory framework are reflected in a deficit or surplus of the network charge.

EUR 147.6 million for the operation of the transmission system in the 2022–2024 regulatory period

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 Regulated Network Charge method gives the system operator the right to take the network charge deficit into account when setting the network charge in subsequent years.

As of 1 January 2022, a new three-year regulatory period for system operators came into force, lasting until 31 December 2024. In 2021, the Energy Agency issued an Act amending and supplementing the Act on the Methodology for Determining the Regulatory Framework for the Operator of the Natural Gas System.

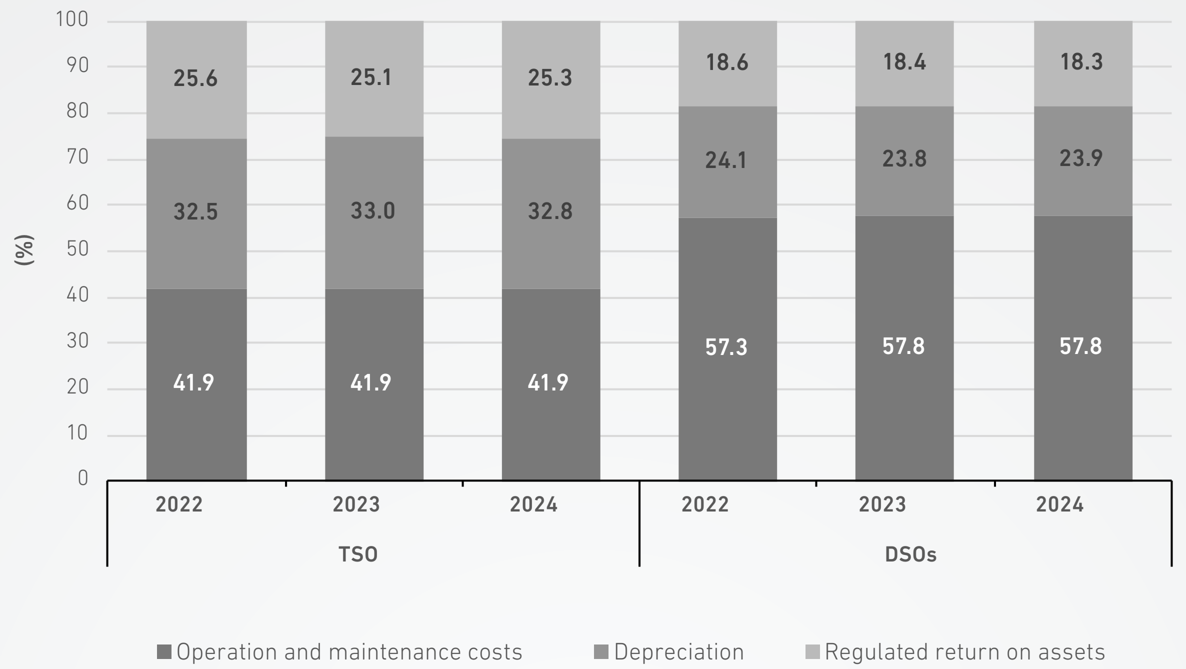
On the basis of that Act, in 2021, the system operators, with the prior consent of the Energy Agency, set the regulatory framework, the network tariffs and the tariffs for other services for the 2022–2024 period.

For this three-year period, the TSO has planned eligible costs of EUR 147.6 million, which is 10% lower than for the previous three-year regulatory period. The distribution system operators have planned a total of EUR 154.5 million of eligible costs for the 2022–2024 regulatory period, which is 1% lower than for the previous three-year regulatory period 2019–2021.

154.5 million for the operation of distribution systems in the 2022–2024 regulatory period

Figure 200 shows the structure of the planned eligible costs of the system operators for each year of the 2022–2024 regulatory period. The comparison of the structures of the planned eligible costs shows that for each year of the 2022–2024 regulatory period, the structure of the planned eligible costs of both the distribution system operators and the transmission system operator does not change significantly.

FIGURE 200: THE STRUCTURE OF THE PLANNED ELIGIBLE COSTS OF THE SYSTEM OPERATORS IN THE 2022–2024 PERIOD

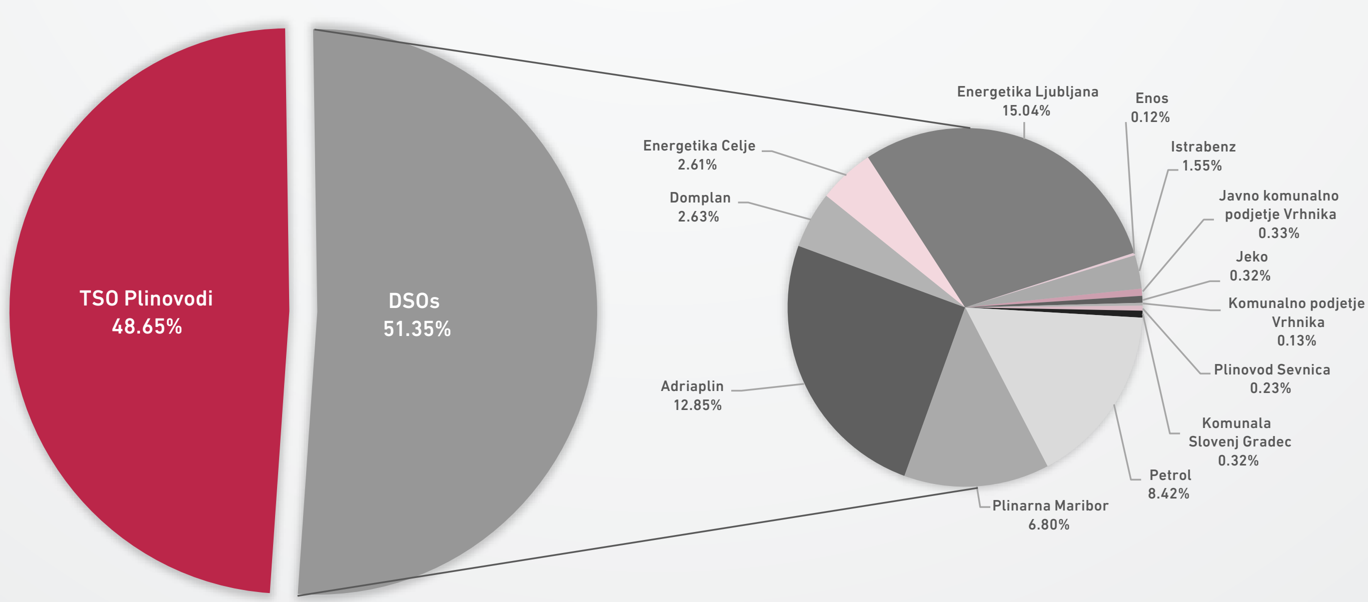


SOURCE: ENERGY AGENCY

The year 2022 was therefore the first year of the 2022–2024 regulatory period. For 2022, the distribution system operators planned eligible costs of EUR 51.4 million and the transmission system operator EUR 48.7 million. Figure 201 shows the structure of the planned eligible costs in 2022 for the activities of the system operators.

The largest share of the eligible costs of the transmission and distribution system operators is allocated to operation and maintenance costs

FIGURE 201: THE STRUCTURE OF THE PLANNED ELIGIBLE COSTS OF SYSTEM OPERATORS FOR 2022



SOURCE: ENERGY AGENCY

The Network Charge for the Natural Gas Transmission System

The network charge for the natural gas transmission system is levied on transmission system users and consists of:

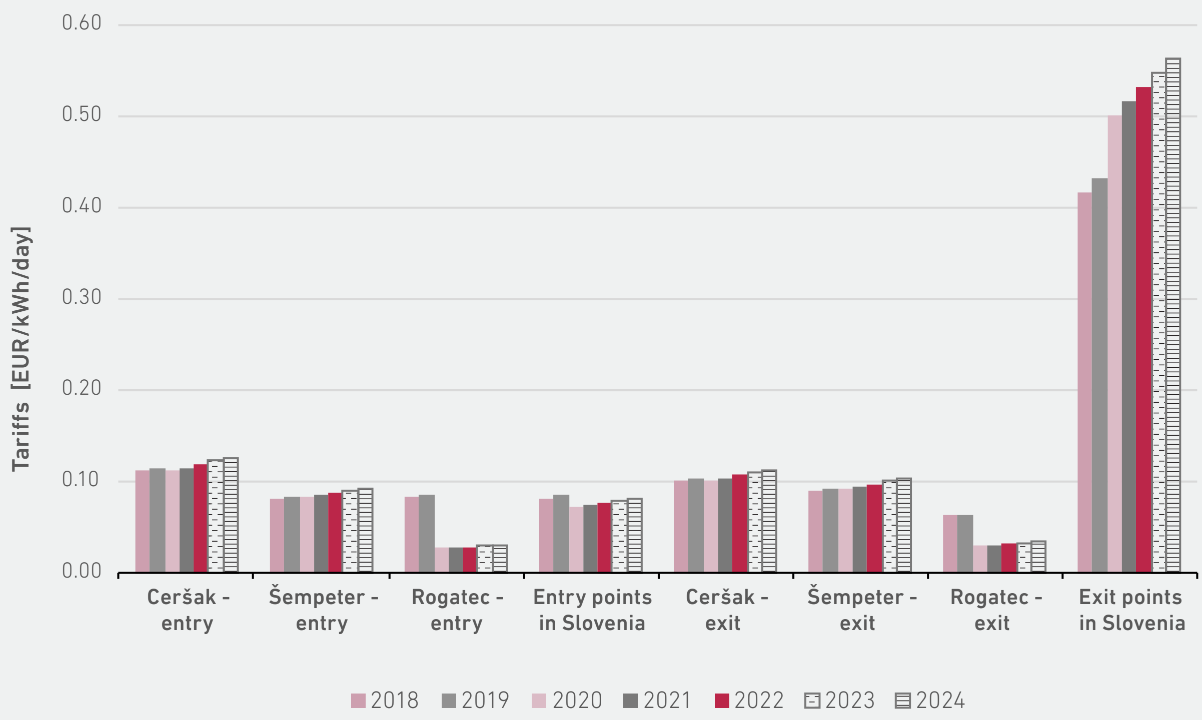
- network charge for the entry point,
- network charge for the exit point,
- network charge for own use; and
- network charge for measurements.

The network charge for each entry/exit point depends on the capacity product and booked capacity. Transmission system users book the capacity of the entry/exit points that are interconnection points or border points via an online booking platform, as an annual, quarterly, monthly, daily or intraday standard capacity product.

System users leasing capacity within Slovenia may, however, lease annual, monthly or daily standard capacity product and day-ahead standard capacity product. For these users, the network charge for the intra-Slovenian exit point until 2024 will also be determined based on their classification into a consumption group according to the level of the capacity booked.

Transmission system users who book capacity are charged the network charge for their own use and the network charge for measurements. The network charge for own use depends on the amount of natural gas transferred at each exit point, and the network charge for measurements depends on the size of the measuring device and the number of pressure reductions.

FIGURE 202: MOVEMENT OF THE NETWORK CHARGE TARIFFS FOR THE ENTRY AND EXIT POINTS OF THE TRANSMISSION SYSTEM DURING THE 2018–2024 PERIOD



SOURCE: ENERGY AGENCY

The network charge tariffs for 2022 were set by the TSO in the context of the determination of the 2022–2024 regulatory period.

The network charge tariffs increased by 2.9% in 2022 compared to 2021.

Network Charges for the Natural Gas Distribution Systems

The network charge for the natural gas distribution system consists of a distribution network charge and a network charge for measurements.

The network charge tariffs are determined uniformly by the distribution system operator for all the areas where it distributes natural gas. Only in specific cases may network charge tariffs be different for different areas of service.

The network charge for distribution is paid by the users of the distribution system according to the quantity of natural gas distributed, which forms the variable part of the distribution tariff, and according to the booked capacity, which reflects the fixed part of the network charge. In the case of smaller consumers, this is calculated as a monthly flat-rate fee and for larger consumers as the amount of connected power or booked capacity.

The network charge for metering depends on the size and type of the measuring device and the ownership or management of that device.

The 2022 network charge tariffs were set in 2021, when the consents to the 2022–2024 regulatory framework were issued. In 86 municipalities, 16 Acts setting the network charge tariffs for the distribution network were applied for the calculation of the network charge.

Distribution system operators are required to show the amount for the distribution of natural gas separately on the distribution system user's bill from the amount for metering.

Network charges for the majority of consumers in distribution systems remained at the level of the previous two years

The annual amounts of the network charges paid by consumers with an estimated annual consumption of up to 50,000 kWh, which is just under 96% of all consumers in distribution systems, have not changed significantly for most consumers in 2022 compared to 2021 and 2020.

The movement of the network charge for distribution per megawatt-hour of natural gas consumed for typical household consumers and medium-sized industrial consumers in each year of the 2018–2022 period for the seven operators distributing natural gas in the 10 largest municipalities by number of consumers is shown in the following figures. These operators are responsible for distribution in 69 other municipalities, which means that the network charges shown apply to 81 geographical areas in 79 municipalities out of a total of 86, and to just under 97% of all the consumers in distribution.

For typical smaller household consumers (group D1 with an annual consumption of 3,765 kWh), the network charge increased compared to the previous year in three geographic areas, consumers paid the same amount as the previous year in 32 geographic areas, and the network charge decreased in 46 geographic areas by between 0.3% and 4.3%.

For average household consumers (group D2 with an annual consumption of 10 MWh), the network charge increased in 12 geographic areas, remained unchanged in 32 geographic areas compared to 2021 and was between 0.7% and 4.4% lower in 37 geographic areas compared to the previous year.

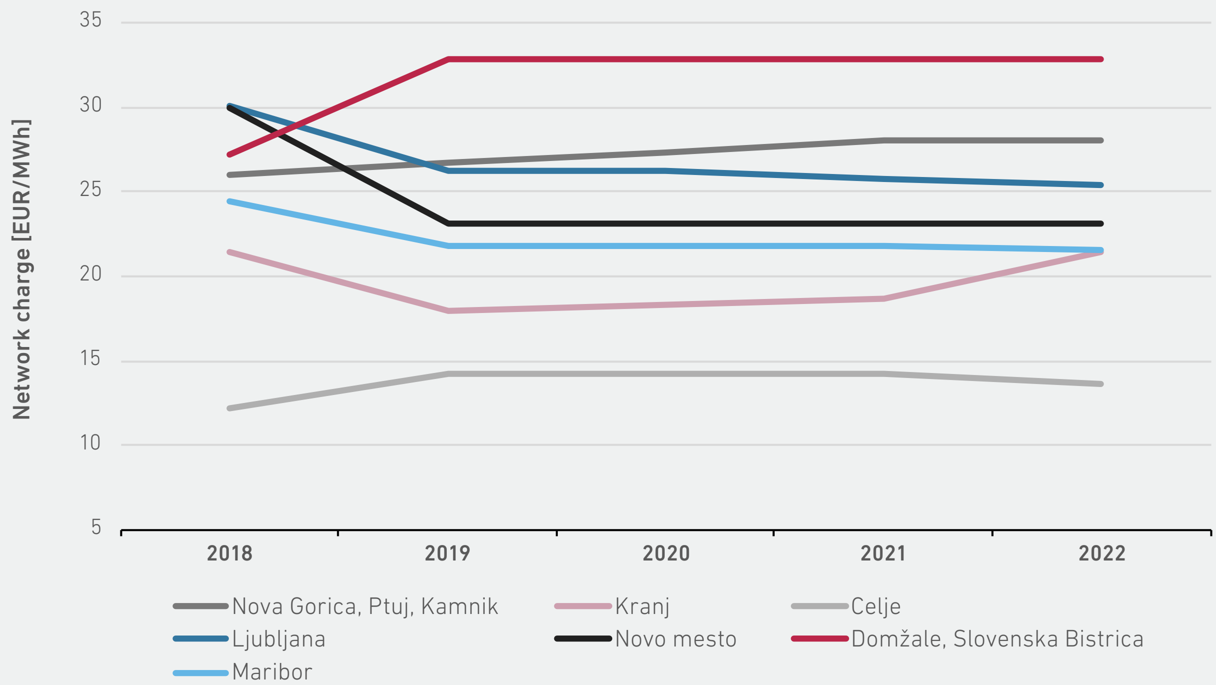
For medium-sized household consumers (group D2 with an annual consumption of 32 MWh), the network charge increased in 12 geographic areas, remained unchanged in 59 areas and decreased in 10 areas, ranging from 1.5% to 5.1%.

For large residential consumers (group D3 with an annual consumption of 215 MWh), the annual amount of the network charge in 2022 increased by 10.9% in three geographic areas compared to the previous year, remained unchanged in 59 areas, and decreased in 19 geographic areas by between 1.7% and 8.3%.

The average values of the changes in the annual network charge for a typical household consumer (group D1 with an annual consumption of 3,765 kWh) compared to 2021 range from –0.3% to +15%. For medium-sized household consumers (group D2 with an annual consumption of 10 MWh and D2 with an annual consumption of 32 MWh), the annual network charge amounts varied between –0.7 and +14.6% over the same period. For large household consumers (group D3 with an annual consumption of 215 MWh), the annual network charge varied between –8.3 and +10.5%.

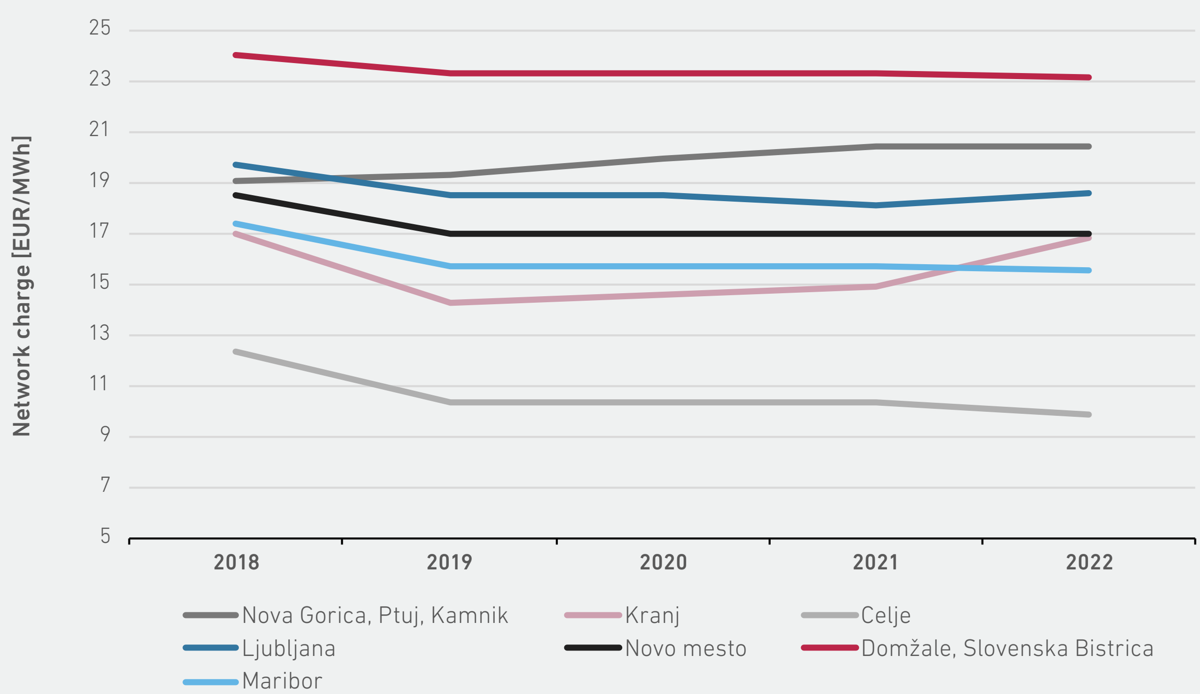
At individual DSOs, the annual network charge amounts were over 33% lower than five years ago. The greatest increase in the network charge between 2017 and 2022 was recorded at the Petrol DSO, namely for smaller consumers with an average annual consumption of 3,765 kWh. For these consumers, the maximum annual amount of the distribution network charge was EUR 124. The evolution of network charges over the 2018–2022 period is shown in Figures 203, 204, 205 and 206.

FIGURE 203: DISTRIBUTION NETWORK CHARGE MOVEMENT FOR SMALL HOUSEHOLD CONSUMERS – D1 (3,765 kWh) IN THE 2018–2022 PERIOD



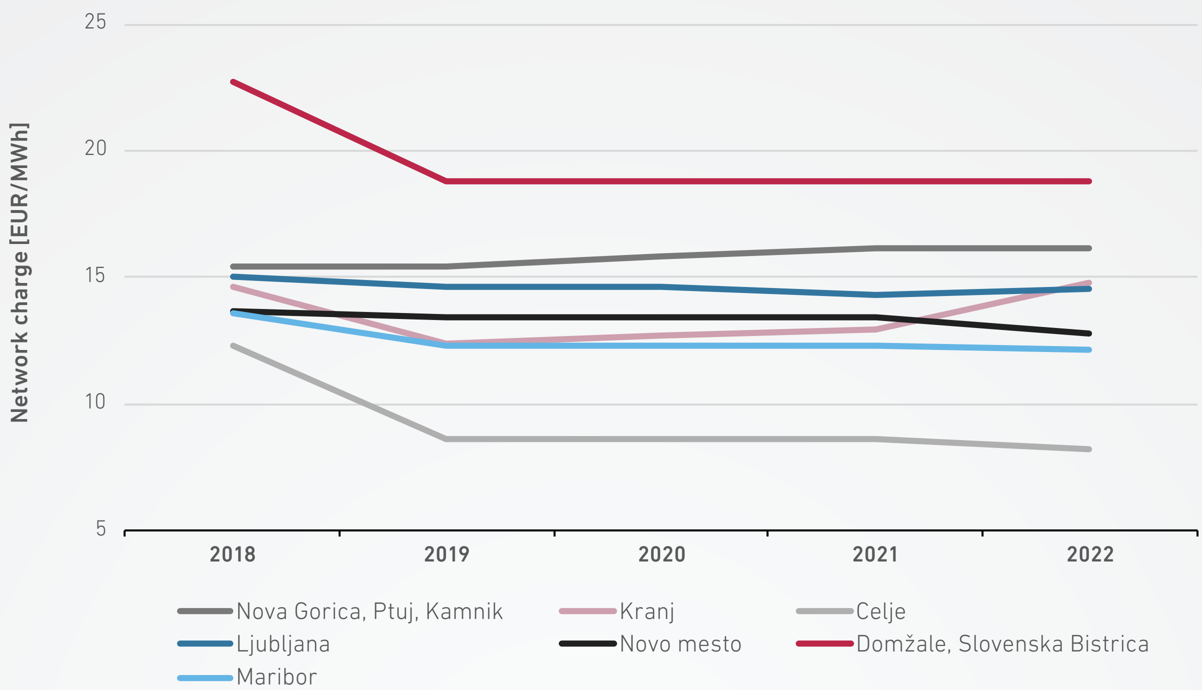
SOURCE: ENERGY AGENCY

FIGURE 204: DISTRIBUTION NETWORK CHARGE MOVEMENT FOR MEDIUM-SIZED HOUSEHOLD CONSUMERS – D2 (10 MWh) IN THE 2018–2022 PERIOD



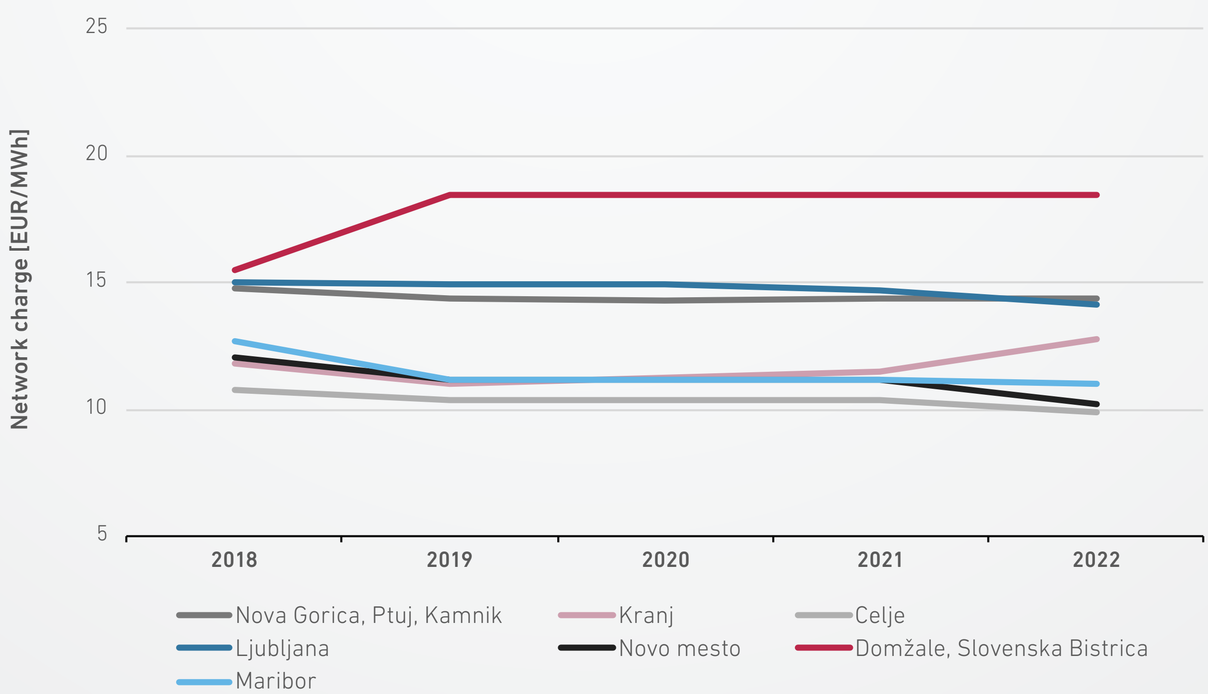
SOURCE: ENERGY AGENCY

FIGURE 205: DISTRIBUTION NETWORK CHARGE FOR MEDIUM-SIZED HOUSEHOLD CONSUMERS – D2 (32 MWh) IN THE 2018–2022 PERIOD



SOURCE: ENERGY AGENCY

FIGURE 206: DISTRIBUTION NETWORK CHARGE FOR LARGE HOUSEHOLD CONSUMERS – D3 (215 MWh) IN THE 2018–2022 PERIOD



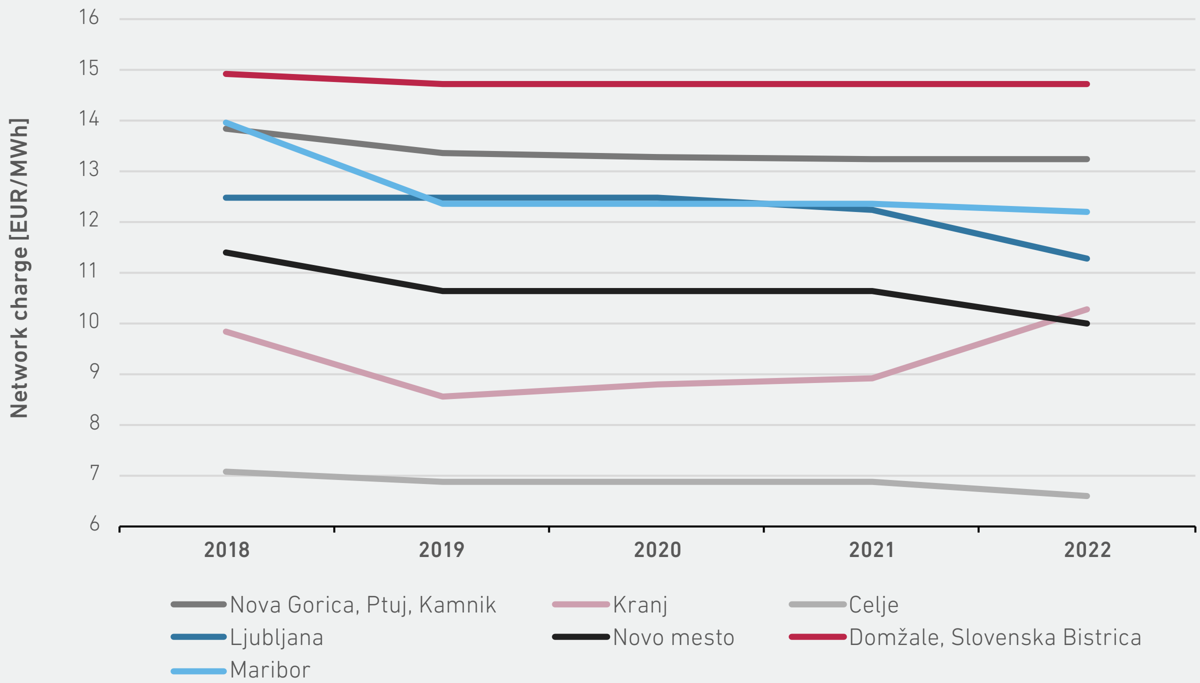
SOURCE: ENERGY AGENCY

For medium-sized industrial consumers (group I3 with an annual consumption of 8,608 MWh), the average annual network charge increased by 15% compared to the previous year in three geographic areas, consumers paid the same as the previous year in 59 areas, and the network charge decreased by between 1.3% and 7.8% in the remaining 19 areas.

Most medium-sized industrial consumers paid equal or lower network charges in 2022

The average annual change in network charges for these consumers over the last five years varied between −2% and +1.5% depending on the operator. At five operators, consumers were paying lower network charges than five years ago. The differences in the annual network charge in individual municipalities reflect the different structures of consumers and their consumption, as well as the age and size of the distribution systems. The evolution of network charges for medium-sized industrial customers over the 2018–2022 period is shown in Figure 207.

FIGURE 207: DISTRIBUTION NETWORK CHARGE MOVEMENT FOR MEDIUM-SIZED INDUSTRIAL CONSUMERS – I3 (8,608 MWh) IN THE 2018–2022 PERIOD



SOURCE: ENERGY AGENCY

Capacity at Border Points

Capacities at border points were allocated on the basis of market-based methods through the online reservation platform PRISMA. Auctions have been carried out of firm and interruptible capacities. There were 61,808 auctions published. Individual and bundled capacities were offered at auctions. The number of successful auctions of firm capacity was 1,194, which is 24% more than in the previous year. Of all the auctions, 85% were bundled capacity auctions. There were also seven successful auctions of interruptible day-ahead capacity at the Šempeter border entry point. There were no auctions of incremental capacity in 2022.

TABLE 37: NUMBER OF SUCCESSFUL AUCTIONS OF FIRM CAPACITY

Auction type	Ceršak entry	Rogatec entry	Rogatec exit	Šempeter entry	Šempeter exit	Total
Annual	2	0	1	2	0	5
Quarterly	6	1	3	6	0	16
Monthly	19	6	10	5	0	40
Day-ahead	332	66	144	119	22	683
Intraday	233	32	82	52	51	450
Total	**592**	**105**	**240**	**184**	**73**	**1194**
Bundled	408	105	240	184	73	1010
Individual capacity	184	0	0	0	0	184

SOURCES: ENERGY AGENCY, PLINOVODI

The most significant increase in the number of auctions took place at the Šempeter entry point. This was due to the scarcity and uncertainty of supplies from the eastern supply route as a result of the war in Ukraine and the consequent shift of suppliers to gas sources from Italy and North Africa.

TABLE 38: COMPARISON OF SUCCESSFUL AUCTIONS OF FIRM CAPACITY AT THE ENTRY POINT ŠEMPETER IN 2021

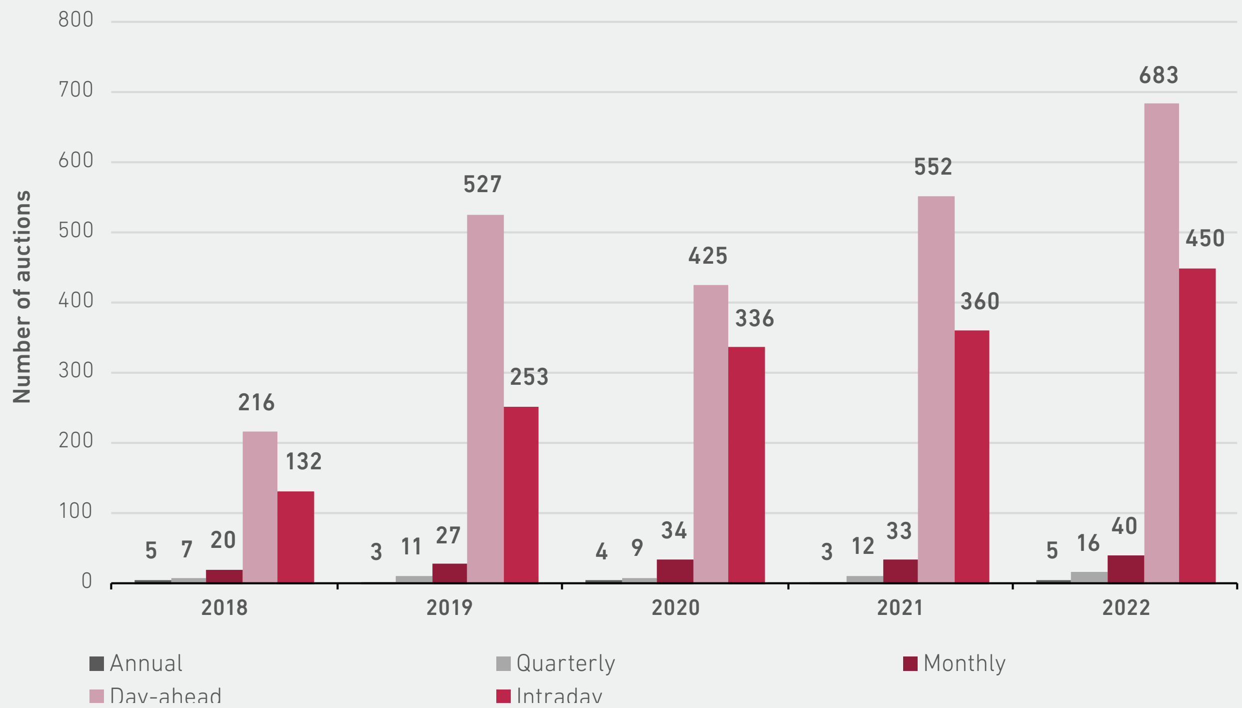
Auction type	2021	2022
Annual	0	2
Quarterly	0	6
Monthly	0	5
Day-ahead	1	119
Intraday	5	52
Total	**6**	**184**

SOURCES: ENERGY AGENCY, PLINOVODI

Figure 208 shows the auctions of firm transmission capacity held over the last five years. The most marked increase is in the number of day-ahead auctions, which account for 57% of all successfully conducted auctions of firm capacity in 2022. This is followed by intra-day capacity auctions with 38% of all the auctions, while monthly, quarterly and annual capacity auctions together account for only 5% of all the auctions. The trend in short-term capacity leasing is due to the expiry of long-term capacity leasing contracts in 2017, the increasing optimisation of capacity leasing and the high unpredictability of the natural gas market. In 2022, however, the energy crisis and the changed gas flows as a result of the tense geopolitical situation have also had an impact on the increased leasing of short-term capacity.

24% more successful auctions of day-ahead capacity

FIGURE 208: SUCCESSFUL AUCTIONS OF FIRM CAPACITY IN THE 2018–2022 PERIOD



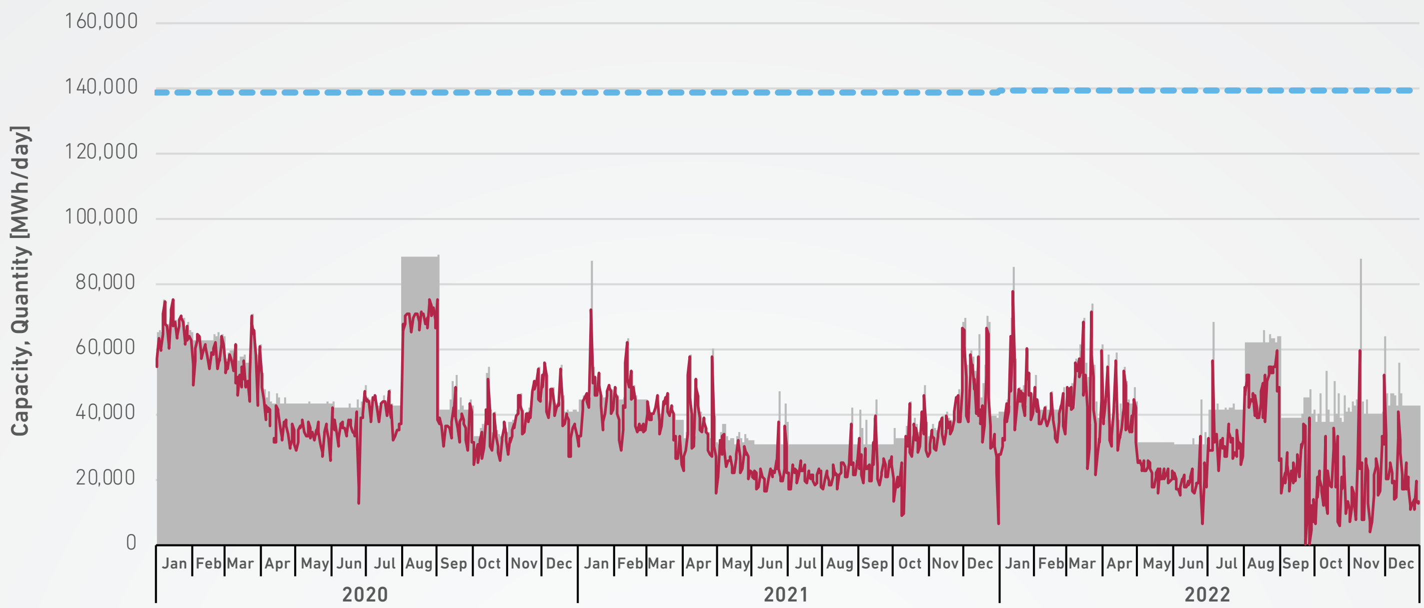
SOURCES: ENERGY AGENCY, PLINOVODI

The TSO carried out a market demand assessment in cooperation with neighbouring TSOs. This involved one non-binding request capacity booking at the Ceršak, Šempeter and Rogatec entry points, and the Šempeter and Rogatec exit points. The request was sent for capacity leasing between the gas years 2022/2023 and 2026/2027 in the range of 5,000 kWh/h to 1,000,000 kWh/h.

13% more booked capacity at Ceršak

The leasing of firm capacity at Ceršak, Slovenia's largest border entry point, increased by 13% compared to the previous year. There was no leasing of interruptible capacity. Despite the higher capacity purchases, the volumes transported were 5% lower compared to the previous year due to the diversion of gas flows.

FIGURE 209: DYNAMICS OF THE DAILY TRANSFERRED QUANTITIES OF NATURAL GAS, TECHNICAL CAPACITY, ALLOCATED FIRM AND INTERRUPTIBLE CAPACITY AT THE CERŠAK ENTRY POINT IN THE 2020–2022 PERIOD



SOURCES: ENERGY AGENCY, PLINOVODI

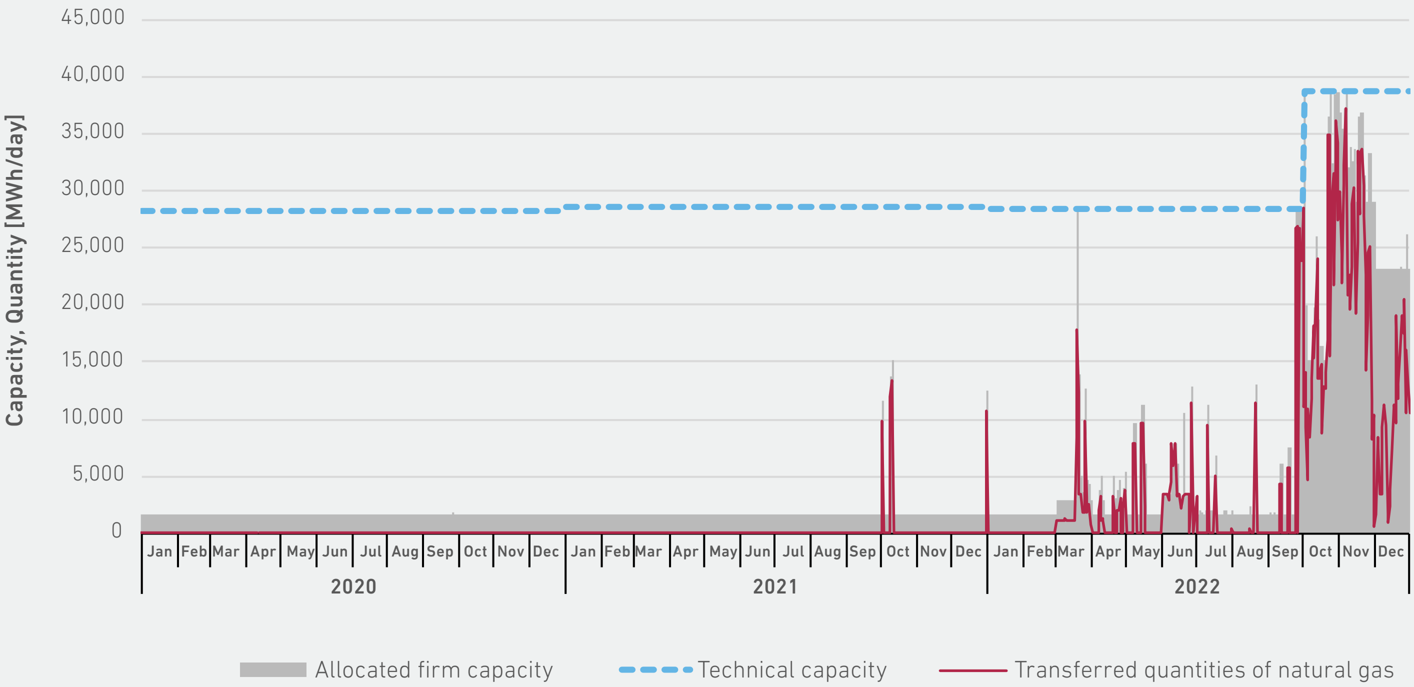
As there is no physical gas flow from Slovenia to Austria at Ceršak, gas flowed to Austria virtually in the form of gas swaps (swapping). 527 GWh of gas was swapped, which is nine times more than in 2021.

The Šempeter entry point was upgraded over the summer to provide a technical capacity of 39 GWh/day from 1 October 2022, an increase of 36% in technical capacity.

The upgrade of the entry point from Italy to Slovenia represents a 36% increase in technical capacity

In line with the increase in technical capacity, the start of the 2022/2023 gas year (1 October) has seen a significant increase in the leasing of transmission capacity, as some suppliers have also started to transmit gas from Italy to Slovenia for Slovenian customers.

FIGURE 210: DYNAMICS OF THE DAILY TRANSFERRED QUANTITIES OF NATURAL GAS, TECHNICAL CAPACITY, ALLOCATED FIRM AND INTERRUPTIBLE CAPACITY AT THE ŠEMPTER ENTRY POINT IN THE 2020–2022 PERIOD



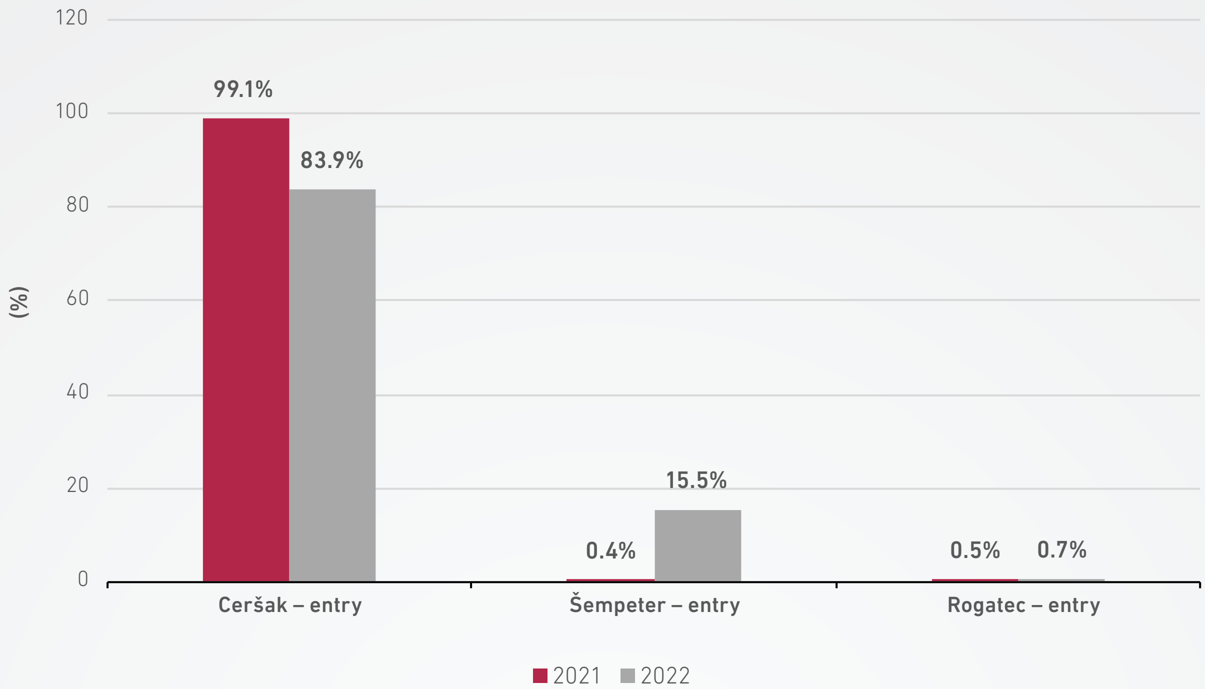
SOURCES: ENERGY AGENCY, PLINOVODI

In the last quarter of 2022, the importance of having more entry points into the Slovenian transmission system with sufficient capacity was demonstrated as on some days, the gas flow through the Šempeter entry point reached up to 80% of the daily volumes transported into Slovenia.

In 2021 and almost three quarters of 2022, the average daily gas flow through the Ceršak entry point would be almost 100% of the total daily entry volumes into Slovenia. However, at the expense of the last quarter of 2022, the average daily gas flow through the Šempeter entry point has risen to 15.5% on an annual basis.

15% of the annual gas quantities, and on 30 September as much as 80% of the daily volumes were transferred to Slovenia at the Šempeter entry point

FIGURE 211: AVERAGE DAILY GAS TRANSFER AT THE ENTRY POINTS TO SLOVENIA IN 2021 AND 2022



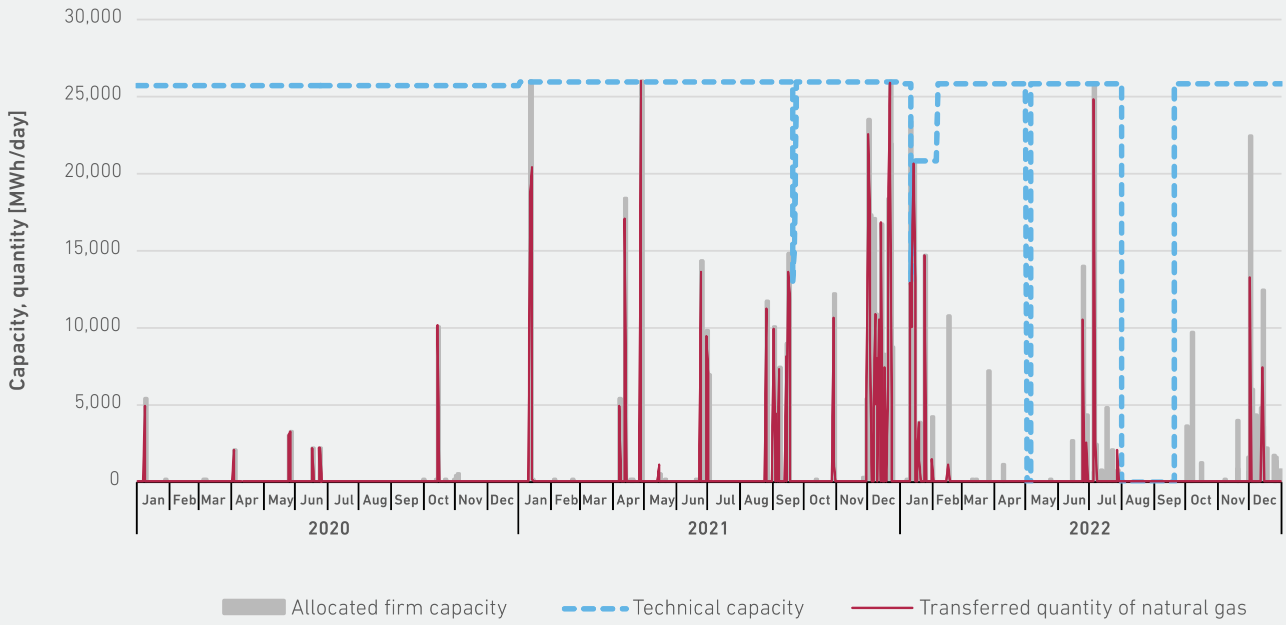
SOURCES: ENERGY AGENCY, PLINOVODI

In the coming years, new supply contracts with Algeria and the increasing volumes of gas from Russia are expected to further increase gas flows through the Šempeter entry point.

At the Šempeter exit point, where there is no long-term leased capacity, capacity has only been leased on individual days, with the highest volumes in January and December. The average annual leasing of transmission capacity was only 3.7% of the technical capacity. 156 GWh of gas was transported to Italy. There was no leasing of interruptible capacity.

Due to necessary maintenance work at the Ajdovščina compressor station, the technical capacity at this exit point was reduced at the beginning of the year. Similarly, from the beginning of August until mid-September, there was a complete reduction of the guaranteed transmission capacity. During this period, the TSO offered interruptible capacity.

FIGURE 212: DYNAMICS OF THE DAILY TRANSFERRED QUANTITIES OF NATURAL GAS, TECHNICAL CAPACITY, ALLOCATED FIRM AND INTERRUPTIBLE CAPACITY AT THE ŠEMPETER EXIT POINT IN THE 2020–2022 PERIOD

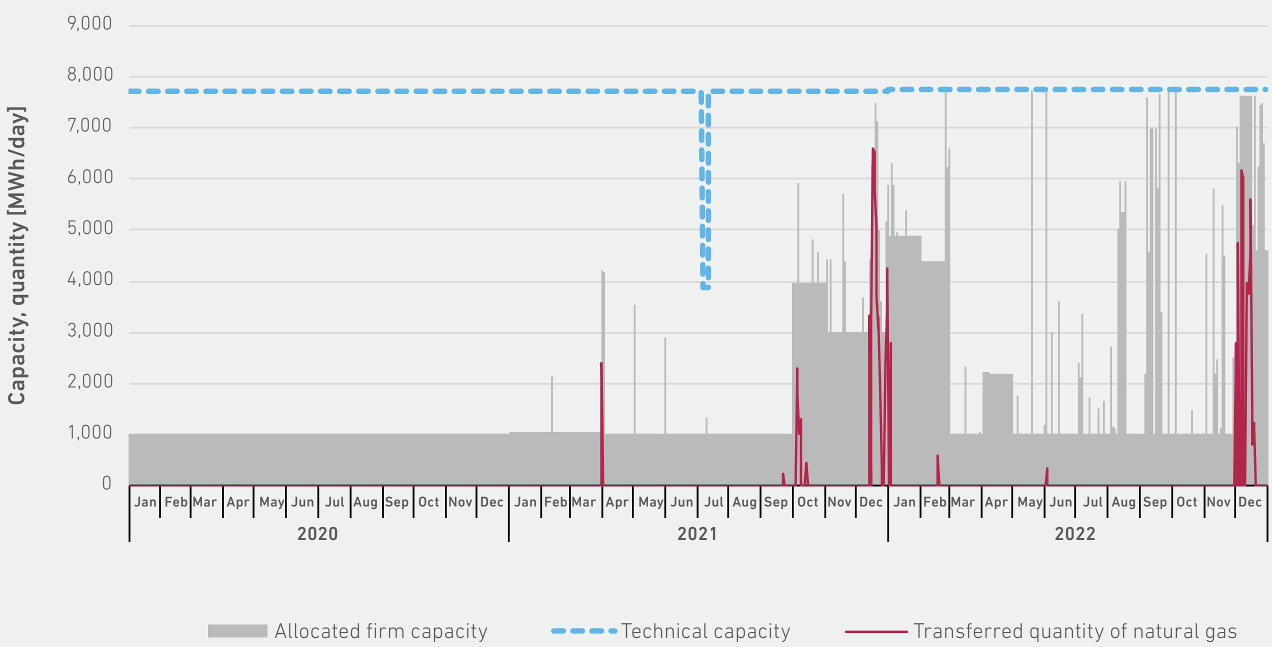


SOURCES: ENERGY AGENCY, PLINOVODI

At the Rogatec entry point, the transmission capacity was only leased to a greater extent during the winter months. On an annual basis, the leasing of transmission capacity averaged 34% of the technical capacity, an increase of 11 percentage points compared to the previous year. As the technical capacity of the Rogatec entry point is only 7.7 GWh/day, both contractual and physical congestion can occur quickly in case of gas import needs from Croatia. In 2022, at least 95% of the technical capacity was leased for 22 days.

Physical gas flows were significantly lower than the contracted capacity, with the highest number in December. Virtual gas flows from Croatia to Slovenia in the form of gas swaps were four times more than physical flows. There were no leases of interruptible capacity.

FIGURE 213: DYNAMICS OF THE DAILY TRANSFERRED QUANTITIES OF NATURAL GAS, TECHNICAL CAPACITY, ALLOCATED FIRM AND INTERRUPTIBLE CAPACITY AT THE ROGATEC ENTRY POINT IN THE 2020–2022 PERIOD



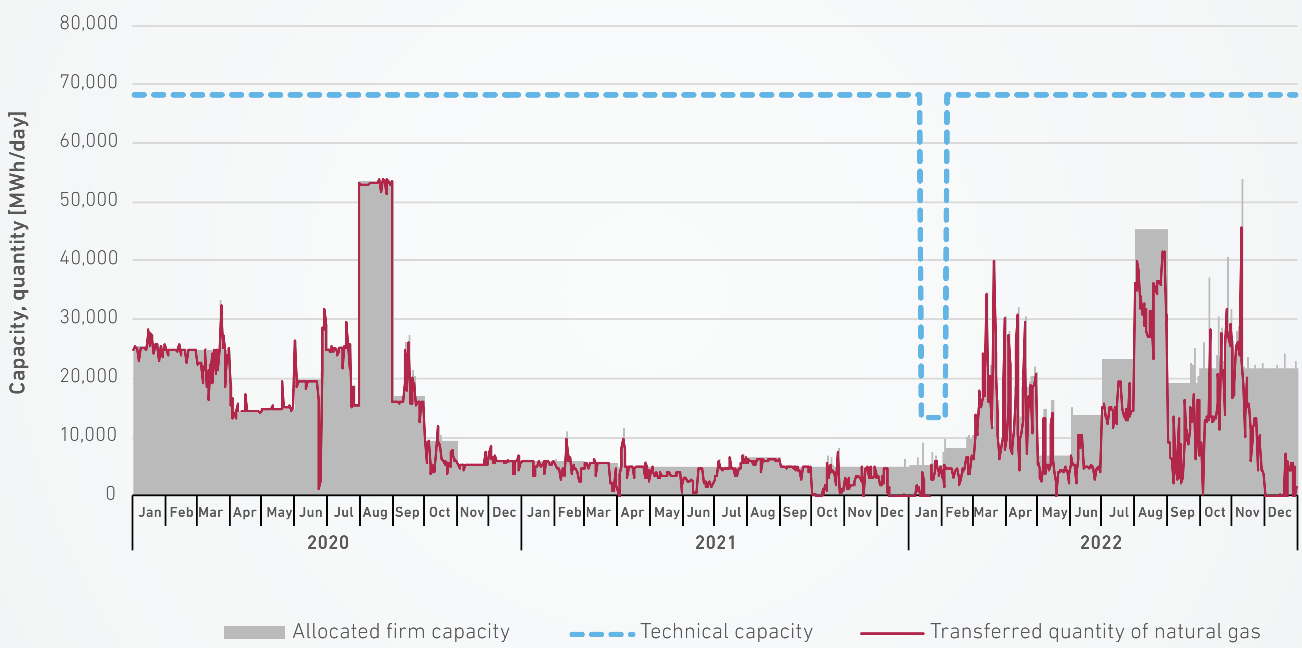
SOURCES: ENERGY AGENCY, PLINOVODI

At Rogatec, the largest exit point, 3.6 times more transmission capacity was leased than the previous year. On average, 30% of the technical capacity was leased. In line with the higher leasing of transmission capacity, the quantities transferred were also three times higher compared to the previous year, amounting to 4,327 GWh. There was no leasing of interruptible capacity.

Maintenance work at the Kidričevo compressor station resulted in a 25-day reduction in the technical capacity to one-fifth of the nominal technical capacity at the beginning of the year.

Three times more gas transferred from Slovenia to Croatia than the year before

FIGURE 214: DYNAMICS OF THE DAILY TRANSFERRED QUANTITIES OF NATURAL GAS, TECHNICAL CAPACITY, ALLOCATED FIRM AND INTERRUPTIBLE CAPACITY AT THE ROGATEC EXIT POINT IN THE 2020–2022 PERIOD

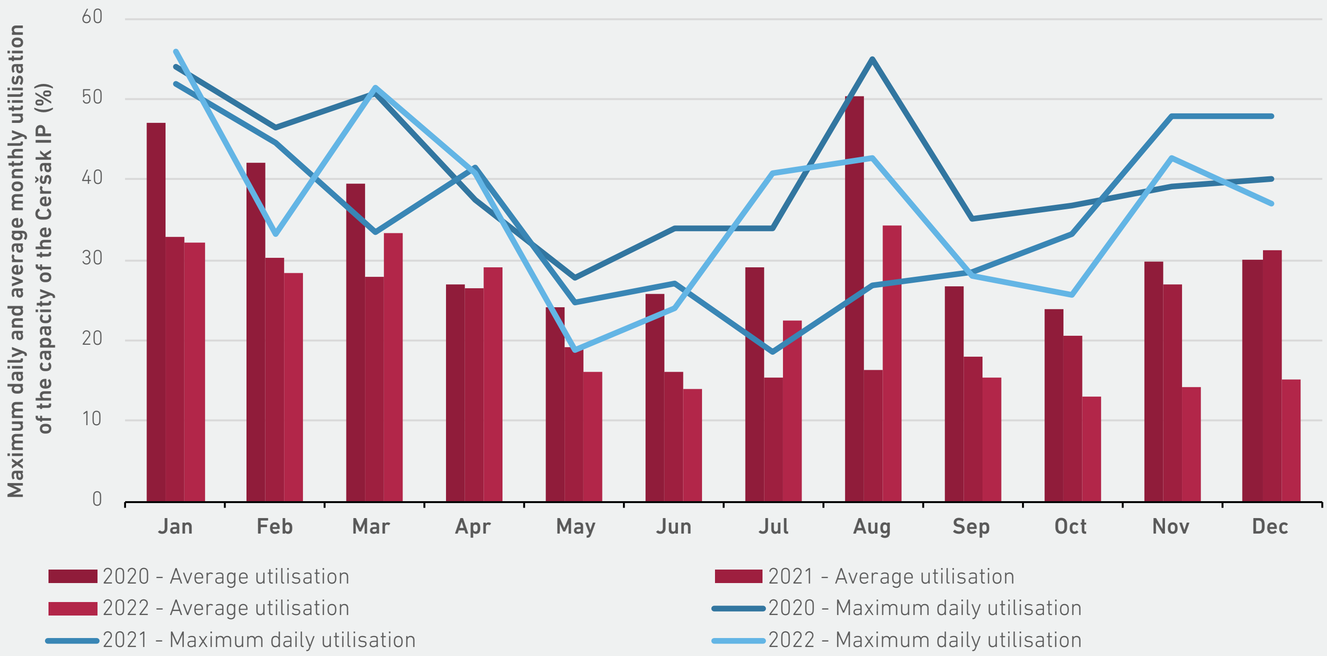


SOURCES: ENERGY AGENCY, PLINOVODI

The highest average monthly occupancy rate of the technical capacity of the Ceršak entry point was reached in August (34%) and the lowest in October (13%). The higher flows in the summer months are due to the filling of warehouses in Croatia. The highest daily utilisation of the technical capacity, 56%, was reached in January.

The average monthly occupancy rate of the technical capacity at the Ceršak entry point was 22%, one percentage point lower than a year earlier.

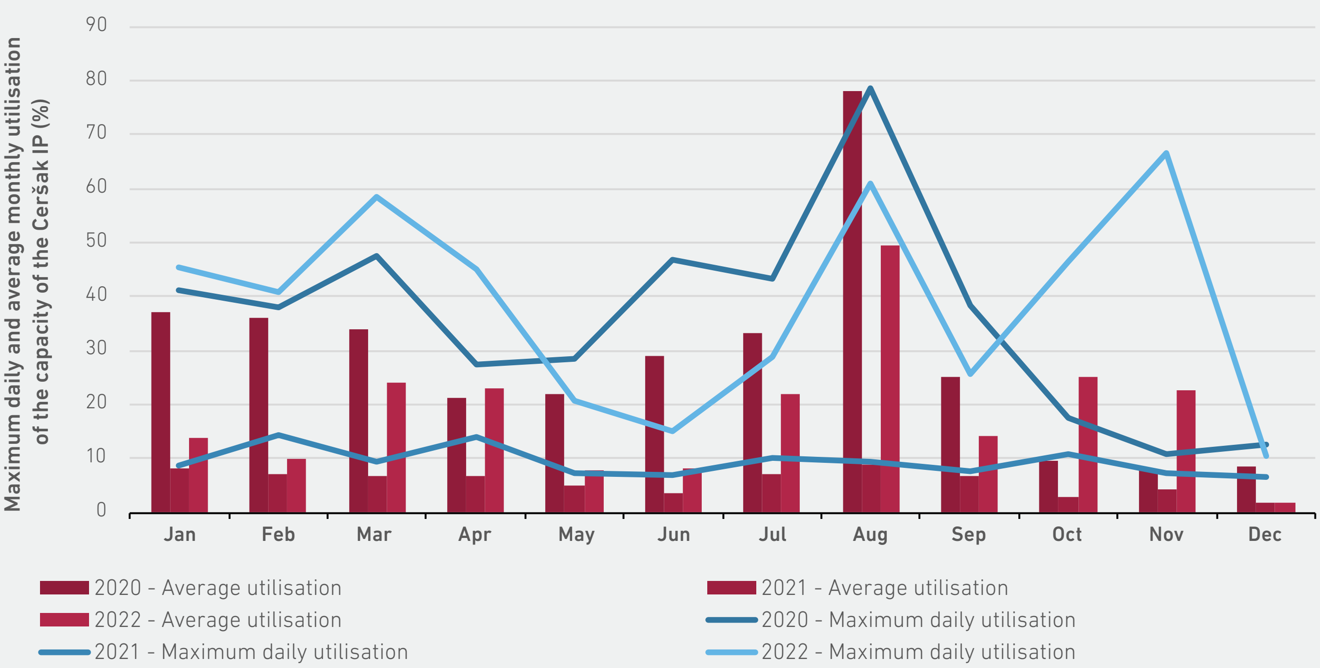
FIGURE 215: MAXIMUM DAILY AND AVERAGE MONTHLY UTILISATION OF THE CAPACITY OF THE CERŠAK BORDER ENTRY POINT IN THE 2020–2022 PERIOD



SOURCES: ENERGY AGENCY, PLINOVODI

The maximum daily utilisation of the technical capacity of the Rogatec exit point was 67%, almost five times more than the year before. It was achieved in November. The average monthly technical capacity utilisation rate was also significantly higher – at 18%, it was three times higher than the previous year. The highest average monthly technical capacity utilisation rate was 49%, achieved in August.

FIGURE 216: MAXIMUM DAILY AND AVERAGE MONTHLY UTILISATION OF THE CAPACITY OF THE ROGATEC BORDER EXIT POINT IN THE 2020–2022 PERIOD



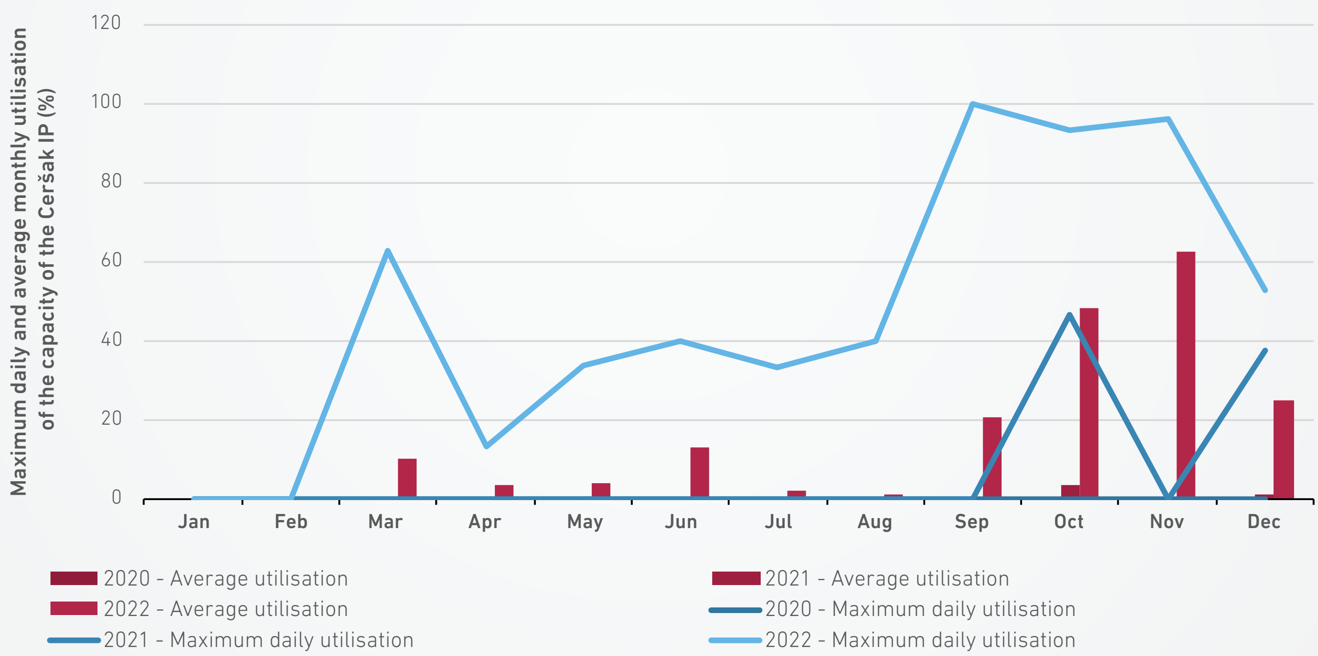
SOURCES: ENERGY AGENCY, PLINOVODI

The average utilisation of the technical capacity of the Šempeter entry point was 68% in the last quarter, compared to an average of only 13% in the first three quarters. In the last quarter, the average utilisation of the technical capacity was 45%, compared to an average of only 6% in the remaining months. In September, October and November, the entire technical capacity was leased for 13 days, which means that there was contractual congestion. Interruptible capacity was also contracted on seven occasions. On one day in September, there was also physical congestion and on eight days, the gas flows exceeded 90% of the technical capacity.

The significantly higher capacity leases and gas flows at this entry point are due to the high uncertainty and the gradual decrease of gas supplies of Russian origin in the eastern supply route. In October and November, on average, every second day, the gas flows from Italy were higher than the gas flows from Austria. It is evident that since the start of the war in Ukraine, the entry point at Šempeter has become increasingly important and capacity upgrades are already underway at this entry point.

Contractual and physical congestion at the Šempeter entry point

FIGURE 217: MAXIMUM DAILY AND AVERAGE MONTHLY UTILISATION OF THE CAPACITY OF THE ŠEMPETER BORDER ENTRY POINT IN THE 2020–2022 PERIOD



SOURCES: ENERGY AGENCY, PLINOVODI

Promoting Competition

The key results of the Energy Agency's ongoing market monitoring are presented below. The results cover the areas of pricing (weighting factors, price movements, the impact of liquidity on prices, etc.), the transparency and integrity of market functioning (e.g. access to price information, implementation of the Regulation on Wholesale Energy Market Integrity and Transparency) and market efficiency (openness and competition). The public publication of the results of market monitoring, in addition to other measures taken by the Energy Agency, contributes to enhancing market competitiveness and transparency and to ensuring quality energy supply services at an optimal price. The key indicators used to assess the competitiveness, transparency and integrity of the markets concerned are highlighted below.

Wholesale Market

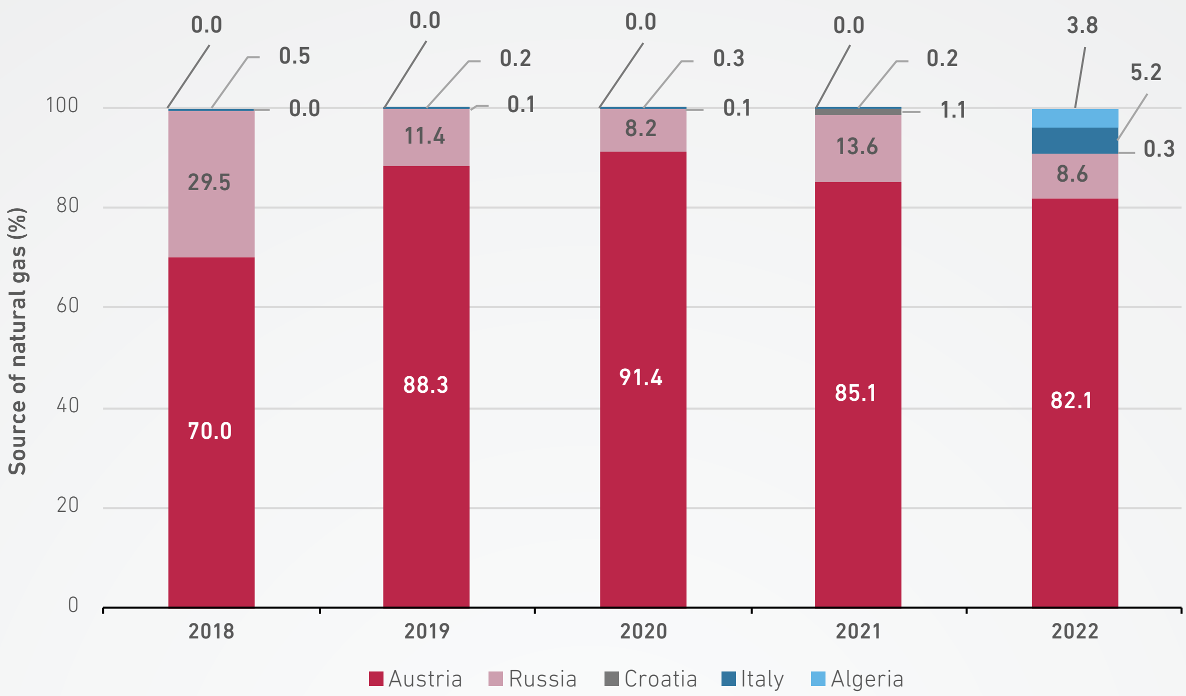
This chapter focuses on the assessment of market performance based on selected indicators that show the level of competition and the functioning of the natural gas market. The scope of the indicators is adapted to the size, structure and stage of development of the Slovenian natural gas market. Import dependency is certainly a specific feature and therefore, in addition to the national market, it is necessary to monitor the foreign markets from which the largest volumes of natural gas are supplied to Slovenia.

Resumed gas supplies from Italy and Algeria

Slovenia does not have its own natural gas sources, natural gas storage facilities or LNG terminals, and the Slovenian wholesale market is therefore exclusively supplied by gas imported from neighbouring countries via the transmission systems of traders. The Slovenian wholesale market is mainly supplied with gas from Austria, Russia, Croatia and Italy. However, Figure 218 shows that gas imports from Algeria resumed in 2022. Among these options, Slovenian traders/suppliers still make the most use of the connection to Austria, where the gas hub in Baumgarten and the Austrian storage facilities are also where the largest volumes of gas are obtained. In 2022, 82.1% of the total natural gas imports came from Austria. The remainder was imported from Russia, Italy and Algeria, while transmission from Croatia accounted for only 0.3% of the total imports, partly due to the low transmission capacity at the Rogatec border crossing point. Thus, gas imports from Italy and Algeria resumed in 2022. Imports from Italy increased by 5 percentage points, while imports from Algeria increased by 3.8% after a prolonged interruption of imports.

In recent years, Slovenia has been highly dependent on natural gas from Russia for its energy needs. While the Agency monitors the amount of natural gas imported for domestic consumption, it does not track the source of the gas to production. Slovenian traders/suppliers do indeed purchase the vast majority of their natural gas at the gas hub in Austria, but it is known that this hub is dominated by gas arriving from Russia. Slovenian dependence on Russian gas is therefore higher than that shown in Figure 219. This figure does not show the geographical origin of the natural gas, but rather the country from which the traders/suppliers have imported natural gas into Slovenia.

FIGURE 218: SOURCES OF NATURAL GAS IN THE 2018–2022 PERIOD



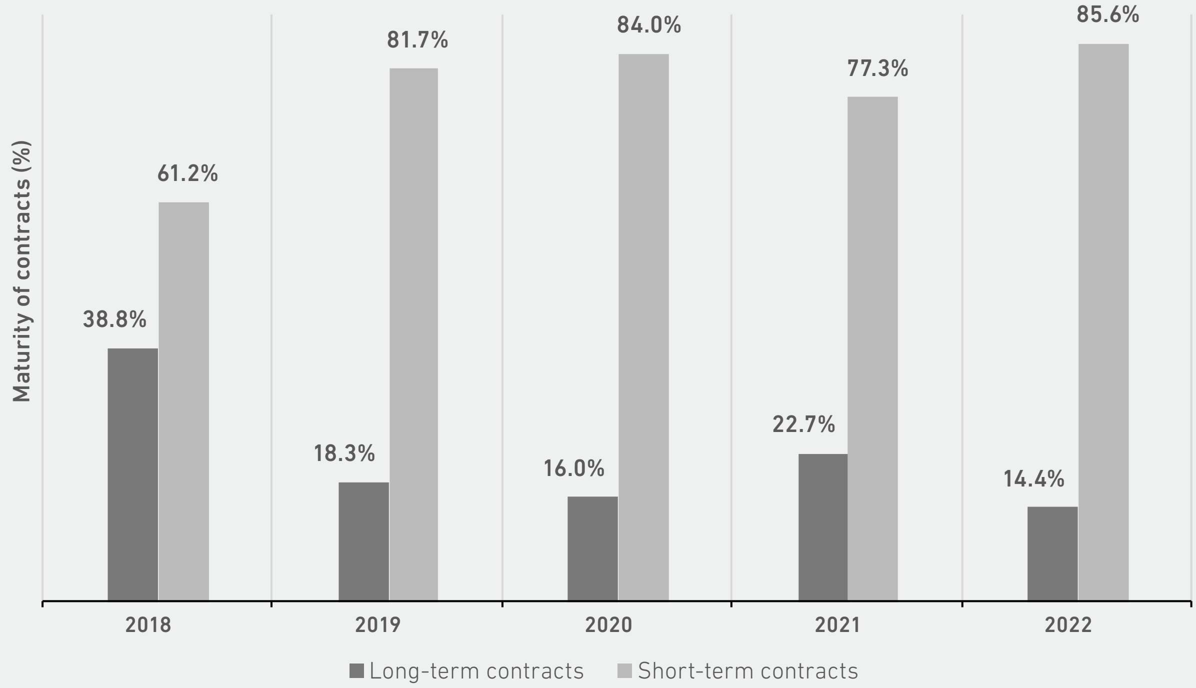
SOURCE: ENERGY AGENCY

A record amount of natural gas from short-term contracts

Market liberalisation has led to a decrease in the number of long-term contracts, which were typically concluded directly with natural gas producers in Russia. They were replaced by short-term contracts concluded at gas hubs, exchanges and other points within the EU. The dynamics of the increase in the conclusion of short-term contracts for the purchase of natural gas can be seen in Figure 221. In 2022, almost 86% of this energy product was purchased with short-term contracts with a maturity of less than one year. Due to the uncertain market conditions and high prices, traders or suppliers have not entered into long-term contracts for the purchase of natural gas. They focused on contracts with shorter delivery periods. Speculation on the market pushed the prices of so-called long-term products to record highs and made it unwise to buy large volumes of natural gas several years in advance.

Of course, the maturity of contracts, or the ratio of short-term to long-term contracts, can have an impact on the security of supply. Therefore, Geoplin has agreed to sign a long-term gas supply contract from Algeria in 2022. The Algerian supplier will provide Slovenia with gas for three years, covering around one-third of Slovenia's annual consumption.

FIGURE 219: STRUCTURE OF IMPORTED GAS IN RELATION TO THE MATURITY OF CONTRACTS



SOURCE: ENERGY AGENCY

The quantities of natural gas traded on the Slovenian wholesale market only include those sold by suppliers to other traders or suppliers. They exclude quantities imported to supply customers on the retail market when the supplier on the retail market is also the importer of natural gas. This methodology can be used to determine the market shares and the Herfindahl-Hirschman Index (HHI) of the Slovenian wholesale market. The calculated values are presented in Table 39. The Geoplin company again had the largest market share in 2022, while Petrol retained the second largest market share. Taking the retail market shares into account, it can be seen that the largest retail suppliers continue to source their natural gas independently on foreign markets, while smaller suppliers purchase from larger suppliers. Market concentration, as measured by the HHI, shows a very high degree of concentration in the Slovenian wholesale market. The value of the index still far exceeds the threshold that demarcates medium from high levels of concentration. The HHI was 6,109 in 2021 and 6,159 in 2022.

TABLE 39: MARKET SHARES AND THE HHI OF THE WHOLESALE NATURAL GAS MARKET

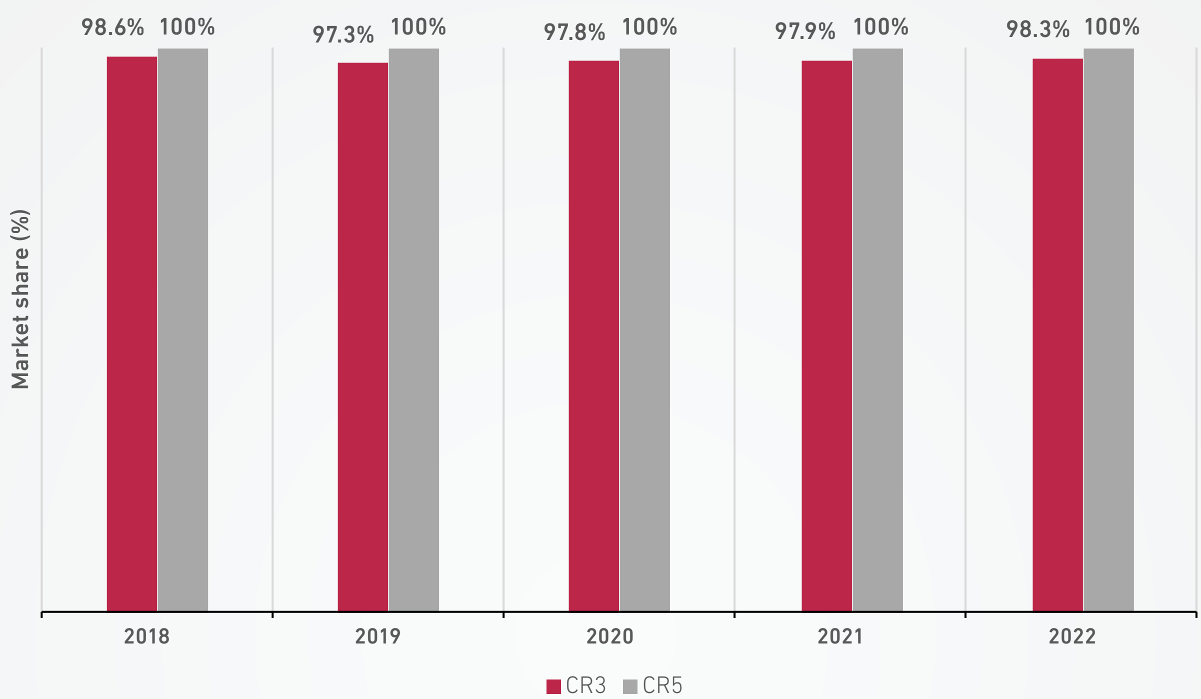
Company	**Market share**
Geoplin	75.96%
Petrol	19.45%
Energetika Ljubljana	2.86%
Plinarna Maribor	1.60%
Adriaplin	0.08%
Elektro energija	0.04%
Total	100%[159]
HHI of the wholesale market	**6,159**

SOURCE: ENERGY AGENCY

159 The difference between the total and the sum of the suppliers' market shares is the result of rounding to two decimal places

The high level of concentration is also shown by the CR3 and CR5 indices shown in Figure 220. The CR3 index gives the three largest market shares and the CR5 index of the five largest suppliers. The three largest suppliers controlled 98.3% of the wholesale market in 2021, while the five largest suppliers controlled the entire Slovenian market. The concentration has remained virtually unchanged over the last five years.

FIGURE 220: WHOLESALE NATURAL GAS MARKET CONCENTRATION



SOURCE: ENERGY AGENCY

Market Transparency

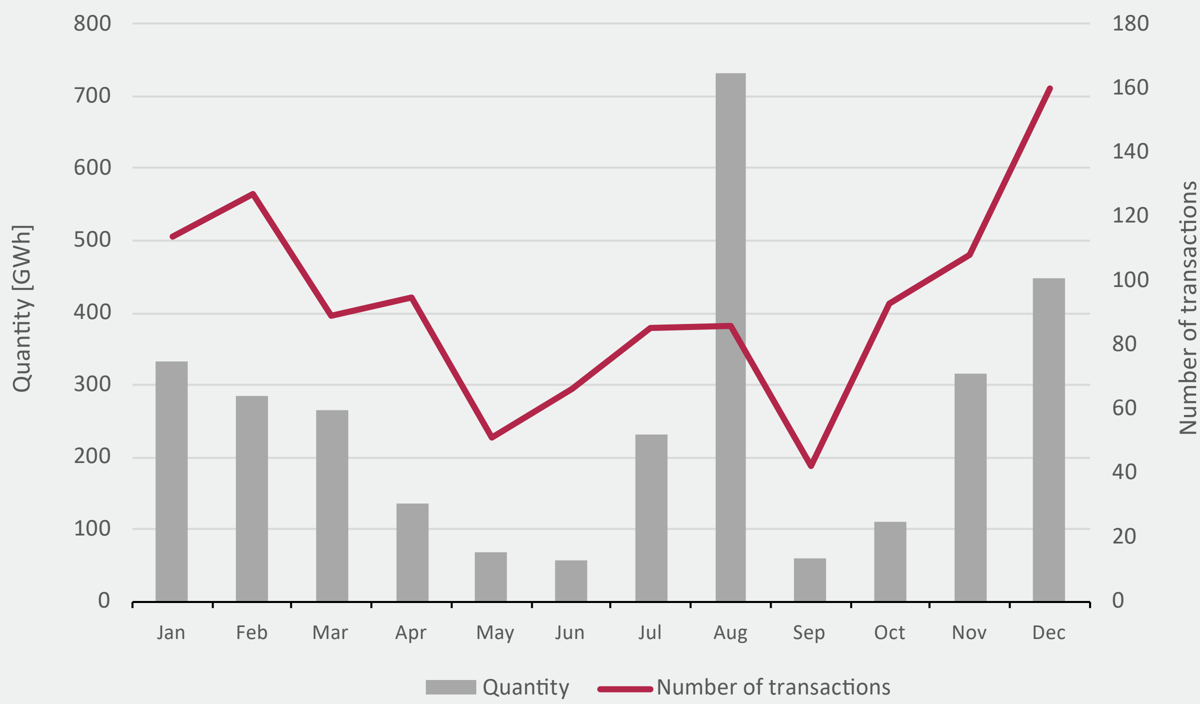
The REMIT regulation, Implementing Regulation 1348/2014, and the EA-1 provide a comprehensive legal framework to ensure price transparency on the natural gas and electricity wholesale market. This subject is addressed in more detail in the chapter about electricity market transparency.

Market Effectiveness

Below, the results of the monitoring of the virtual point operated by Plinovodi are presented. The virtual point is used for the execution of natural gas transactions, the operation of the trading platform for the imbalance settlement of the balancing group leaders, and the provision of bulletin board services.

As can be seen in Figure Figure 221, the number of transactions on the free market in 2022 followed the usual pattern, and the volume exchanges were again strongly subject to seasonal fluctuations except in August when the maximum average monthly utilisation of capacity of the Rogatec exit point was reached. Trading on the free market continues to be very popular among the market participants, with record trading volumes reported each year recently. The year 2022 was again no exception in this respect. In December 2021, the maximum exchanged quantity was 269.5 GWh on a monthly basis, while a new high of 733.3 GWh on a monthly basis was reached, as already mentioned, in August 2022. A new record was also reached on an annual basis. In 2022, the total exchanged quantity amounted to 3,044.0 GWh, while the year before was 1,866.6 GWh, which means a 63.1% increase in quantities. The most popular trade continues to be the day-ahead trade, with 1,032 transactions made on the day-ahead product, 13 on the intraday product, and the remaining 71 on the monthly product. No transaction was carried out in 2022 with the weekly product, which was introduced together with the monthly product.

FIGURE 221: TRADING IN THE VIRTUAL POINT (FREE MARKET)



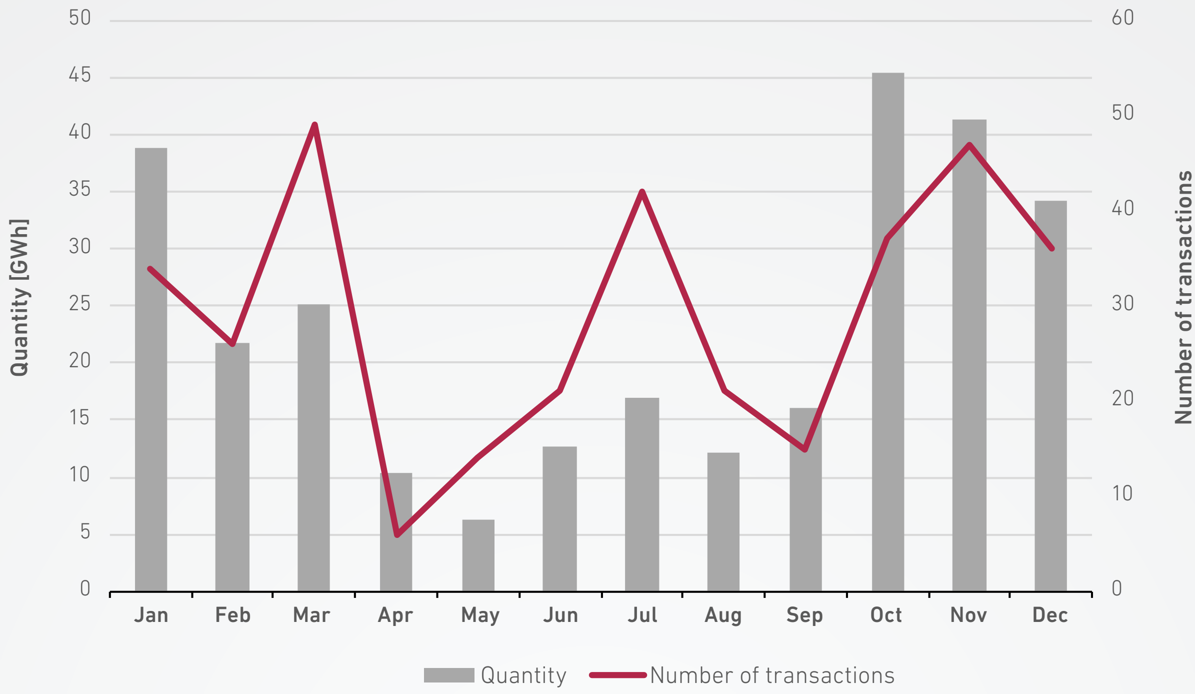
SOURCE: PLINOVODI

The virtual point also hosts a trading platform. This allows the balance group leaders to trade intraday and day-ahead natural gas volumes for balancing purposes. On the trading platform, the TSO trades natural gas volumes on an equal footing with other participants for the purpose of balancing the transmission system. If the operator cannot successfully balance the quantities in the transmission system by trading on the trading platform at the end of the billing day, it may use the system balancing service for balancing the transmission system based on an annual contract with the most favourable bidder.

The trades resulted in 281.3 GWh of natural gas being bought or sold on the trading platform. All 281.3 GWh were used by the operator to balance the transmission system, while no quantities were exchanged between balancing group leaders. These quantities were exchanged on the basis of 348 transactions, 266 of which were executed on the basis of a short-term intraday standardised product and 82 on the basis of a short-term day-ahead standardised product.

The quantities of natural gas exchanged and the number of trades executed on the trading platform in 2022 by month are shown in Figure 222.

FIGURE 222: TRADING ON A TRADING PLATFORM (BALANCING MARKET)



SOURCE: PLINOVODI

For each transaction executed on the trading platform, the price at which the natural gas was bought or sold is recorded. The index of the average price achieved on the trading platform is determined by balancing these prices with the quantities exchanged. The index is determined on a daily basis and is therefore comparable to the CEGHIX daily exchange index of the CEGH gas hub in Vienna. A comparison of the weighted average price and the CEGHIX is shown in Figure 223.

There is a strong correlation between the two indices as most of the natural gas is imported from Austria. On the trading platform, the liquidity level is lower, which is most pronounced on non-trading days. The weighted average price is shown in Figure 223 together with the CEGHIX stock index.

The natural gas price on the trading platform remains correlated with the CEGHIX stock index

FIGURE 223: WEIGHTED AVERAGE PRICE ON THE TRADING PLATFORM (BALANCING MARKET) AND VALUES OF THE CEGHIX

SOURCES: PLINOVODI, CEGH

In addition to the free trading and the trading platform, the virtual point includes a set of bulletin boards. This allows virtual point members to transparently post bids and ask for natural gas volumes in the Slovenian transmission system. Published offers do not contain prices. In 2022, offers for sale were published on 21 days of the year and requests for gas purchases on a total of 34 days. The average advertised offer capacity was 111,786 kWh/h and the average demand capacity was 107,426 kWh/h.

Retail Market

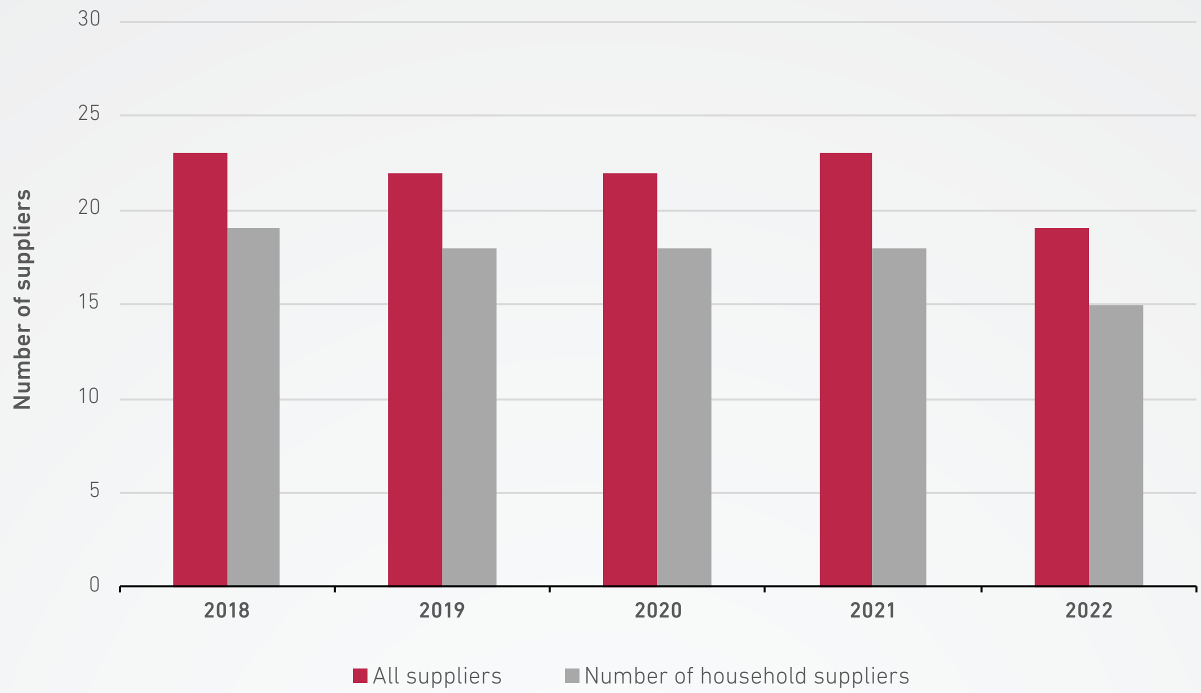
In 2022, 19[160] natural gas suppliers were active on the Slovenian retail market, supplying natural gas to household and business consumers connected to the distribution and transmission systems on the basis of concluded contracts. Of these, 15 suppliers purchased natural gas for household consumers. There were no new entries of suppliers in the retail market in 2022. As of 1 January, the supplier M Energetika, which only supplied natural gas to business consumers, ceased supplying. In the second half of 2022, three other suppliers, which supplied natural gas to business and household consumers, exited the retail market. E.ON ceased supplying on 1 September 2022, Komunalno podjetje Velenje ceased supplying on 1 October 2022 and Domplan ceased supplying on 1 November 2022.

Four exits of suppliers from the retail market in 2022

Consumers can choose between offers from all suppliers offering natural gas in their local community. Individual natural gas suppliers, smaller in terms of annual supply quantities, only supply natural gas to customers in the local communities where they also carry out natural gas distribution activities under the umbrella of the same company. Consumers pay for the natural gas supplied monthly on the basis of the actual quantity consumed as measured by the metering device, or on the basis of the estimated quantity[161] consumed if the operator does not have a reading from the metering device.

160 The Energy Agency considered as suppliers those companies that are members of the balance group or balance sub-group.
161 Calculated on the basis of the provisions of the Methodology for the prognosis of non-daily metered off-takes of users of the natural gas network.

FIGURE 224: NUMBER OF SUPPLIERS ON THE RETAIL MARKET IN SLOVENIA IN THE 2018–2022 PERIOD



SOURCE: ENERGY AGENCY

During the five-year period under review, major changes in the number of suppliers on the market can be observed, in particular in 2022. In the last year, four suppliers have ceased their activity of supplying natural gas.

The diversity and abundance of offers have been significantly reduced, mainly due to the adoption of the Decree on setting gas prices from the system at the end of the year, while the amendment of the Gas Supply Act also introduced the right to a basic supply. At the end of 2022, all suppliers supplying household consumers only offered natural gas supply on the basis of so-called regular offers[162], or a basic supply, where no time commitment for the supply period or other conditions are required and the consumer can switch supplier at any time without paying a contractual penalty. Action offers, which can be limited to a certain range of consumers and usually contain contractual penalties if the consumer withdraws early from the contract, disappeared from the retail market in the last quarter of the year. At the end of 2022, household consumers were no longer able to reduce the cost of their natural gas supply by choosing a new supplier, thus temporarily bringing the competitive market to a complete standstill.

Natural Gas Prices in the Retail Market

Price monitoring on the retail market is carried out on the basis of 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.

The retail gas prices in supply offers mainly depend on price developments on wholesale markets, the purchasing conditions that suppliers secure for themselves in trading, and the business decisions of the individual supplier. Several factors influence the level of the purchase price paid by the supplier. For example, natural gas prices depend on the geopolitical situation, the characteristics of the gas purchase contracts concluded, the evolution of oil and oil product prices, the evolution of the coal price, the evolution of emission allowance prices, the evolution of foreign currency exchange rates, the weather, supply and demand on the international exchanges and market competition. In addition to the above, natural gas prices on the retail market in 2022 were strongly influenced by the Decree on setting gas prices from the system, which prescribed a maximum retail price for household and small business customers from 1 September 2022, which was then set by all suppliers in their offers at the same level.

162 After the termination of the regular price list definition under the EZ-1, these are offers that are accessible to all consumers and do not contain any requirements for meeting specific conditions (bindings, penalties, etc.).

Retail Price Index

As part of its monitoring of the relevant market, the Energy Agency determines the Retail Price Index (RPI). The RPI is based on the cheapest offer available on the market that is accessible to all consumers, which allows consumers to switch supplier without contractual penalties for an unlimited period of time. It only reflects the price potential, not the realised price based on the contracts concluded.

A 173% interim increase in the price of the best offer on the retail market

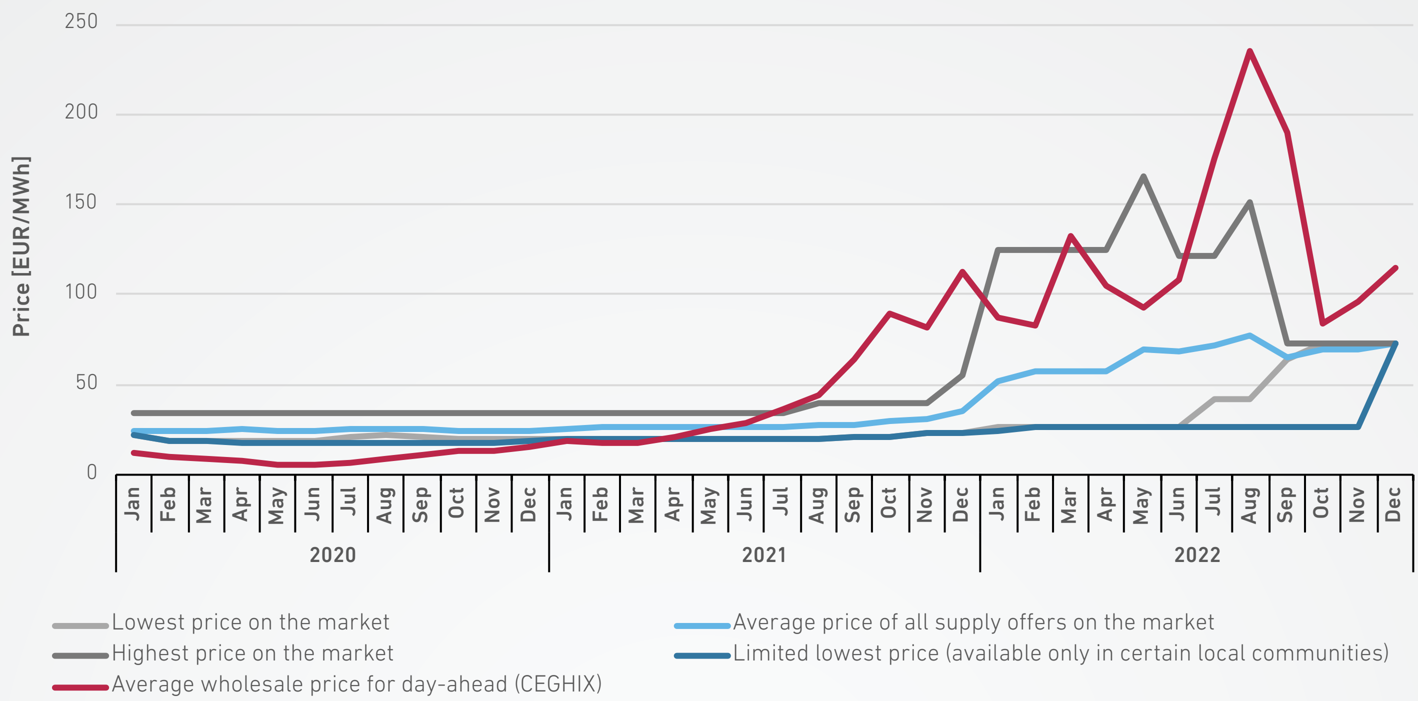
Figure 225 shows the trend in the following prices for a typical household consumer:

- limited lowest price (available only in certain local communities),
- the lowest price in the market,
- the average price of all offers in the market, and
- the highest price in the market.

In the first half of 2022, the minimum retail prices for natural gas were fairly stable, with no major changes observed. In July, the minimum price increased by 56% compared to June. The next major jump in the minimum price on the market followed in September when the price increased again by 54%. Two more increases followed before the end of the year, in October and December. In December, the minimum market price also equalled the maximum retail price for natural gas set by the Decree on setting gas prices from the system. This meant that all offer prices for household customers were aligned with the maximum retail price for natural gas. At the end of the year, the minimum market price was 173% higher than at the beginning of the year. Throughout the year, the lowest market supply price available to a wider range of local authorities was less favourable than the lowest market supply price available only in a certain range of local authorities.

The increases in the retail prices were driven by rising wholesale natural gas prices in Europe, which were mostly on an upward trend until the end of August, when record-high wholesale natural gas prices were reached both in the spot markets and in the case of long-term futures. In early 2022, at the end of the first trading day, the settlement price of natural gas on the day-ahead wholesale market of the Austrian CEGH was EUR 72,345/MWh. The peak value of these futures contracts was recorded on 26 August 2022, when the settlement price at the end of the trading day was EUR 312,569/MWh. The same futures contracts then reached a settlement price of EUR 75,298/MWh at the end of the trading day on the last trading day of the year. On average, the wholesale prices on the Austrian CEGH exchange in 2022 for day-ahead futures were around 169% higher than in 2021. The wholesale prices are usually transmitted to the retail market with a lag of around six months, which to some extent also reflects the evolution of the lowest, average and highest prices on the market. Due to rising wholesale prices, the number of promotional offers on the retail market in 2022 was low, and even these were mainly available in the first quarter. Suppliers did not replace expiring campaigns with new ones in the second half of 2022. The lowest retail price on the market at the end of the year was EUR 73/MWh, which was in line with the maximum retail price allowed under the Decree on setting gas prices from the system.

FIGURE 225: RETAIL PRICE INDEX AND SOME TYPICAL NATURAL GAS PRICES WITHOUT THE NETWORK CHARGE, DUTIES AND VAT IN THE 2020–2022 PERIOD



SOURCE: ENERGY AGENCY

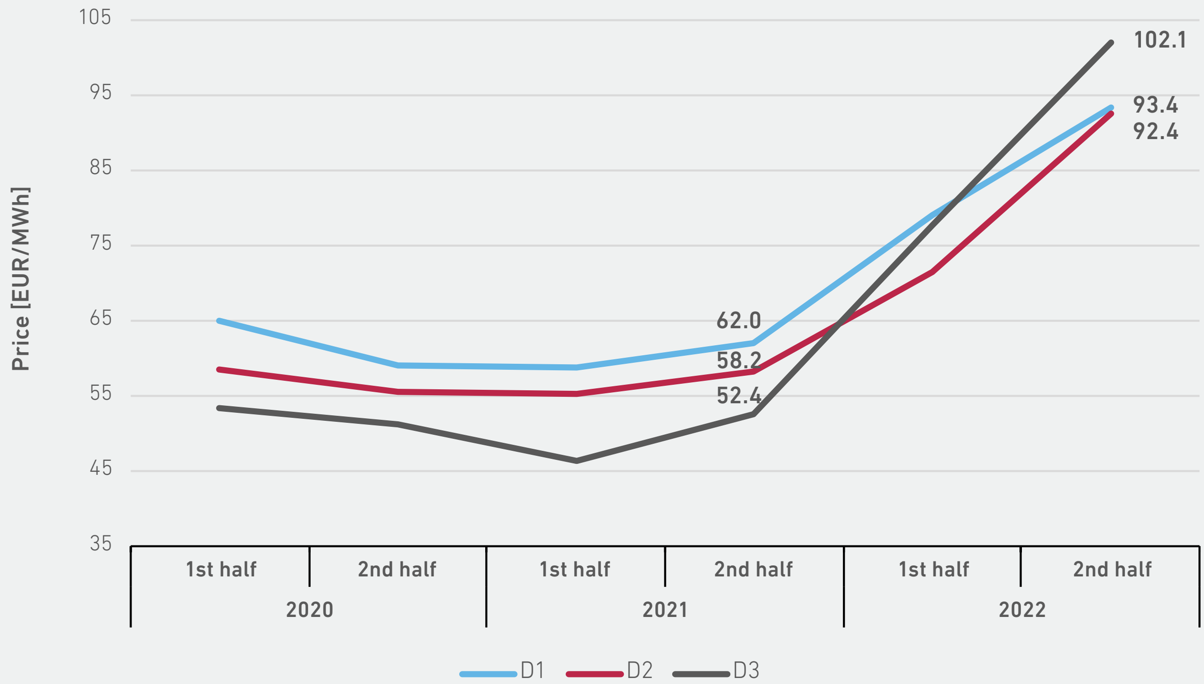
In January, ECE offered the lowest supply price, which was available in all local communities for consumers with the new contract. In the period from February to June inclusive, GEN-I offered the lowest price. In July and August, Petrol then offered the lowest price, before being replaced by Adriaplin in September. In October and November, Energetika Ljubljana was the lowest bidder, and then in December the lowest supply prices were equalised for all suppliers. The equalisation was the maximum retail price set by the Decree on setting gas prices from the system. The price levels in the first half of the year are due to the composition of the portfolios of the individual suppliers, which held futures contracts purchased on the wholesale markets before the start of the price increase or during the earlier periods of the wholesale price increase. The retail price increase itself is well-reflected in the increase in the average price of all offers on the market, which recorded a 41% interim increase.

A 41% interim increase in the average price of natural gas

Final Prices of Natural Gas

Figure 226 shows the evolution of the price of natural gas, including all taxes and charges for household consumers in the 2020–2022 period. Compared to the second half of 2021, the prices for all household consumption groups increased in the first half of 2022. The increase in final prices also followed in the second half of the year compared to the first half. The mentioned increase was somewhat mitigated by the change in the billing of natural gas supplies, which is charged at a tax rate of 9.5% as from 1 September 2022 (previously a tax rate of 22% was in force) and by the abolition of the environmental levy obligation, which was in force for the period from 21 June 2022 to 1 August 2022 and from 13 September 2022 onwards. The most significant price increase occurred for the group of large household consumers in consumption group D3, which mainly concerns consumption points for the supply of common boiler rooms of multi-apartment buildings. In the second half of the year, prices for these consumers were 31.3% higher than in the first half of the year. While this customer group continued to pay a more favourable final natural gas price per MWh in 2020 and 2021 compared to the D1 and D2 customer groups, a reversal took place in 2022.

FIGURE 226: FINAL NATURAL GAS PRICES FOR HOUSEHOLD CONSUMERS IN SLOVENIA WITH ALL TAXES AND DUTIES IN THE 2020–2022 PERIOD

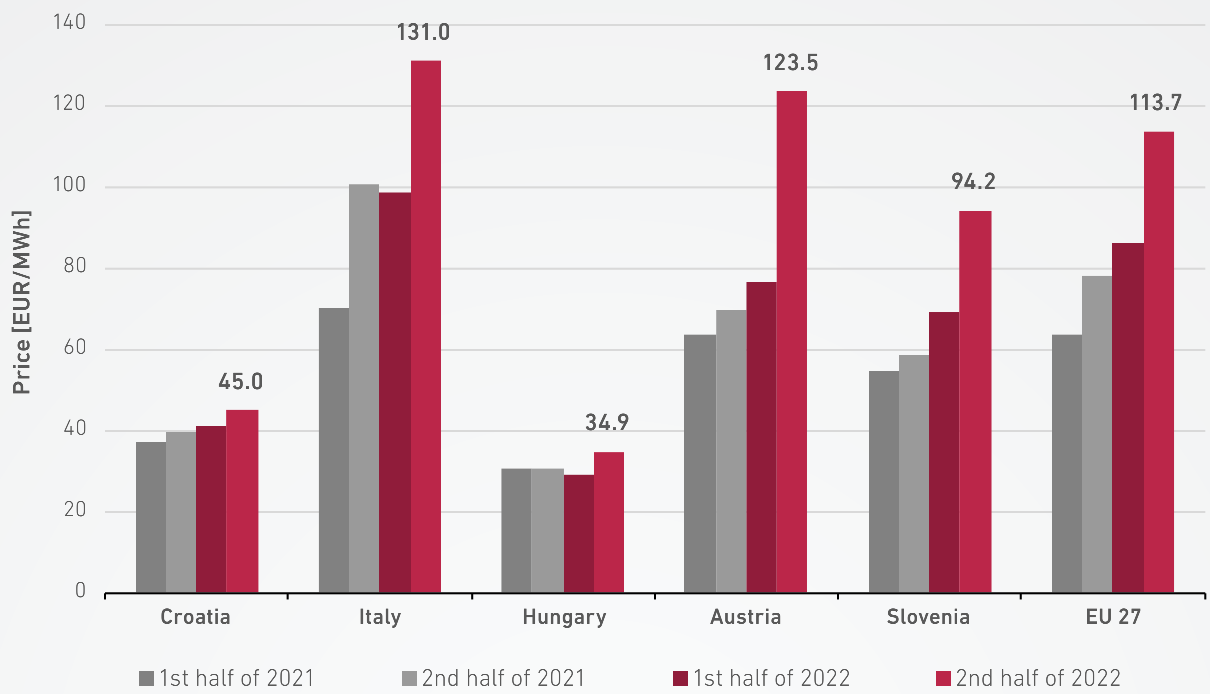


SOURCE: SURS

The final price of natural gas for a typical household consumer remains below the average EU-27 prices

Figure 227 shows the movement of the final natural gas prices with all taxes and levies in 2021 and 2022 for a typical D2 household natural gas consumer in Slovenia and neighbouring countries. Final natural gas prices in Slovenia increased by 44% year-on-year in 2022. A semi-annual view reveals that the final natural gas prices increased by 17% in the first half of the year compared to the second half of 2021, while the final natural gas prices increased by 36% in the second half of the year compared to the first half of 2022. The final natural gas prices for typical household consumers in Slovenia remain below the EU average. As in Slovenia, natural gas prices have increased on an annual basis in all the neighbouring countries. The highest price increase was recorded in Austria, with a 50.4% annual increase compared to 2021, while the lowest increase was recorded in Hungary, at 4.6%. In 2022, the final natural gas prices also differed to a slightly larger extent between EU countries due to the different measures taken by EU Member States to mitigate energy price increases.

FIGURE 227: FINAL PRICES OF NATURAL GAS FOR TYPICAL D2 HOUSEHOLD CONSUMERS, INCLUDING TAXES AND LEVIES, IN SLOVENIA AND IN NEIGHBOURING COUNTRIES IN 2021 AND 2022

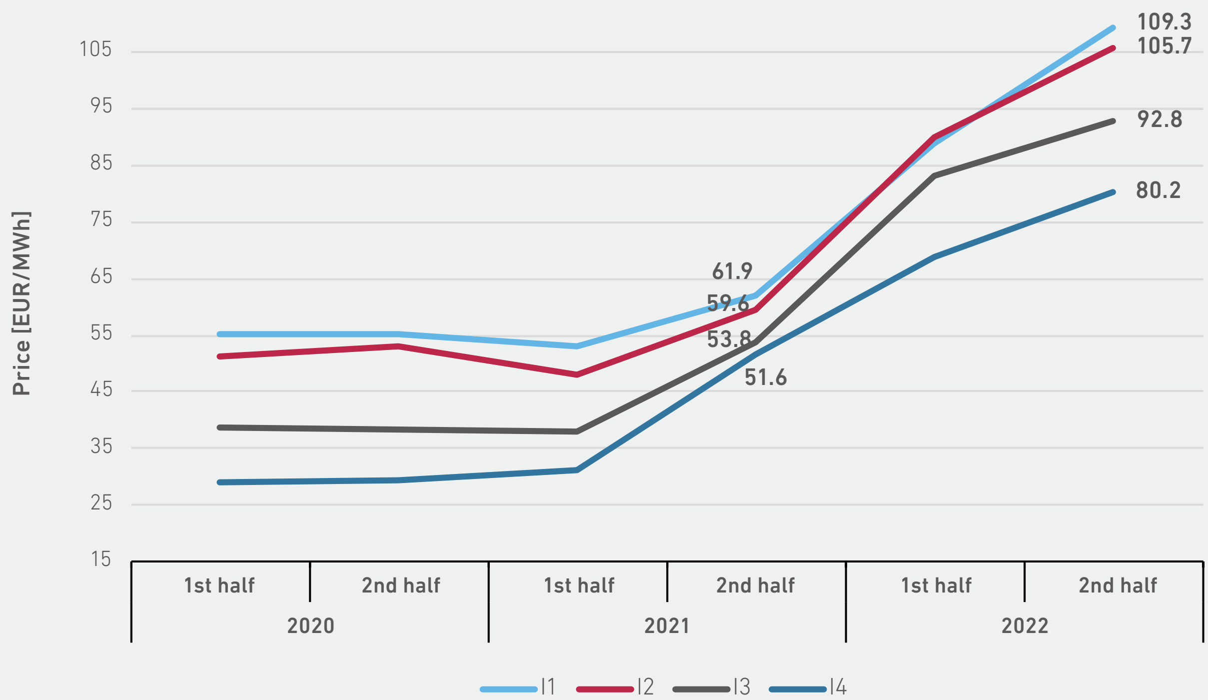


SOURCE: EUROSTAT

Figure 228 shows the final price of natural gas, including all taxes and charges, for business consumers over the 2020–2022 period. Compared to the second half of 2021, prices in the first half of 2022 were higher for all customer groups. In the second half of 2021, the prices increased further compared to the first half of 2021 for all consumer groups. The highest year-on-year increase between the first and the second half of 2022 was recorded for customer group I1 at 22.8%. The highest year-on-year increase in the final price of natural gas during this period was recorded for customer group I3 at 91.6%. The increase in natural gas prices on the wholesale market was therefore strongly reflected in the final prices of natural gas for business customers.

A 91.6% increase in the final price of natural gas for business consumer in consumption group I3

FIGURE 228: FINAL PRICES OF NATURAL GAS FOR BUSINESS CONSUMERS IN SLOVENIA, INCLUDING TAXES AND LEVIES, IN THE 2020–2022 PERIOD

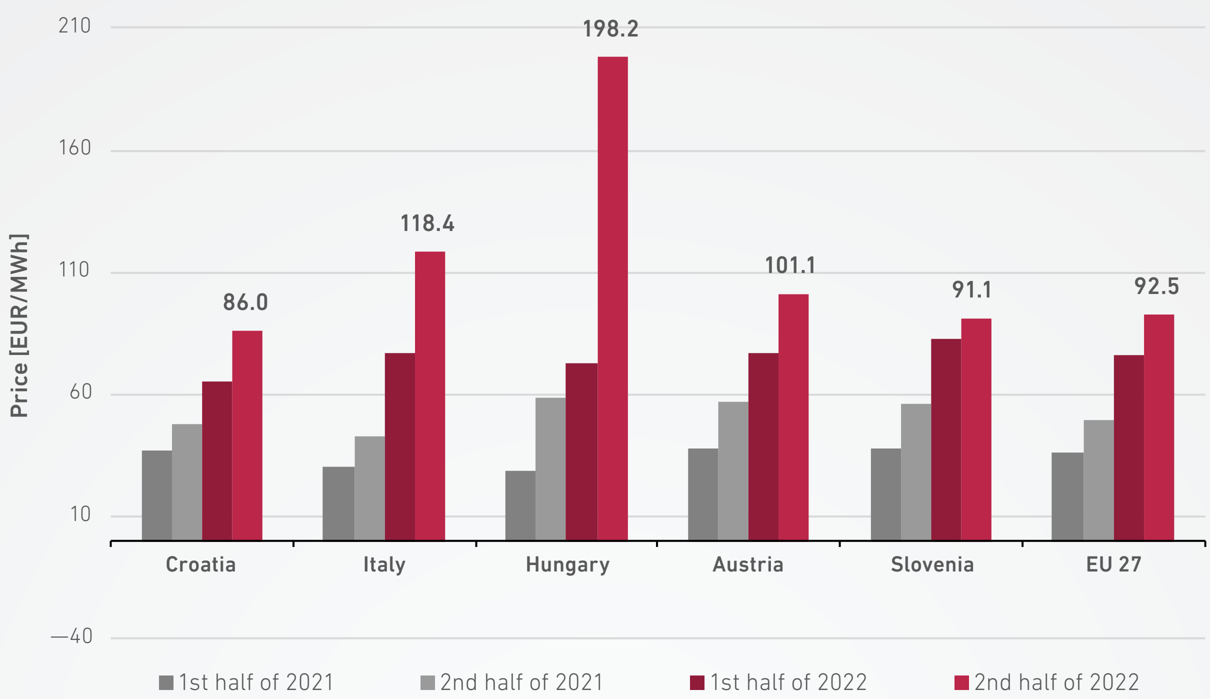


SOURCE: SURS

The final gas price for business consumers was 3% above the average EU-27 prices

Figure 229 shows the natural gas price trend with all taxes and levies in 2021 and 2022 for typical business customers of I3 natural gas in Slovenia and neighbouring countries. For these consumers, the final price of natural gas in Slovenia increased by 85.5% on an annual basis, while the semi-annual increase in the second half of the year was 9.9% compared to the first half. The final price of natural gas for typical business consumers was 3% above the EU average. Compared to a year earlier, the final prices were also higher in all neighbouring countries. Natural gas final prices increased the most on an annual basis in Hungary, by 212%; the latter also experienced the highest half-year growth, with final prices increasing by 170.8% in the second half of the year compared to the first half. Business consumers in Croatia experienced the smallest price increase, with an interim increase in the final price of natural gas of 79.5%.

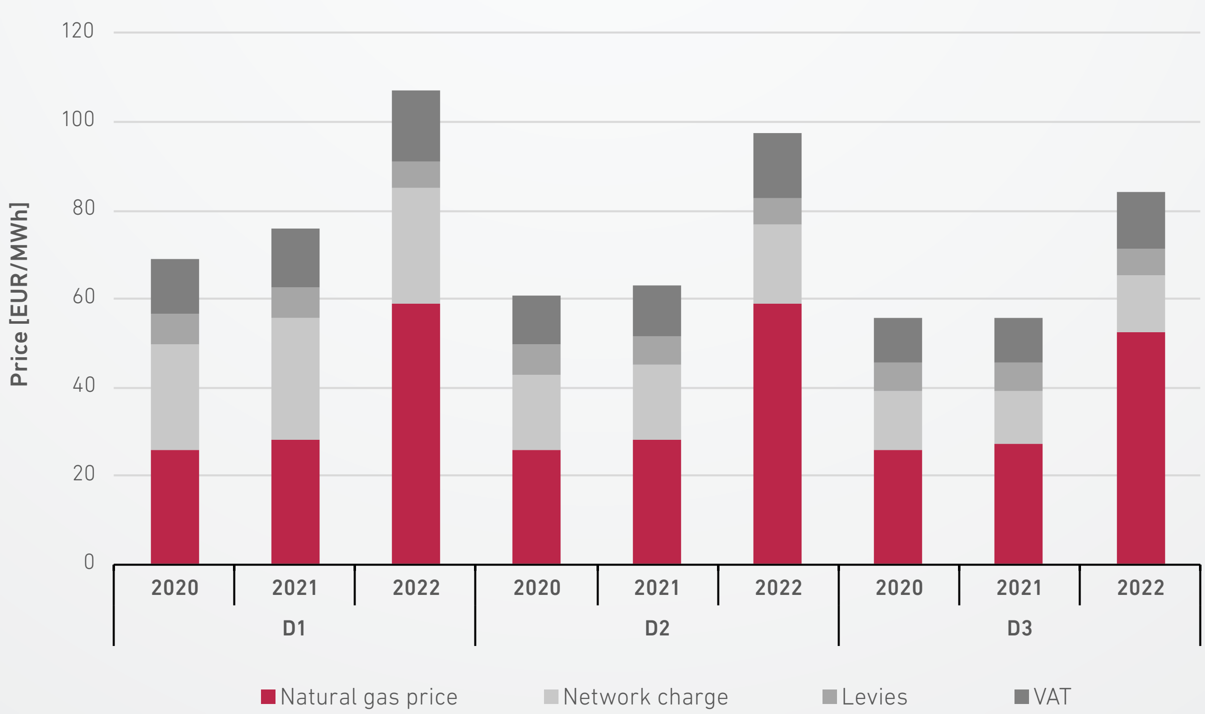
FIGURE 229: FINAL PRICES OF NATURAL GAS FOR TYPICAL I3 BUSINESS CONSUMERS, INCLUDING TAXES AND LEVIES, IN SLOVENIA AND IN NEIGHBOURING COUNTRIES IN 2021 AND 2022



SOURCE: EUROSTAT

Figures 230 and 231 show the structure of the final price for typical residential and commercial consumers connected to the distribution systems in the 2020–2022 period.

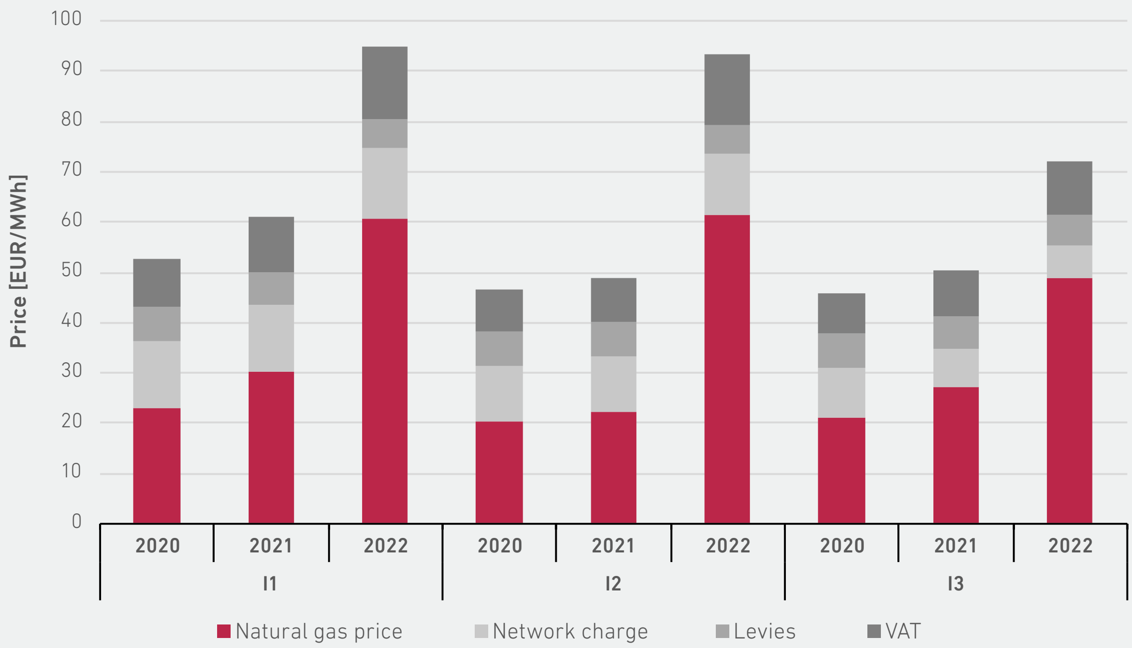
FIGURE 230: STRUCTURE OF THE FINAL NATURAL GAS PRICE FOR HOUSEHOLD CONSUMERS IN THE 2020–2022 PERIOD



SOURCES: SUPPLIERS

In the structure of the final price of natural gas for household consumers, the percentage of the energy price component has increased in 2022 compared to the previous year in all consumption groups. The increase was most pronounced in consumption group D1, where it amounted to 18 percentage points, while the increase was smallest in consumption group D3, where it amounted to 13.5 percentage points. In all customer groups, the percentage of the network component of the final price decreased, with the highest decrease being in customer group D1 at 11.8 percentage points and the lowest decrease in customer group D3 at 5.7 percentage points. A change in the share of the levy component in the final price was also observed in all customer groups. In consumption group D3, the share of levies in the final price of natural gas decreased to the largest extent, by 4.9 percentage points, while in consumption group D1, on the other hand, the share of levies in the final price of natural gas decreased to the smallest extent, by 3.3 percentage points. The VAT share also decreased by around 2.9 percentage points in all the consumption groups.

FIGURE 231: STRUCTURE OF THE FINAL NATURAL GAS PRICES FOR BUSINESS CONSUMERS IN THE 2020–2022 PERIOD



SOURCES: SUPPLIERS

In the structure of the final price of natural gas for business consumers, the percentage of the energy price component increased in 2022 compared to the previous year for all consumption groups. The increase was 14.2 percentage points for group I1, 20.1 percentage points for group I2 and 13.5 percentage points for group I3. On the other hand, the share of the network charge in the structure of the final price of natural gas for business consumers for all consumption groups decreased compared to the previous year, with decreases of 6.6 percentage points for group I1, 9.8 percentage points for I2 and 5.6 percentage points for I3. The share of charges in the final price of natural gas for business consumers also decreased. The reductions were 4.7 percentage points for consumption group I1, 7.4 percentage points for I2 and 5.1 percentage points for I3. The VAT share was also reduced by around 2.9 percentage points for all consumption groups.

For both residential and business consumers, the share of energy costs in the final price of natural gas supply has increased. The higher retail prices led to higher final prices for natural gas; taking into account that the network charge has not changed significantly compared to the previous year, the share of the network charges and levies in the final price of supply has decreased. The amount of the charges was further reduced due to the measures taken by the Government, which included a reduction in excise duties and the suspension of the environmental levy. Excise duties were reduced from 1 February 2022, while the suspension of the environmental levy was in force for the period from 21 June 2022 to 1 August 2022 and from 13 September 2022 onwards. The reduction of the VAT component in the final price of natural gas was due to the year-on-year changes in the VAT rates for energy products. From 1 September 2022 to 31 May 2023, natural gas is taxed at a rate of 9.5% (previously a rate of 22% was in force).

Market Transparency

The Financial Transparency of Suppliers and the Transparency of Bills

Financial transparency is ensured by the legal obligation of the supplier to prepare annual reports. The transparency of bills is regulated in a systematic way by the legislation in force. The invoice for natural gas supplied separately shows the amounts for natural gas consumed, the network charge (distribution and metering), the energy efficiency contribution, the RES and CHP contribution, the environmental levy (CO_2 tax), the excise duty and the VAT. In the absence of innovative offers in the natural gas retail market, the current legislation ensures an adequate level of transparency in the accounting of the cost of supply.

The Obligation to Publish Supply Offers

Suppliers must provide household and small business consumers with transparent information on their offers for the supply of natural gas and the related applicable price lists, as well as the general contract terms and conditions for the supply service.

The Energy Agency's Activities for Providing Transparency

The Energy Agency regularly monitors the functioning of the natural gas retail market, including the number and characteristics of published offers, focusing on prompt action on identifying controversial practices. Data on current offers and any changes in the characteristics of these offers are provided by the obliged parties to the Energy Agency on a monthly basis and are used by the Energy Agency for electronic services in the framework of the single contact point, in accordance with the legislation. With the aim of ensuring transparency in the natural gas retail market, the Energy Agency's website provides users with comparative e-services, among which is the online application for the comparison of natural gas supply costs (cost comparator). The application enables the calculation and comparison of the natural gas supply amount for each consumption profile based on the offers entered in the web application by suppliers. The Energy Agency also provides an e-Invoice Check service, which allows users to check the correctness of the bill for the gas supplied according to the selected offer and consumption profile. The monthly calculation is displayed separately by billing component. Users of the comparison services had access to all the price lists or basic information on all the suppliers' offers. Users of the cost comparator are able to, among other things, quickly access individual price lists and the general contract terms and conditions of suppliers.

Increased consumer interest in using comparative natural gas supply cost services

An analysis of the use of benchmarking services in the area of natural gas supply is presented in the section Ensuring Transparency in the Retail Electricity Market. The analysis of the number of comparisons and invoice verifications carried out confirms the marked increase in customer interest, with a 73% increase in the number of comparisons carried out compared to 2021, and a 158% increase in the number of customers carrying out comparisons, mainly due to supplier exits from the market.

Market Effectiveness

The results of monitoring the efficiency and competitiveness of the retail natural gas market presented below are based on the continuous processing of data submitted to the Energy Agency by the reporting entities (suppliers).

Market Shares and HHI of the Natural Gas Retail Market

Supply of Natural Gas to Final Consumers

Table 40 shows the market shares of suppliers to all final consumers on the natural gas retail market in Slovenia.

TABLE 40: MARKET SHARES AND HHI OF SUPPLIERS TO ALL FINAL CONSUMERS IN THE NATURAL GAS RETAIL MARKET

Supplier	**Delivered energy [GWh]**	**Market share**
Geoplin	4,223	47.2%
Petrol	969	10.8%
GEN-I	873	9.8%
Adriaplin	809	9.1%
Energetika Ljubljana	752	8.4%
Plinarna Maribor	566	6.3%
Goodyear Slovenija	153	1.7%
ECE	118	1.3%
Energija plus	110	1.2%
Enos	96	1.1%
Energetika Celje	94	1.1%
Other small suppliers	179	2.0%
Total	**8,944**[163]	**100.0%**
HHI of the retail market		**2,647**

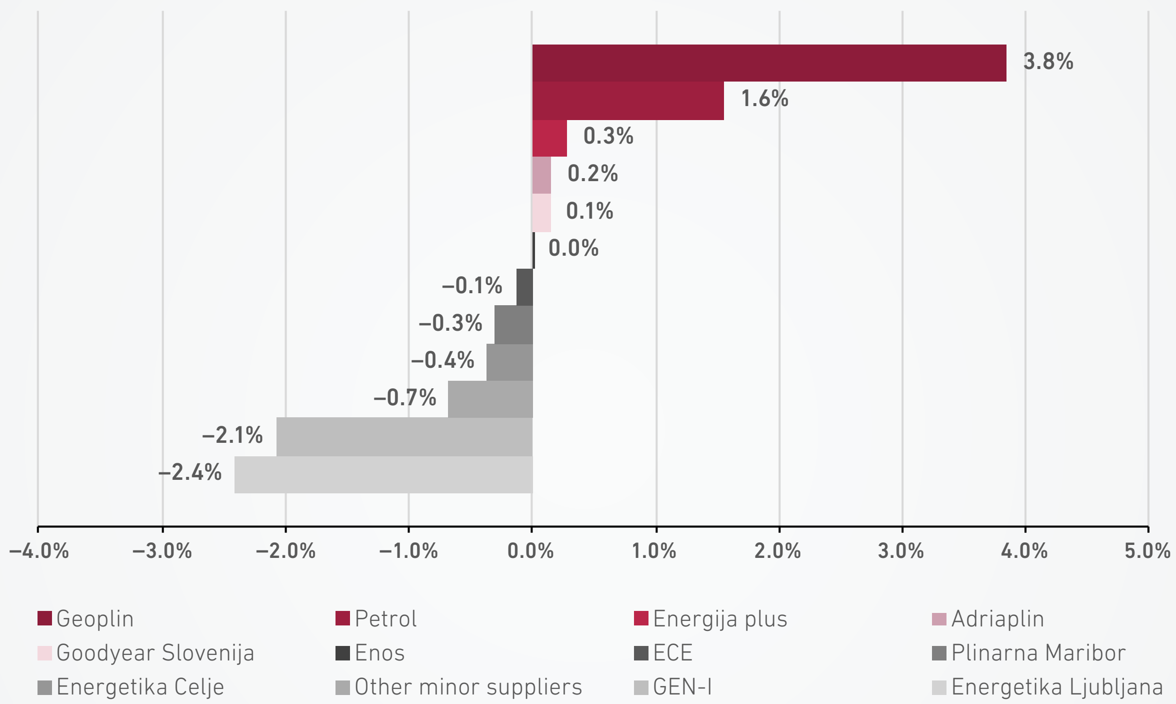
SOURCE: ENERGY AGENCY

163 The difference between the total and the individual supplier totals is due to rounding to one decimal place.

The HHI value shows that the retail market is highly concentrated (the HHI is more than 2000). Compared to 2021, the HHI value increased by 284, indicating a slightly less competitive market. Among all the suppliers, Geoplin managed to increase its market share the most in 2022, with an increase of 3.8 percentage points, and Petrol increased its market share by 1.6 percentage points. On the other hand, GEN-I and Energetika Ljubljana suffered the biggest market share losses. The year-on-year changes in the market shares of suppliers are shown in Figure 232.

The natural gas retail market remains highly concentrated

FIGURE 232: CHANGES IN THE MARKET SHARES IN THE FINAL CONSUMERS MARKET IN 2022 IN COMPARISON TO 2021[164]



SOURCE: ENERGY AGENCY

Notwithstanding these changes in the suppliers' market shares, the situation at the end of 2022 was far from competitive for the retail market for natural gas, as at the end of the year, all suppliers were offering gas to household consumers, small business customers and certain other consumption groups at the maximum retail price allowed by the Decree on setting gas prices from the system. Some more variety may have been available to business customers with an unregulated price, but in most cases this price is not publicly published, so it is difficult to speak of supply competition on the basis of different prices. In many cases, customers faced a major challenge in finding a supplier willing to enter into a supply contract with them. To a considerable extent, the market shares of individual suppliers at the end of 2022 reflect the competitive behaviour of the past period, i.e. before the maximum retail prices for supply to each type of customer were set.

164 Changes in the market shares are rounded to one decimal place.

The Supply of Natural Gas to Business Consumers

The market shares of the natural gas suppliers in the retail market for business consumers in 2022 are presented in Table 41.

TABLE 41: MARKET SHARES AND HHI OF SUPPLIERS TO ALL BUSINESS CONSUMERS IN THE NATURAL GAS RETAIL MARKET

Supplier	Delivered energy [GWh]	Market share
Geoplin	4,223	54.2%
Petrol	805	10.3%
Adriaplin	697	8.9%
GEN-I	610	7.8%
Energetika Ljubljana	441	5.7%
Plinarna Maribor	427	5.5%
Goodyear Slovenija	153	2.0%
Enos	96	1.2%
Energija plus	94	1.2%
ECE	94	1.2%
Other small suppliers	153	2.0%
Total	**7,793**	**100.0%**
HHI of the retail market		**3,259**

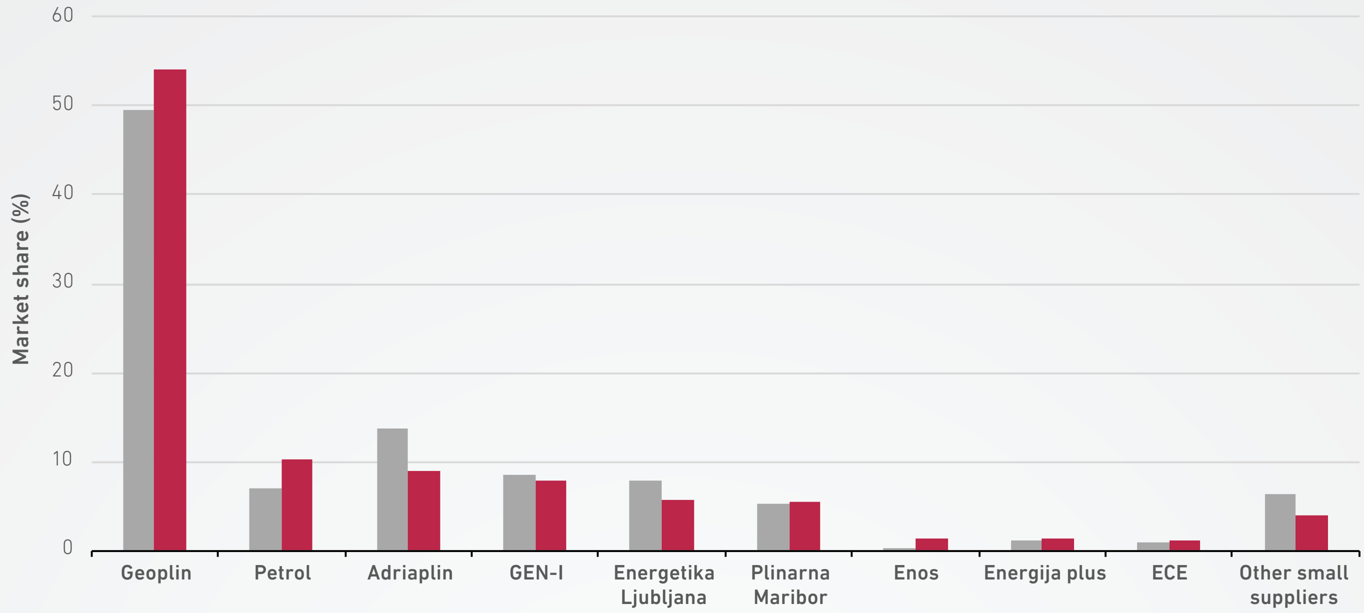
SOURCE: ENERGY AGENCY

The HHI value shows that this is a highly concentrated retail market (the HHI is more than 2000). In 2022, the HHI further increased by 387. Geoplin and Petrol also gained the largest share in the business supply market, with Geoplin increasing its market share by 4.3 percentage points, while Petrol increased its market share by 1.4 percentage points. Five suppliers managed to increase their market share. Energetika Ljubljana and GEN-I lost the largest part of their market share. Both lost 2.7 percentage points of market share[165].

The changes in the market shares of suppliers to business customers in 2018 and 2022 are shown in Figure 233. The largest increases in market shares were recorded for Geoplin (4.7 percentage points), Petrol (3.4 percentage points) and Enos (1.2 percentage points), while the decreases were most pronounced for Adriaplin (4.7 percentage points), Energetika Ljubljana (2.1 percentage points) and a group of smaller suppliers (2.4 percentage points). The shares of natural gas supplied to business consumers point to a decrease in the competitiveness of the market for consumers, as the two largest suppliers by volumes of supply strengthened their shares. This was also significantly influenced by the fact that smaller suppliers were much more reluctant to sign new supply contracts in order to attract new customers, given the volatile market conditions and the highly volatile natural gas prices. As a consequence, the two largest suppliers, which were likely to be somewhat less financially exposed due to their control over the supply of significantly larger volumes of gas, gained shares.

165 The difference is rounded to one decimal place.

FIGURE 233: COMPARISON OF THE SUPPLIERS' MARKET SHARES TO BUSINESS CONSUMERS IN 2018 AND 2022



SOURCE: ENERGY AGENCY

The Supply of Natural Gas to Household Consumers

The market shares of the natural gas suppliers in the retail market for household consumers in 2022 are presented in Table 42.

TABLE 42: MARKET SHARES AND HHI OF SUPPLIERS TO ALL HOUSEHOLD CONSUMERS IN THE NATURAL GAS RETAIL MARKET

Supplier	Delivered energy [GWh]	Market share
Energetika Ljubljana	311	27.0%
GEN-I	264	22.9%
Petrol	164	14.2%
Plinarna Maribor	138	12.0%
Adriaplin	112	9.8%
Istrabenz plini	29	2.5%
Energetika Celje	28	2.5%
Domplan	27	2.4%
ECE	24	2.1%
Energija plus	16	1.4%
Other small suppliers	37	3.2%
Total	**1,151**[166]	**100%**
HHI of the retail market		**1,731**

SOURCE: ENERGY AGENCY

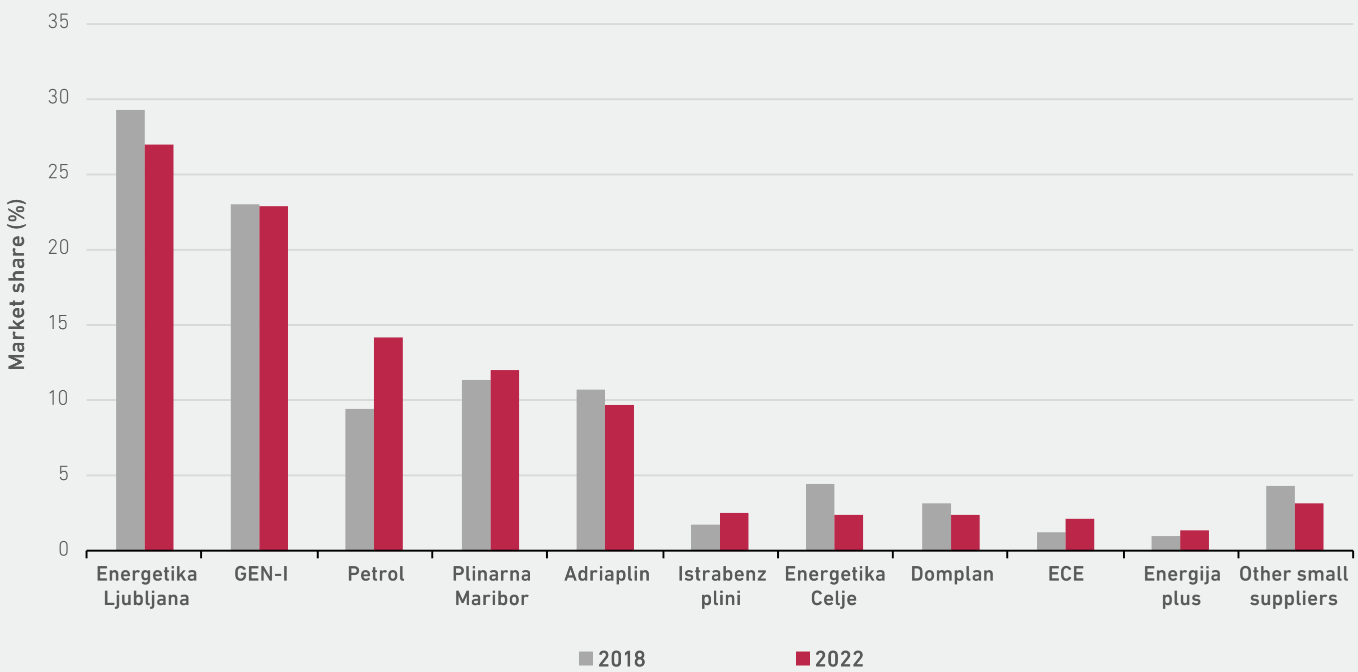
166 The difference between the total and the individual supplier totals is due to rounding to one decimal place.

The HHI value indicates a low concentrated retail market (HHI less than 2000). Compared to 2020 and 2021, when the HHI was 1689 and 1657 respectively, the HHI has increased in 2022. The market share of the three largest suppliers (CR3) was just over 64.1%, with Petrol replacing Plinarna Maribor among the top three suppliers. The remaining suppliers with a supply share above one percent of the total volumes supplied to household customers remain the same as in 2021.

In 2022, Petrol managed to increase its market share by more than 1 percentage point compared to the previous year, with a 2.6 percentage point increase, and GEN-I managed to increase its market share by 2.2 percentage points. On the other hand, the largest market share declines in the household segment were suffered by Energetika Celje, which saw its market share decrease by 1.7 percentage points[167], and Plinarna Maribor, which saw its market share decrease by 1.6 percentage points. Other smaller suppliers and Domplan also suffered market share losses of 1.1 percentage points. The latter no longer supplies natural gas as of November, nor does E.ON as of September and Komunalno podjetje Velenje as of October. The latter two were part of the group of other smaller suppliers. In the context of the above market share changes, it should be borne in mind that in some cases, there was no classic loss of market shares in a competitive market, as individual suppliers were reluctant to enter into new supply contracts with customers due to the crisis situation in the gas market, the volumes of gas not purchased on an annual basis, and the unpredictable gas prices in spot markets.

The changes in the market shares of suppliers to household customers in 2018 and 2022 are shown in Figure 234. On the other hand, the market shares of Energetika Ljubljana (2.2 percentage points), Energetika Celje (2 percentage points) and other smaller suppliers (1.1 percentage points) decreased the most over the years.

FIGURE 234: COMPARISON OF THE SUPPLIERS' MARKET SHARES TO HOUSEHOLD CONSUMERS IN 2018 AND 2022



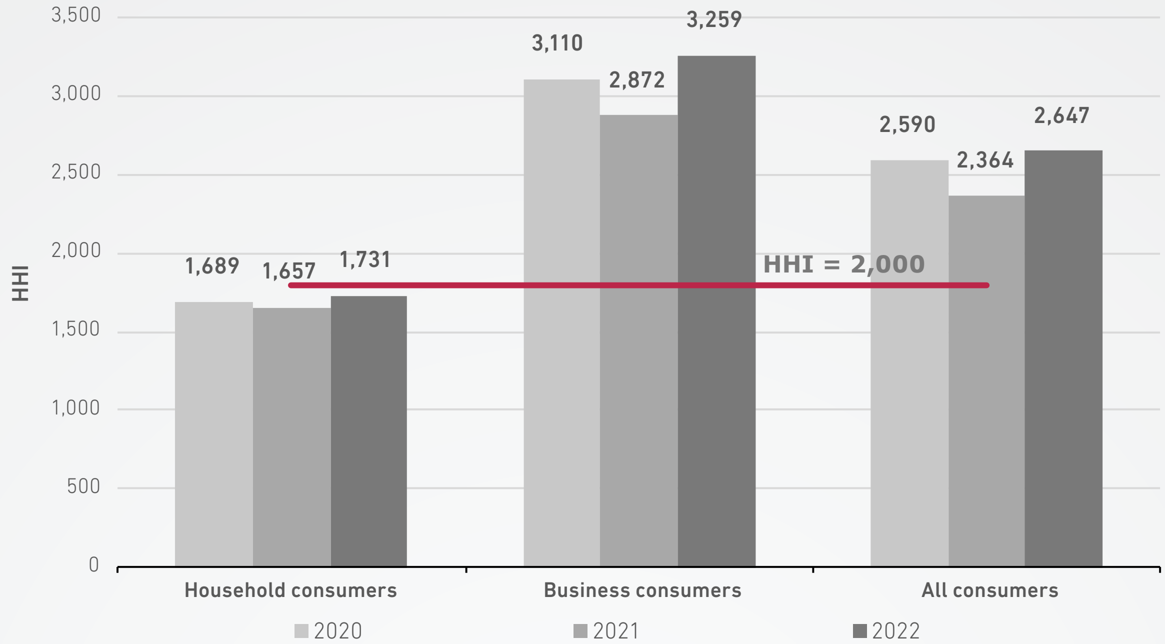
SOURCE: ENERGY AGENCY

Comparison of Concentrations on the Relevant Markets

The HHI increased in 2022 across all supply segments in the retail market. The increase in HHI in 2022 also marked a reversal from 2021, when the HHI declined across all supply segments in the retail market. The household customer segment remains the only observed market with a low concentration. According to the HHI, the business customer market is a highly concentrated one.

167 The difference is rounded to one decimal place.

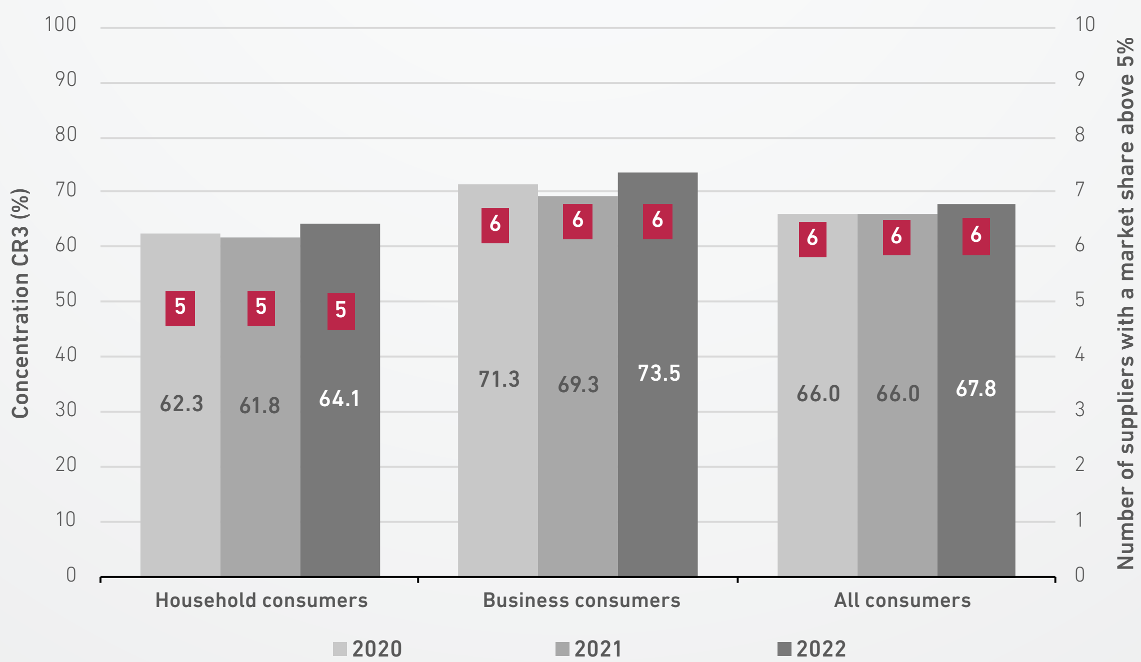
FIGURE 235: MOVEMENT OF THE HHI IN THE RETAIL MARKET IN THE 2020–2022 PERIOD



SOURCES: SUPPLIERS

Figure 236 shows the degree of concentration of the three CR3s[168] in each market segment over the last three years. In 2022, the CR3 values exceeded the limit for a high level of concentration (70%) in the segment of supply to business customers. A negative trend of increasing the level of concentration can be observed in 2022 compared to the year before in the supply to both household and business customers. The negative trends are primarily the result of the severe and unstable conditions on the natural gas market, as a result of which four suppliers stopped supplying natural gas in 2022. This trend was also influenced for a significant part of the year by the reluctance of individual smaller suppliers to conclude a new supply contract with customers after the expiration of the contract for a certain period of time.

FIGURE 236: LEVEL OF CONCENTRATION OF CR3 AND THE NUMBER OF SUPPLIERS WITH A MARKET SHARE ABOVE 5% IN THE 2020–2022 PERIOD



SOURCES: SUPPLIERS

168 Total market share of the three largest suppliers on the market.

Switching Supplier

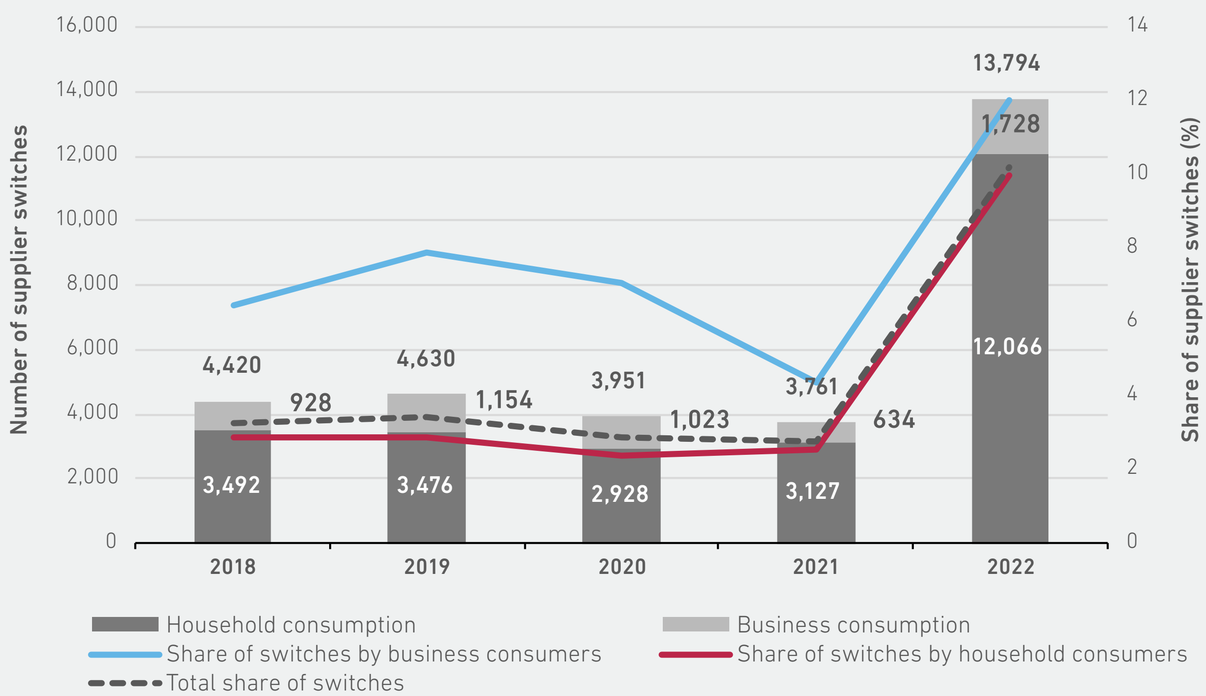
A 286% increase in switching for households and a 173% increase in switching for business natural gas consumers

The number of switches is one of the key indicators of a well-functioning retail market. In Slovenia, we would like to see more diversified and attractive supplier offers, and in particular more active consumers, many of whom, it can be assumed, are not even aware that they can switch, and most of whom have never switched since the opening of the market.

In 2022, the retail market for natural gas was subject to major structural changes as a result of the high volatility of prices on the wholesale markets. These changes were also strongly reflected in switching, as the dynamics of switching changed significantly compared to the previous years. 13,794 consumers connected to the distribution network switched their natural gas supplier, namely 12,066 household and 1,728 business consumers. The average number of monthly changes of supplier was 1005 for household and 144 for business consumers. Compared to 2021, the total number of switches increased by 267%. The number of switches increased by 286% for household and 173% for business consumers. The downward trend in the total number of switches was broken in 2022 after two consecutive years (2020 and 2021). The total number of switches was higher in all the months of 2022 compared to the same months of the previous year.

Figure 237 shows the trend in the total number of switches and the share of switches by type of consumer over the 2018–2022 period.

FIGURE 237: NUMBER OF SUPPLIER SWITCHES IN THE 2018–2022 PERIOD



SOURCE: ENERGY AGENCY

The switching rate for residential customers reached 10% in 2022, which would qualify the market as a heating active market[169], in terms of the level of activity in the market, though the increased activity is due to structural changes and abnormal competition, as explained in more detail below. Compared to a year earlier, the switching rate of household consumers increased by 7.4 percentage points. For business customers, the switching rate increased by 7.7 percentage points compared to 2021, reaching 12%. In previous years, the highest switching rates[170] in the EU on a metered basis, with more than 26%, were recorded in the Netherlands and Belgium. These two countries are the only ones above 20% on an annual basis, which is also the limit of the most developed or active markets. For both household and business consumers, the annual number of switches has increased significantly compared to previous years. The average annual switching rate of household consumers over the last five-year period was 4.1%, while the average switching rate of business consumers over the last five-year period was 7.5%.

Strong responsiveness of residential and commercial natural gas consumers to changing market conditions

In 2022, in contrast to previous years, only business consumers experienced an increase in the number of switches at the beginning of the year, due to the expiry of fixed-term supply contracts, which are often concluded for a calendar year, and a number of consumers failed to sign a new supply contract with their existing supplier. The number of switches of suppliers by household consumers escalated at the beginning of the year until the end of the heating season in April, when it reached its first peak, which was due to some extent to the retail price increases initiated in this period and to better information provided to consumers due to the reporting of energy price increases, which led to a more intensive search for potential savings. Figure 238 shows that the number of switches of suppliers by household and business consumers increased markedly in the last quarter of the year, which was due, among other things, to the cessation of supply activities by Komunalno podjetje Velenje (1 October 2022) and Domplan (1 November 2022), the announcement by Energetika Celje that it would cease supplying, and the start of the new heating season. During this period, 124 household and 31 small business customers switched to an alternative supply.

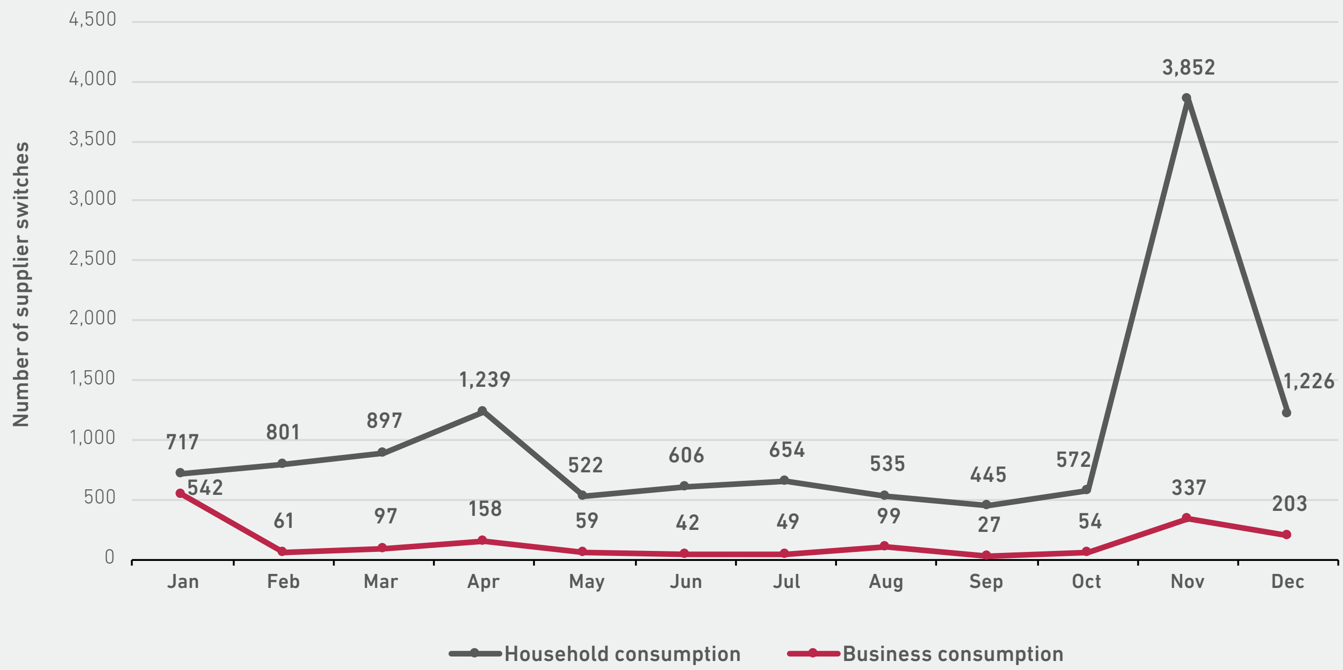
An unusual trend in supplier switching compared to previous years

These switches to an alternative supply are included in the switching data. The aforementioned withdrawals of these suppliers and the higher retail prices result in a completely atypical trend in 2022 compared to previous years, which is also a consequence of the previous announcement of the withdrawal of the supplier E.ON from the market as of September and the announcement by Energetika Celje that it intends to withdraw from the retail market (it later decided not to withdraw), and, as mentioned earlier, the improved awareness of consumers about the energy prices themselves and the potential for saving by switching suppliers.

169 Definition by VaasaETT, »World Energy Retail Market Rankings«, 2012

170 ACER/CEER Annual Report on the Results of Monitoring the Internal Electricity and Natural Gas Markets in 2021 – Energy Retail and Consumer Protection Volume, october 2022, figure 17

FIGURE 238: DYNAMICS OF THE NUMBER OF SUPPLIER SWITCHES DEPENDING ON THE TYPE OF CONSUMPTION

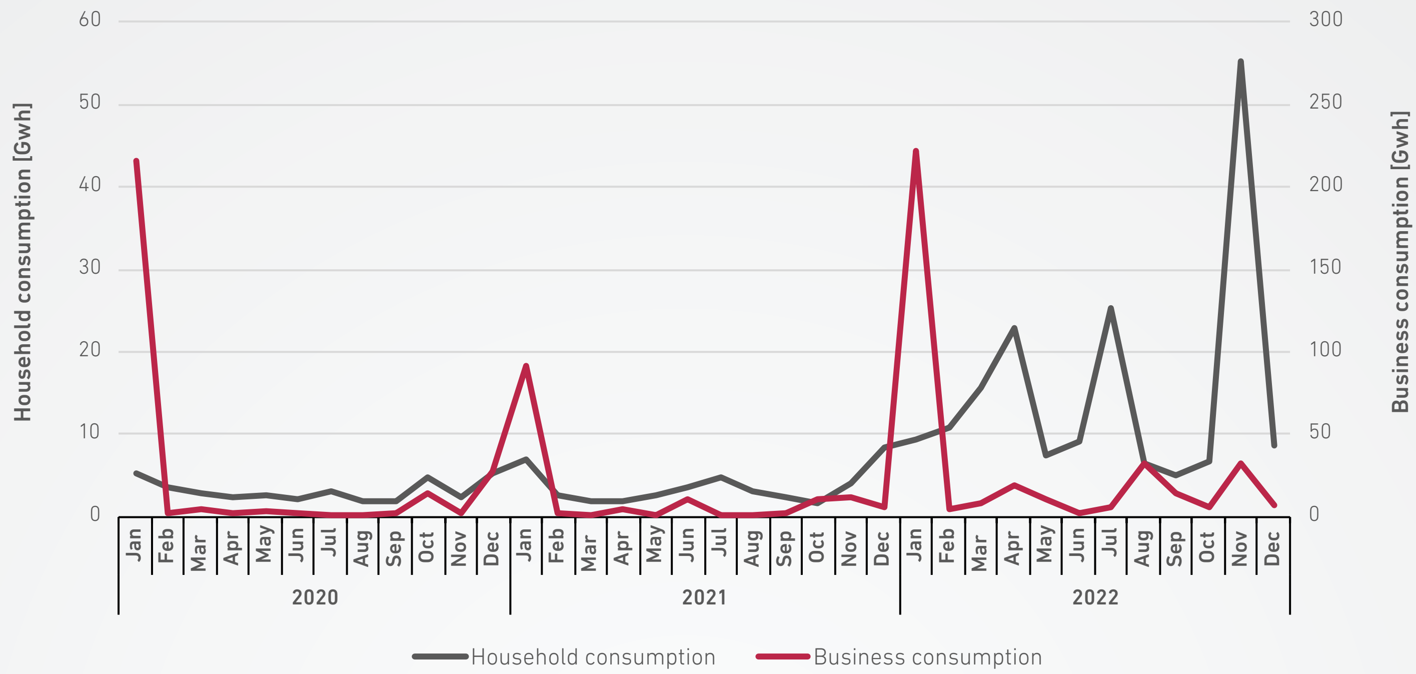


SOURCE: ENERGY AGENCY

Business consumers made more than 31% of all switches in January, while household customers made 32% of all switches in November, due to the aforementioned cessation of supply by Domplan. The share of energy switching in 2022 for business consumers was 4.7%, up 3 percentage points year-on-year, while for household consumers, it was 15.9%, up 12.5 percentage points year-on-year. The energy switched is the estimated annual consumption of natural gas of customers who have switched supplier. Similarly to the number of switches, the amount of energy switched for both business and household consumers showed an increase, though the increase was more pronounced for household consumers. Given the higher retail prices for natural gas and the faster pass-through of wholesale prices to the retail market, it can be concluded that several larger business customers with higher forecast consumption have been able to secure a better deal from their current supplier than they would have received on the market. On the other hand, it can be concluded that household consumers with a higher estimated consumption were more active in switching compared to household consumers with a lower estimated consumption.

Figure 239 shows the trend in the quantities of natural gas exchanged in the 2020–2022 period.

FIGURE 239: QUANTITIES OF EXCHANGED GAS WITH RESPECT TO THE TYPE OF CONSUMPTION



SOURCE: ENERGY AGENCY

As can be seen in Figure 239, the quantities of gas exchanged in the segment of household consumption was the highest in April, July and November, indicating an atypical seasonal pattern of supplier switching. In the business segment, the volume of natural gas switched was highest in January, April, August and November. The change in the pattern is mainly due to retail price increases and changes in the retail market related to supplier exits.

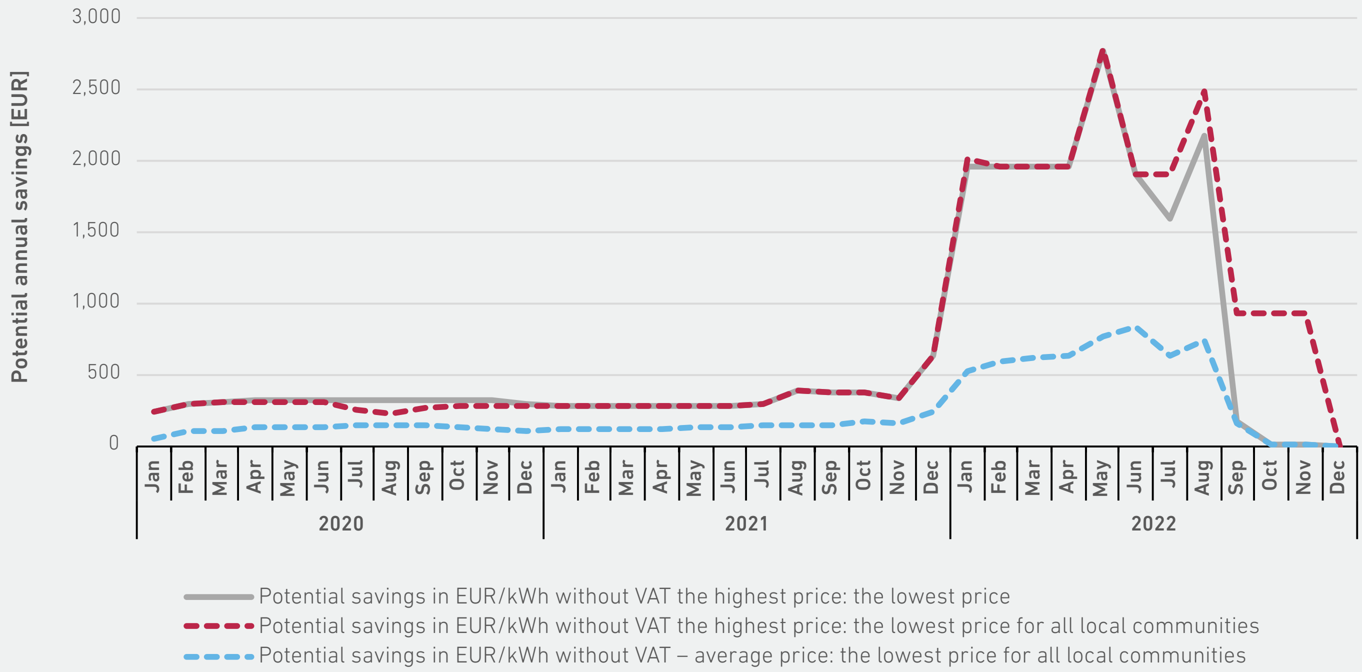
Estimating the Potential Benefits of Switching Supplier

By switching supplier, any household or legal entity can reduce its annual cost of natural gas supply, influence the payment terms and other provisions of its contractual relationship with the supplier, or obtain additional benefits linked to a particular offer. As natural gas consumption is highly correlated with the heating season, consumers can make significant savings in the colder months, when consumption is typically at its peak, by being supplied on the basis of the most affordable offers.

A sharp decline in potential savings in the last quarter of 2022

Figure 240 shows the trend in potential savings for a typical household consumer with an annual consumption of 20,000 kWh.

FIGURE 240: POTENTIAL SAVINGS IN CASE OF SWITCHING NATURAL GAS SUPPLIER FOR A TYPICAL HOUSEHOLD CONSUMER IN THE 2020–2022 PERIOD



SOURCE: ENERGY AGENCY

The potential savings of switching from the supplier with the highest supply price to the supplier with the lowest supply price available in all local authorities ranged between zero and EUR 2781.6 in 2022, assuming a 12-month supply period under the same conditions. Due to the rising prices on the retail market, the potential savings for existing consumers from some suppliers were largely increasing during the year until September. The increase in potential savings was due to the faster growth of the highest price on the market compared to the lowest price available to customers in all local authorities. The increase in potential savings stopped in September as a result of the adoption of the already-mentioned Decree, which set a maximum retail price for natural gas. Just after it entered into force, some savings were still possible as there were still differences between the minimum offer price available to consumers in all local authorities and the maximum price, which has now been capped. In the following months, however, suppliers who still had offers available to consumers in September that were below the maximum price set by the Decree decided to raise the price to the level set by the legislation. In December, the supply prices for household customers were already equalised on the basis of all the suppliers' offers, and customers were no longer able to influence the cost of supply by choosing a new supplier.

Measures to Promote Competition

The Energy Agency monitors the natural gas retail market and cooperates with the regulatory and supervisory authorities at the national level, such as the Market Inspectorate of the Republic of Slovenia, the Slovenian Competition Protection Agency and, where appropriate, with independent and non-profit consumer organisations. The Energy Agency's actions are diverse and result from internal analyses of the Energy Agency, bilateral activities and the results of public consultations. Within the framework of the single contact point, the Energy Agency keeps up-to-date relevant information on market development.

The price of natural gas as an energy product is not regulated and is determined freely in line with supply and demand on the wholesale and retail markets.

In 2022, for the first time since 2007, when the conditions for a competitive natural gas market were established, the natural gas prices were fixed as part of the Government's intervention measures to mitigate the effects of the crisis (see the case study How we tackled the energy crisis).

In the natural gas market, activities are underway to harmonise the most important data exchange processes at the national and regional levels. The implementation of data exchange processes in the natural gas market is still generally not based on open standards.

The establishment of the uniform information system has finally accelerated the harmonisation of data exchange processes in the natural gas market

In the natural gas market, activities are underway to harmonise the most important data exchange processes at the national and regional levels. The implementation of data exchange processes in the natural gas market is still generally not based on open standards.

Significant progress has been made in the harmonisation of data exchange processes in the natural gas market, as the provisions of the Act Amending the Gas Supply Act have led the transmission system operator to establish a uniform information system necessary for the operation of the gas market and for ensuring a reliable gas supply. A uniform information system will keep data on all consumption points, consumption, the affiliation of the consumption points to the system operator, supplier, balance group and group according to the purpose of gas consumption, and other data necessary for the operation of the gas market and for ensuring the security of the gas supply. With the establishment of this system, an agreement was reached between the distribution system operators and the transmission system operator on the necessity of implementing the standardised labelling of metering points in all natural gas distribution systems in Slovenia in accordance with the Act on the Identification of Entities in Electronic Data Exchange Between Electricity and Natural Gas Market Participants. The Act obliges market participants to use standardised identifiers of key data entities in the electronic exchange of data on the market. The uniform and standardised identification of metering points throughout Slovenia is important to reduce the costs of implementing IT systems by market participants (entry costs for new entrants), to improve the efficiency of the switching process and to ensure the effective introduction of the new supplier identification system. Standardisation in the area of data exchange is becoming even more important due to the requirements for cross-sectoral integration. The labelling of metering points based on standardised identifiers was not yet in place for all DSOs by the end of 2022. It is expected to be completed in the first half of 2023.

In the natural gas market, the same rules apply as for other types of goods related to preventing restrictions of competition and abuses of dominant positions. According to publicly available data, the Slovenian Competition Agency did not identify any restrictive practices or potential dominant positions on the natural gas market by undertakings active on the market in 2022.

In the context of the concentration review, in 2022 the Public Agency for the Protection of Competition issued a decision on the merger review of the acquisition of control by Istrabenz plini over GTG gas and Ardoks, whereby it did not oppose the concentration or declared it to be in line with the competition rules.

The Security of the Natural Gas Supply

In 2022, the situation with regard to the security of natural gas supply has changed significantly due to the tense geopolitical situation and the increased risk of the partial or total disruption of gas supplies from Russia. All EU Member States have started to reduce or phase out their consumption of natural gas from Russia and to look for alternative sources. In addition, they have voluntarily reduced their gas consumption, as provided for in the temporary Council Regulation (EU) 2022/1369 of 5 August 2022 on coordinated demand-reduction measures for gas. As a result, consumers have reduced part of their energy demand and switched to other energy sources.

Eleven Member States have declared the first of the three crisis levels, the early warning level, and one Member State has declared the second level, the alert level. Slovenia declared an Early Warning Stage in July 2022. This also alerted Slovenian consumers that, after a long period of highly reliable and uninterrupted natural gas supply, there could be shortages and possibly even restrictions on consumption. In line with this EU Regulation, the Government has also called on consumers to use natural gas more economically, and the amendment to the Gas Supply Act has eliminated the potential consequences for consumers if they reduce their consumption beyond the limits set in their supply contract.

There were no shortages or supply disruptions in the winter of 2022/23. Adequate gas volumes were provided by natural gas suppliers and natural gas markets were functioning at all times. As in several Member States, natural gas suppliers provided energy to Slovenia from new, mostly non-Russian sources and brought it to Slovenia via other transmission routes. At the border points between Slovenia and other Member States, we have seen significant changes in the gas flows, in particular an increase in flows from west to east. In Slovenia, flows at the Šempeter border crossing point were higher than in previous years, as described in more detail in section Capacity at Border Points of this report.

EU natural gas market participants have worked together to achieve a high level of storage capacity, which exceeded 95% at the start of the winter. There has also been regular communication and coordination between TSOs, represented by the ENTSOG association of TSOs, Member States and their Competent Authorities, and the EC in the framework of the Gas Coordination Group (GCG). This group presented the results of several calculations and simulations on how to deal with the winter of 2022/23 while maintaining enough gas in storage at the end of the winter to be able to fill it until the next winter. Other aspects of winter preparedness were also a major focus of the group. In view of the high gas prices on the market in 2022, the EC has developed terms and conditions and developed a gas joint platform to aggregate demand and achieve better terms and conditions for future gas purchases.

Gas supply remained uninterrupted, but gas consumption in the EU and Slovenia was reduced due to the changed situation

Slovenia, like other Member States, had adapted the Legal Act on the Emergency Plan for Natural Gas Supply. The most significant novelties are the call for a general reduction in gas consumption and the revised sequence of reduction and termination of gas supply to groups of consumers. This sequencing takes into account new criteria based on the purpose for which the gas is consumed at each consumption point, as well as the economic importance of the consumer. The measures are also graduated, with the plan providing for the application of the minimum necessary mandatory measures, which are adapted daily to the current situation. The amendment of the Gas Supply Act required the TSO to develop a new uniform information system to make the data needed for crisis management more accessible and usable. The implementation of the uniform information system continued into 2023. Before the start of the winter season, the Energy Agency adopted two further acts to prepare for possible situations in which gas shortages might require mandatory measures to reduce or terminate consumption. Legal Act on the Methodology for Calculating the Gas Price in the Event of the Involuntary Reduction or Interruption of Gas Consumption sets out the method for calculating the gas price in such situations. The gas price in the event of the involuntary reduction or interruption of gas offtake is an integral part of the crisis gas price and is charged for the quantities of crisis gas released into the system as a result of the implementation of the above measures. However, the Legal Act on the Methodology for Calculating Compensation in the Event of the Involuntary Reduction or Interruption of Gas Consumption sets out the method for calculating the compensation to which gas consumers are entitled in such situations.

Slovenia is well prepared for potential crisis situations

The compensation is determined for three groups of consumers, Business and industrial consumers and power plants, and is intended to cover part of the costs of switching to other energy sources or other technologies.

Slovenia is also prepared for a possible peak gas shortage affecting protected customers. In such a case, the country could ask for solidarity assistance from neighbouring countries, which would have to offer gas to supply protected customers. Such assistance is governed by the Inter-State Agreement on Solidarity Measures to Ensure the Security of the Gas Supply between Slovenia and Italy as from 2022. A similar agreement has been technically coordinated with Croatia, while negotiations on a similar agreement with Austria are ongoing.

Since the declaration of the Early Warning Stage, the Crisis Group has also been active, meeting regularly and ready to coordinate crisis management measures in Slovenia should the need arise.

The functioning of the Crisis Group and the actions taken were also tested during a two-day exercise in Slovenia in September 2022, which showed a generally good state of preparedness for a possible gas shortage. It also showed that the ways stakeholders and the Crisis Group communicate with each other could be improved, and this has been taken into account in the new Emergency Plan.

The European Commission carried out an exercise to check the responsiveness of Member States and their mutual communication

In December 2022, an EU-wide exercise was carried out to test the response of individual countries to a two-week period of particularly cold temperatures, such as those experienced over the last 20 years, with reduced gas supplies to the EU. An important part of the exercise was the communication between Member States and the EC in crisis situations. Slovenia took part in the exercise and demonstrated that it had a well-prepared team to lead the crisis team and coordinate actions at the national and EU levels.

The Energy Agency held a two-day Crisis Group exercise

The consumption of protected customers in 2022 was 1,922 GWh of gas. The amendment to the Gas Supply Act in autumn 2022 broadened the definition of protected customers to now include common household customers, kindergartens, primary schools and health centres.

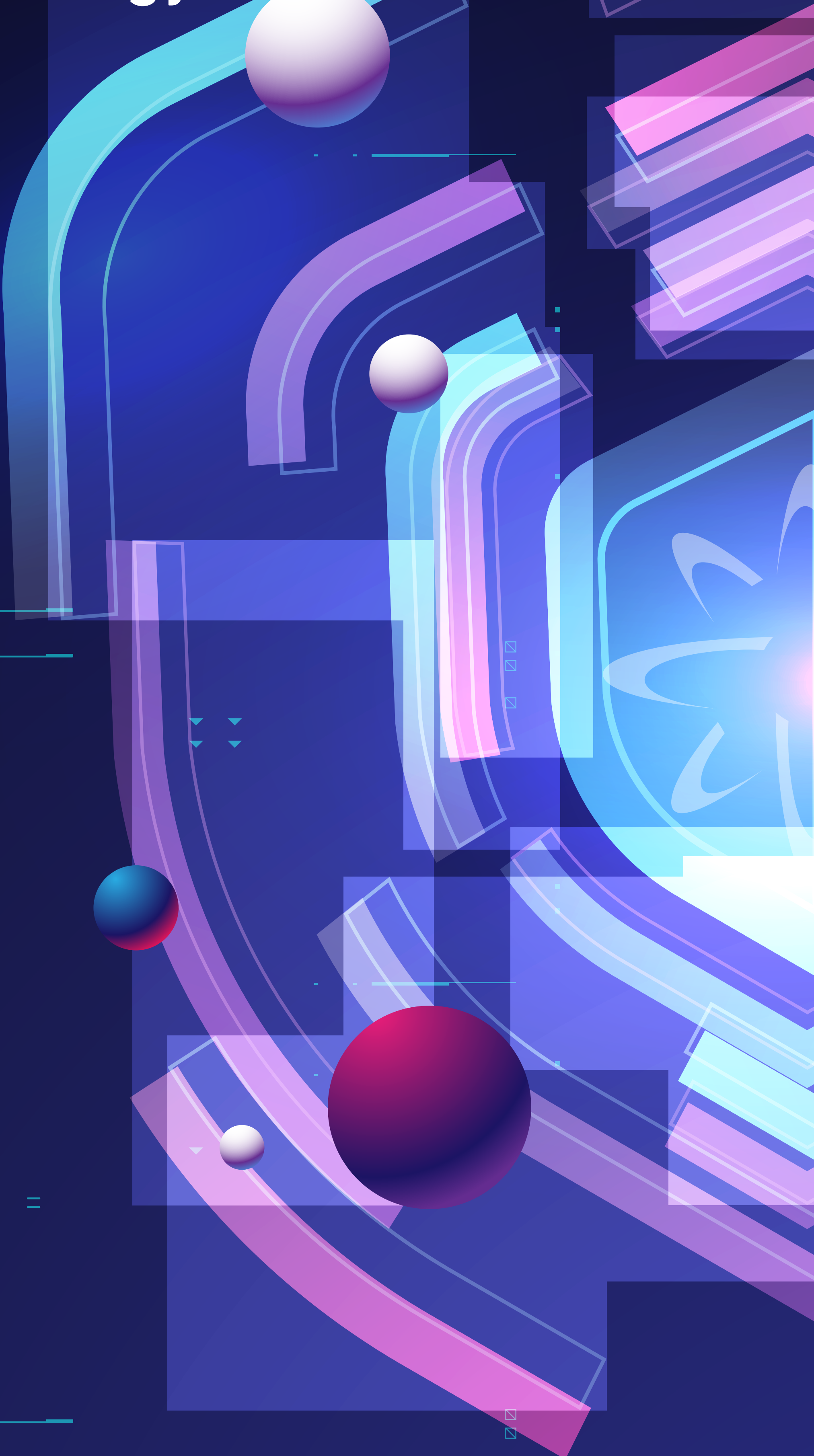
Each year, gas suppliers must meet a supply standard for a one-year period starting on 1 October of that year. The supply standard obliges suppliers to provide gas to protected customers for three cases. The total quantities of gas to meet the supply standard from the beginning of October 2022 to the end of September 2023 were:

(a) in the seven-day period with the lowest temperatures: 14,226 MWh/day;
(b) in a 30-day period with particularly high demand: total 30-day quantities of 253,665 MWh or an average of 8,455 MWh/day;
(c) during a 30-day period with an interruption on each of the largest infrastructures: 10,079 MWh/day.

Suppliers must provide the quantities indicated for case (a) for seven consecutive days and for cases (b) and (c) for thirty consecutive days. The suppliers provided gas from different sources and through different transmission routes. Sufficient transmission capacity is available to Slovenia for the quantities indicated.

CONSUMER PROTECTION

The right to reliable, good quality and affordable energy



5630

EE CONSUMERS ON LAST RESORT SUPPLY

UNINTERRUPTED SUPPLY TO PROTECTED GROUPS OF CONSUMERS GUARANTEED:

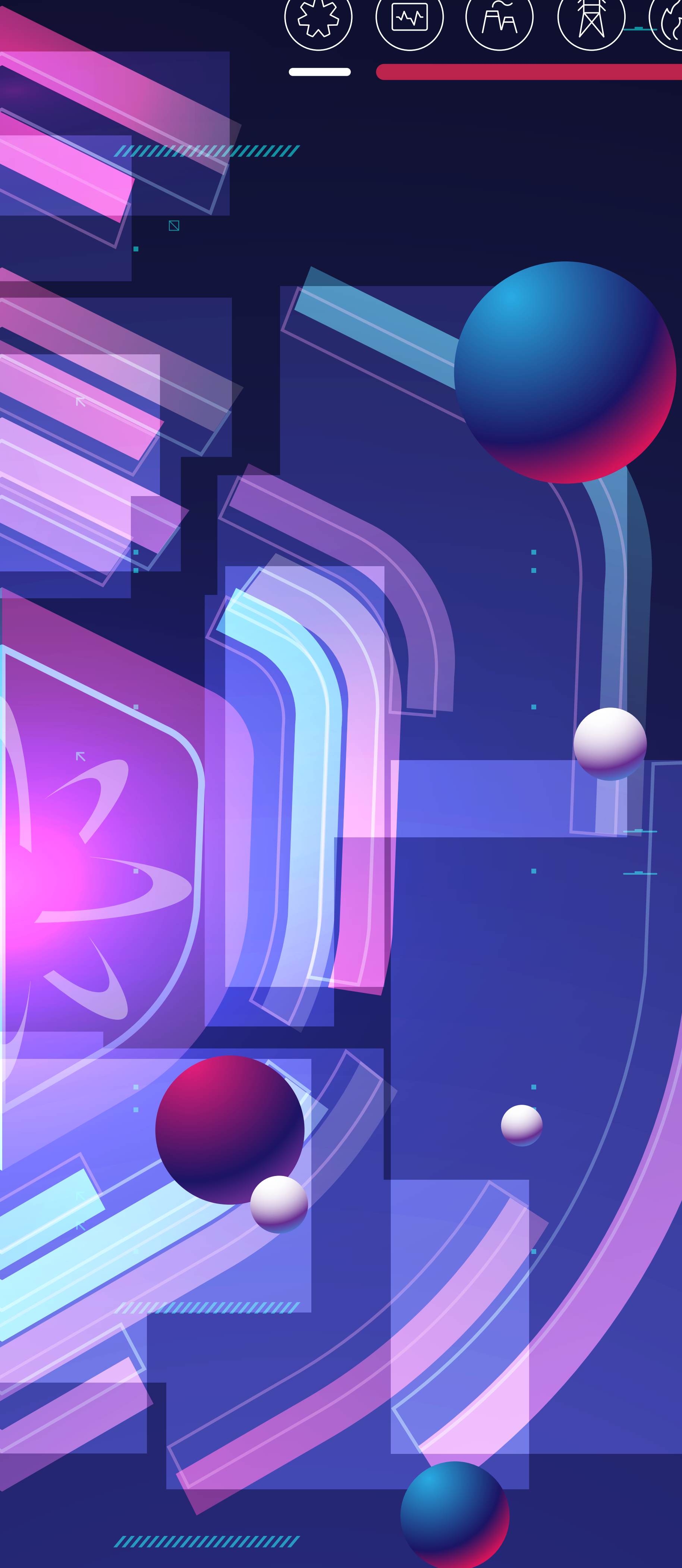
1. ALTERNATIVE SUPPLY

– AUTOMATIC SWITCHING OF CONSUMERS WHO REMAIN WITHOUT A SUPPLIER

– FIVE SUPPLIERS APPOINTED

2. BASIC SUPPLY

– THE CONSUMER'S RIGHT TO AN OFFER ON THE MARKET



952%
OF ALL NETWORK USE COMPLAINTS

RELATED TO THE REFUSAL OF CONSENT TO CONNECT A SELF-SUPPLY INSTALLATION TO THE ELECTRICITY DISTRIBUTION SYSTEM

THE MAJORITY OF COMPLAINTS OF HOUSEHOLD CONSUMERS TO SUPPLIERS WERE UNJUSTIFIED

- 58% IN THE ELECTRICITY AREA
- 64% IN THE NATURAL GAS AREA

48% FEWER COMPLAINTS BY ELECTRICITY CONSUMERS

33% MORE COMPLAINTS BY NATURAL GAS CONSUMERS

CONSUMER PROTECTION

Promoting effective competition and thus a well-functioning electricity and gas market benefits all consumers. In 2022, the protection of customers' rights has also received more attention, as developments and record price movements in the wholesale markets for electricity, gas and emission allowances have had an impact on the retail markets. Particular protection has been given to household consumers, as they are less active and, for the most part, less aware of their rights in relation to energy supply.

In the context of the protection of consumer rights, energy legislation specifically highlights:

- the right to be informed,
- the right to last resort electricity supply, the right to an alternative gas supply and the right to a basic gas supply,
- the right to emergency supply,
- the right to complain to suppliers and to the out-of-court settlement of disputes,
- the right to the protection of rights in administrative proceedings,
- the right to the safe and reliable operation of the system and to a quality supply of electricity or natural gas at a reasonable price.

The Right to be Informed

The Energy Agency is responsible for informing consumers about their rights, the applicable rules and general acts for the exercise of public powers, and the methods for handling complaints regarding the supply of electricity and natural gas; it also publishes all the necessary information for customers on its website through the Single Contact Point. The website also provides access to a comparator of all the offers on the electricity and natural gas markets, which is managed by the Energy Agency. Also in 2022, the Energy Agency kept consumers up-to-date on its website on developments on the retail market and on decisions by some suppliers to cease their activities, advising them to take an active approach to switching supplier in a timely manner and informing them of their rights under the law if they are left without a natural gas supplier.

Suppliers and operators are also responsible for keeping consumers informed. Electricity suppliers must inform the final consumers of the source of the electricity supplied and periodically inform them of their consumption and the characteristics of their consumption. Operators must, in turn, provide end-users with effective access to consumption data. All suppliers of electricity and natural gas must also inform consumers in advance about the general terms and conditions of supply, which they ensure by publishing them on their website. Household and small business consumers of natural gas and household customers of electricity must be informed about any changes to the general terms and conditions of supply relating to the performance of the contract, including changes to the price that could entail an increase in the supply charge, at least one month before they come into force, and other electricity consumers at least two weeks before they come into force, in accordance with the Electricity Supply Act. As a consequence of a change in the general terms and conditions of supply, household or small business consumers may withdraw from the supply contract within one month of the entry into force of the general terms and conditions, without notice or penalty, and must be specifically informed of this right by the supplier in the notice of the change in the general terms and conditions. The notice shall be sent free of charge to the household consumers in the manner specified in the supply contract.

Before connecting to the system, electricity and natural gas distribution system operators must inform consumers that they can choose their supplier freely on the market. To facilitate the choice of supplier, the Energy Agency's website offers a cost of supply comparator, which contains information on package and promotional offers from electricity and natural gas suppliers, price lists, and allows the comparison and calculation of the cost of supply on a monthly or annual basis. The comparator is aimed at residential and small business consumers and allows them to check their monthly electricity or natural gas billing and to calculate the cost of using the network. The Energy Agency's website presents the step-by-step procedure for switching suppliers and also publishes a list of suppliers of a replacement gas supply for the period until 31 August 2024, by individual natural gas distribution system, which are provided by the distribution system operator to consumers eligible for replacement supply.

In 2022, the Energy Agency checked:

- the adequacy of notifying suppliers about price increases for energy products and changes to the general terms and conditions of supply in the field of electricity (Article 15 of the Electricity Supply Act – ZOEE) and natural gas (Article 15 of the Gas Supply Act – ZOP), and no breaches of the provisions were found. The suppliers informed their consumers about the envisaged price increases of energy products in due time, i.e. at least one month before the price increase for natural gas or, for electricity price increases, at least one month before the price increase for household consumers and two weeks before the price increase for the remaining final consumers. Notifications of the envisaged price increases of energy products were initially provided to final consumers in accordance with the agreements resulting from the general terms and conditions of supply or the supply contracts (by regular mail or e-mail), and later on by the suppliers as an integral part of the invoice for the energy supplied, which was sent to the consumers one month before the effective date of the price increase of the energy product;
- the suppliers' compliance with the Government's decrees on the fixing of natural gas and electricity prices, where no breaches of the provisions of the energy legislation (ZOEE and ZOP) were found. The Energy Agency received several complaints and questions from consumers regarding the implementation of the Regulations in question, which were submitted to the Market Inspectorate as the competent authority.

The Right to Last Resort, Substitute, Basic and Emergency Supply

The Right to Last Resort for Electricity Consumers

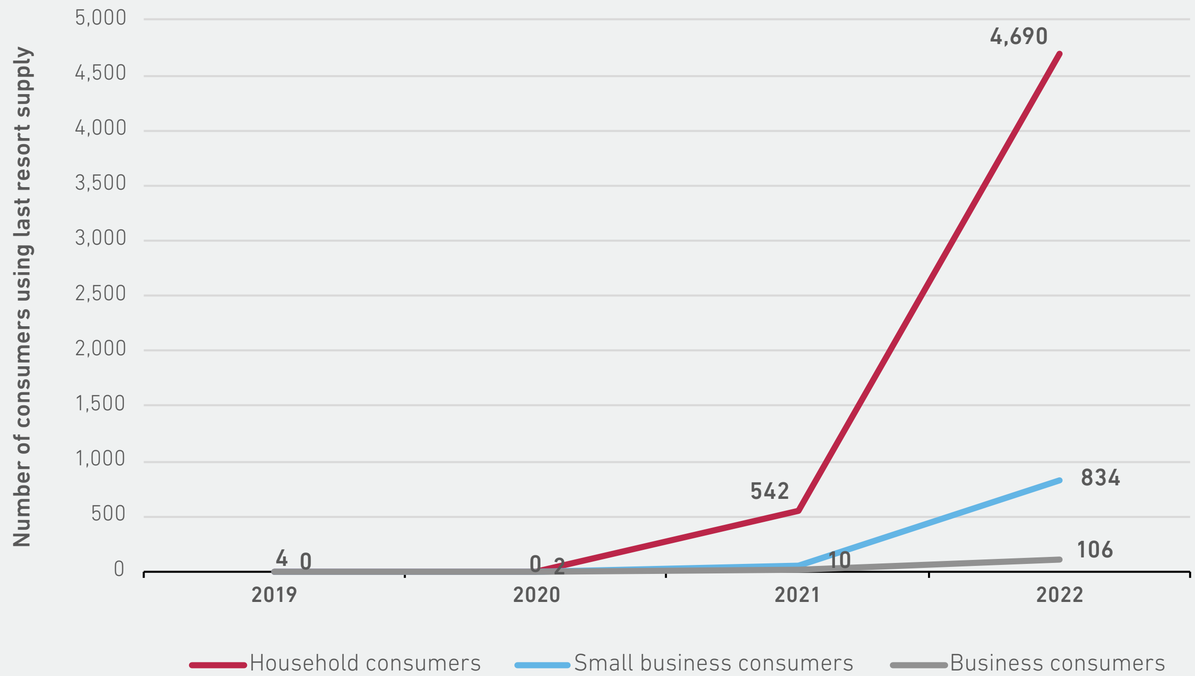
The last resort supply of electricity is provided by the electricity DSO when the supply contract of household or small business customers is terminated as a result of measures resulting from the insolvency or illiquidity of the supplier, or at the explicit request of household and small business customers of electricity, of which they shall be duly informed. With the adoption of the ZOEE, the electricity distribution system operator shall also ensure an emergency supply to final customers if the supplier loses its status as a member of the balancing scheme in accordance with the regulation governing the operation of the electricity market. The price of electricity for last resort supply is regulated on the basis of the provisions of the EA-1, determined by the electricity DSO and publicly announced. The price must be higher than the market price for supply to a comparable customer, as this encourages the quickest possible choice of an alternative supplier and ensures the separation of regulated activities from market activities, though the price of the last resort supply must not exceed the market prices by more than 25%. If the electricity DSO does not set a price or sets it contrary to the rules, the price is set by the Energy Agency.

5630 electricity consumers on last resort supply

The number of customers supplied under last resort supply conditions increased in 2022 compared to 2021. On an annual basis, 5291 end-users were on emergency supply for reasons on the supplier's side, with the highest number, 1506, in January.

In March 2022, the market operator terminated the balance contract of one of the suppliers (Elektro prodaja E.U.), as a result of which all the customers of this supplier, as well as the customers of the electricity suppliers Adriaplin and Energija direkt that were in the balance group of Elektro prodaja E.U., were left without a supplier. All the customers of these suppliers (a total of 829 final consumers, of which 741 were household consumers) were switched to last resort supply as of the following day.

FIGURE 241: LAST RESORT SUPPLY BY YEAR

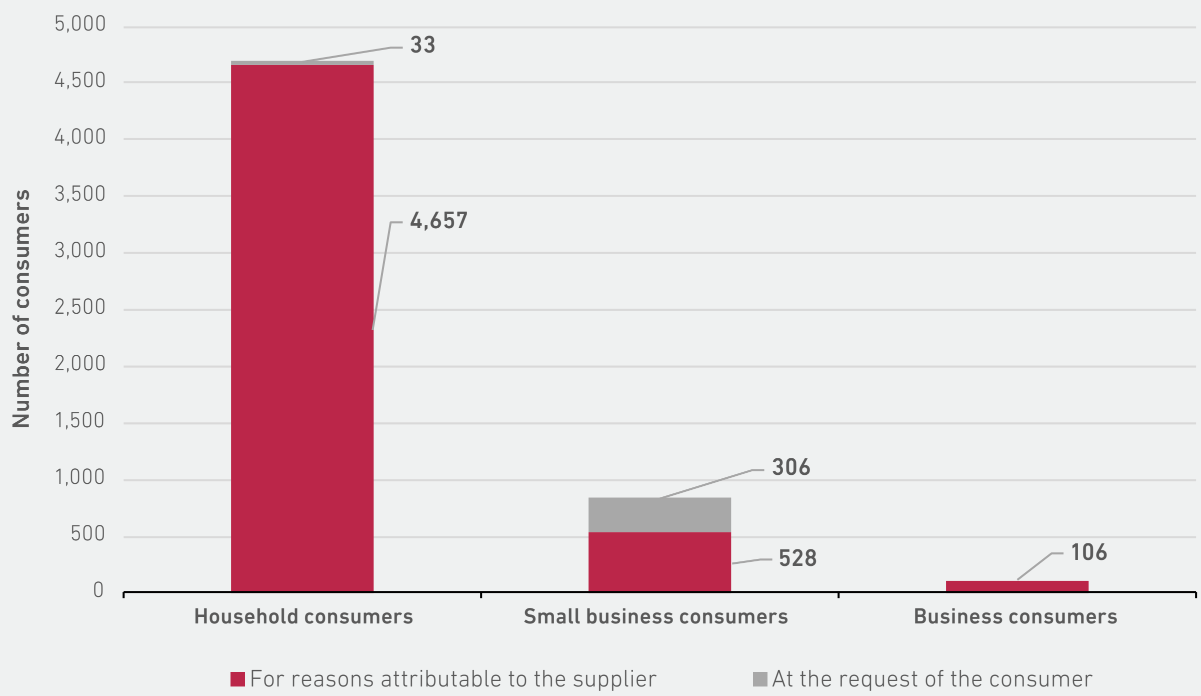


SOURCES: ENERGY AGENCY, ELECTRICITY DISTRIBUTION COMPANIES

At the explicit request of household and small business electricity customers, the DSO in 2022 also supplied 339 consumers (33 household consumers and 306 small business consumers).

The last resort supply in 2022 by consumer group can be seen in Figure 242.

FIGURE 242: REASONS FOR INITIATING LAST RESORT SUPPLY



SOURCES: ENERGY AGENCY, ELECTRICITY DISTRIBUTION COMPANIES

The Right to Substitute Gas Supply

With the amendment of the ZOP in September 2022, alternative gas supply was introduced. While last resort supply in the electricity sector is carried out by the electricity distribution system operator, alternative gas supply is carried out by gas suppliers appointed by the Energy Agency. Household consumers, small business consumers, common household consumers and protected[171] consumers 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 the substitute supply may be higher than the market price for the supply of gas to a comparable consumer, but may not exceed the marginal purchase price for gas on the balancing market published by the gas TSO by 25%. The price of gas for the substitute supply must be determined and published by the substitute supplier at least on its website, and inform the Energy Agency thereof.

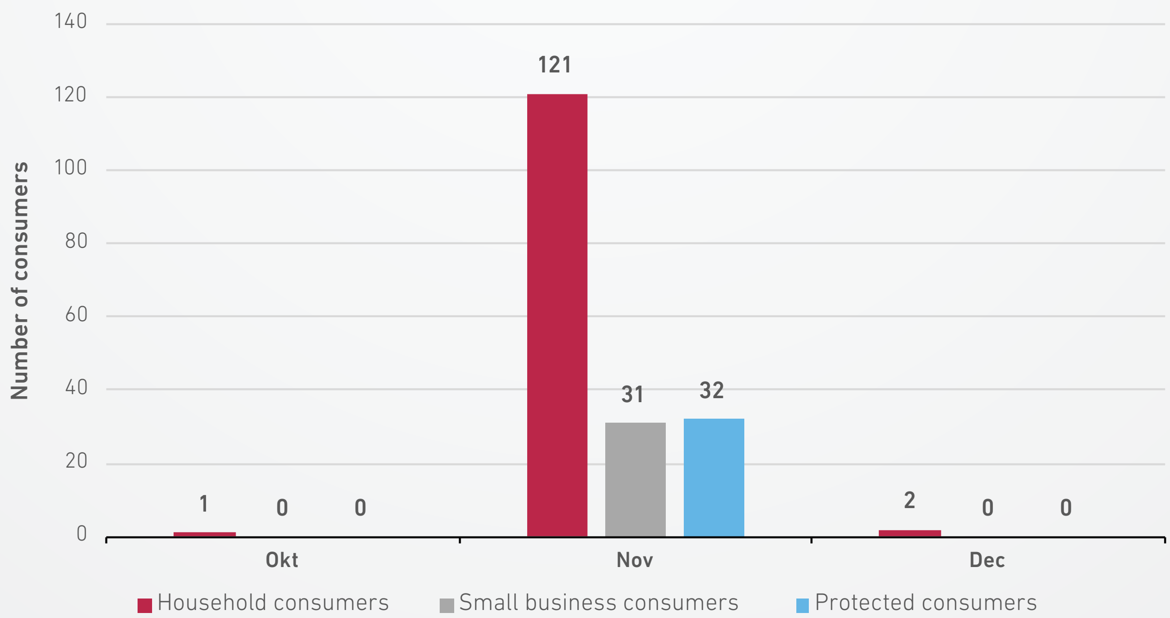
In 2022, the Energy Agency designated five suppliers of substitute supply (Adriaplin, Energetika Ljubljana, GEN-I, Petrol and Plinarna Maribor), which are obligated to carry out this activity until 31 August 2024 and to publish the calculation of the gas price for substitute supply, as well as to set the general terms and conditions of this supply. In order to protect all the consumers of this energy product, the Government has capped the price of the substitute supply at the maximum permissible retail price until 1 August 2023.

Five suppliers of substitute supply have been appointed

Consumers were only entitled to substitute supply from October 2022. The largest number of consumers were supplied under the conditions of substitute supply in November 2022 (a total of 184 consumers), as the company Domplan ceased its natural gas supply activities on 1 November 2022 and all customers who had not concluded a supply contract with a new supplier were automatically switched to the gas substitute supply. Common household consumers were not supplied under the terms of the gas substitute supply in 2022.

The substitute gas supply by consumer group in 2022 can be seen in the following Figure.

FIGURE 243: SUBSTITUTE GAS SUPPLY IN THE OCTOBER–DECEMBER 2022 PERIOD



SOURCES: ENERGY AGENCY, ELECTRICITY DISTRIBUTION COMPANIES

171 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.

In September 2022, the company E.ON also stopped supplying gas; however, if the customers had not concluded new supply contracts on their own, it arranged for the transfer of their supply contracts to the company ECE. Komunalno podjetje Velenje also ceased its gas supply activities on 1 October 2022.

The Right to a Basic Gas Supply

In 2022, unacceptable practice was detected on the retail gas market, as certain consumers failed to supply offers or suppliers were unwilling to enter into supply contracts despite demand. These problems were solved by changing the ZOP and introducing »basic supply«. All natural gas suppliers are obliged to provide a gas supply to consumers without the supply contract upon their request or they must not refuse to conclude a contract. The price of the basic supply is set by the suppliers, and the price of gas for the basic supply may be higher than the market price of gas for comparable new customers of the supplier, up to a maximum of EUR 20/MWh. If customers 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 the supply contract for those customers in accordance with the published General Supply Conditions and the supply contracts entered into.

The Right to Electricity and Gas Emergency Supply

If a consumer is unable to pay the costs of the electricity and natural gas supply due to poor financial circumstances and their life and health or the life 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.

Only two beneficiaries of emergency natural gas supply

In the field of electricity supply, there was not a single beneficiary

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 consumer 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 natural gas distribution system operator of the intended disconnection and that the decision procedure has not yet been completed with the CSD.

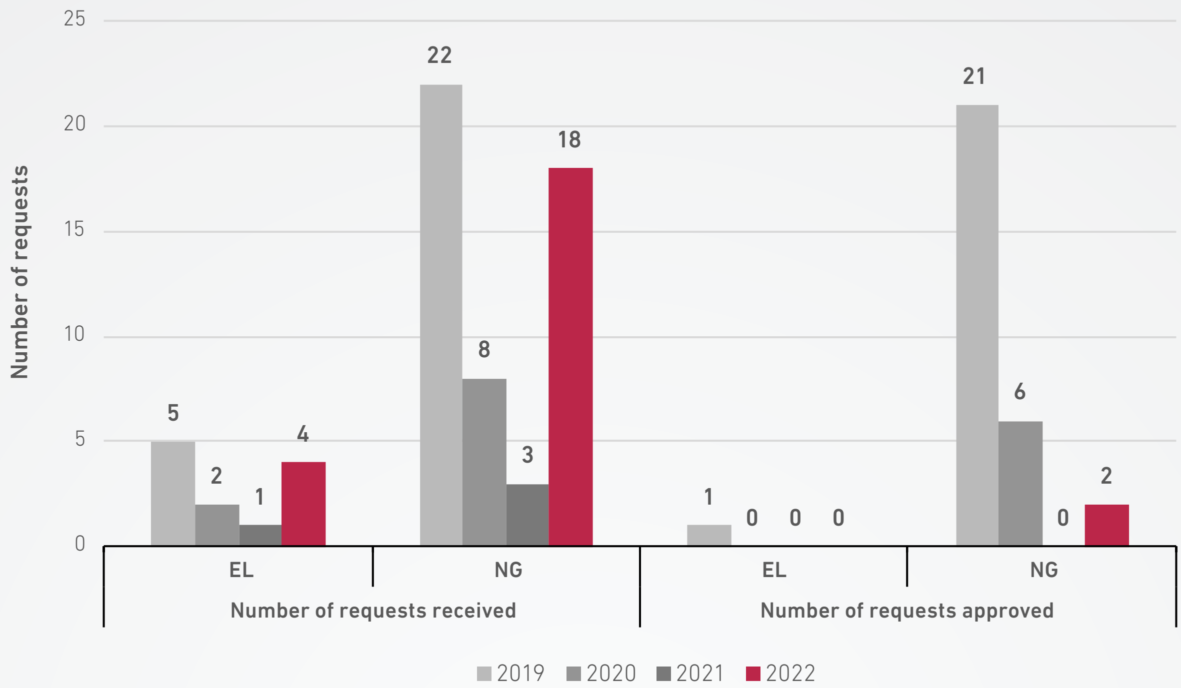
All DSOs must inform household consumers of their right to an emergency supply, the conditions under which it is possible and the deadlines for submitting evidence before disconnection.

The costs of an emergency supply of electricity to vulnerable consumer are eligible costs of the electricity DSO, while in the case of the supply of natural gas, the costs of the emergency supply are borne by the natural gas DSO until they are paid by the vulnerable consumer.

Eligibility for emergency supply is assessed by the electricity 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 2022, the operator of the electricity DSO received four requests for the approval of emergency supply, which were not granted. The two natural gas DSOs received a total of 18 requests, with gas disconnection postponed for only two customers. A comparison of submitted and approved requests for the postponement of disconnection and the enforcement of the right to emergency care in the last four years is shown in Figure 244.

FIGURE 244: COMPARISON OF THE REQUESTS RECEIVED AND GRANTED FOR THE POSTPONEMENT OF DISCONNECTIONS AND EXERCISE OF THE RIGHT TO AN EMERGENCY SUPPLY



SOURCES: ENERGY AGENCY, OPERATORS

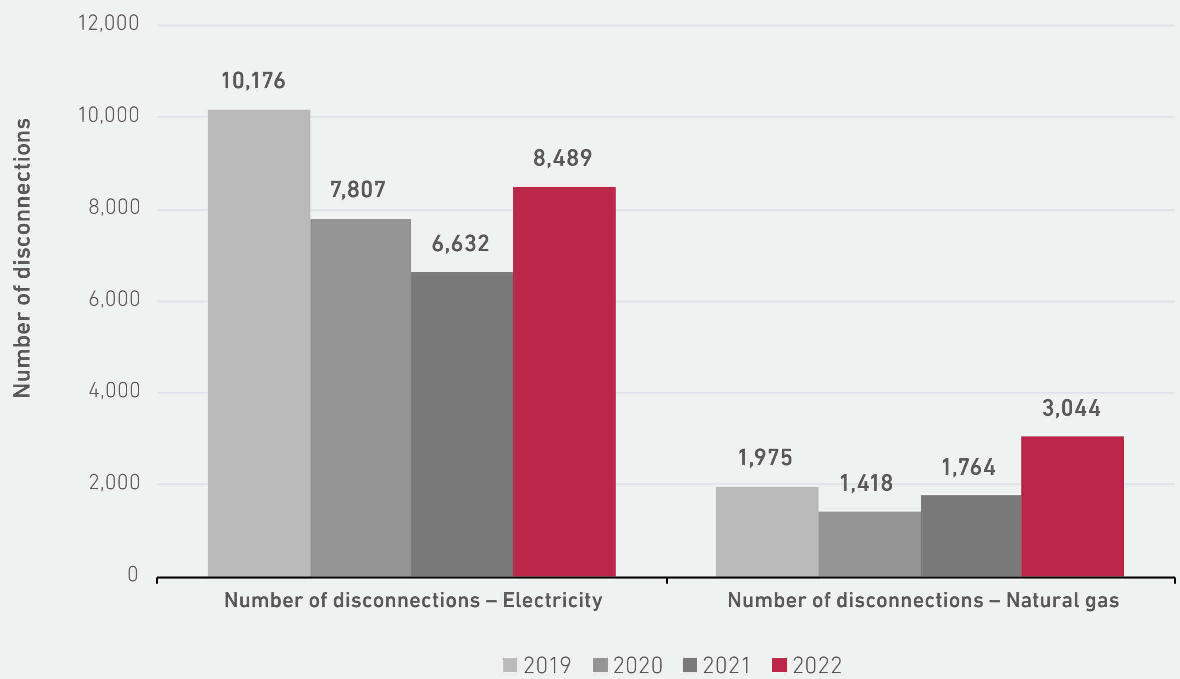
If the application for an emergency supply is not approved and a consumer fails to pay the energy supply bill, disconnection follows. Given that the cost of an emergency supply is paid by all the other electricity consumers through the network charge, the eligibility criteria for an emergency supply 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.

Disconnections of Customers

The disconnection of a consumer is one of the last resort methods of correcting infringements caused by the consumer's behaviour. The electricity or natural 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 their request.

The number of electricity disconnections rose again in 2022, but did not reach the number of disconnections in 2019. In the gas sector, 2022 saw the highest number of disconnections compared to the last three years. In both electricity and natural gas, disconnections of household consumers are still the most common. A comparison of the number of disconnections of final consumers over the last four years is shown in figure 245.

FIGURE 245: COMPARISON OF THE NUMBER OF DISCONNECTIONS OF FINAL CONSUMERS



SOURCES: ENERGY AGENCY, OPERATORS

The most common reason for the disconnection of an electricity consumer is non-payment and thus the termination of the supply contract (disconnection after prior notice), while in the field of natural gas, most disconnections were made at the request of the final consumer.

Under the ZOEE and the ZOP, electricity and natural gas distribution system operators are required to give at least 10 days' notice to household consumers and at least eight days' notice to commercial customers of the intended disconnection. During this period, consumers may remedy the reasons why they are threatened with disconnection and household consumers may exercise any right to an emergency supply. In this case, household and small business electricity customers may also request the electricity DSO to provide them with an emergency supply. In 2022, 92% of all cancellations of natural gas supply contracts to household consumers were cancelled due to the immediate payment of the debt, compared to 96.2% in the electricity sector.

If the consumer fails to pay the debt, disconnection follows. In 2022, 8489 final consumers were disconnected from the electricity system and 3044 from the gas system for non-payment.

The following figure shows the process of disconnection due to the termination of a supply contract by the supplier for non-payment, other disconnections and the consequences of termination or disconnection.

FIGURE 246: DISCONNECTION PROCEDURE

DISCONNECTIONS

EL (8,489)			NG (3,044)		
HC	SBC	BC	HC	SBC	BC
6,259	1,994	236	2,743	241	60

Disconnection without prior notice

EL	NG
192	24

Disconnection upon prior notice

EL	NG
5,213	244

One of the most common reasons for initiating this procedure is the termination of a supply contract because the consumer has failed to pay an obligation to the supplier (non-payment).

Disconnection at the consumer's request

EL	NG
3,084	2,776

Cancellation of the supply contract

	EL			NG		
	HC	SBC	BC	HC	SBC	BC
Non-payment	62,842	12,713	1,925	925	201	39
Other reasons	2,004	270	147	1,258	32	1

Payment of the debt

Fails to pay the debt

Cancellation of supply contract termination

	EL			NG		
	HC	SBC	BC	HC	SBC	BC
All cancellations	59,948	11,875	2,312	1,000	199	75
Payment of the debt	57,681	10,981	2,141	928	195	74

Disconnection

Reconnection of household consumers

	EL	NG
Reconnection within three weeks	1,470	39
Reconnection in the second week after disconnection	220	27
Reconnection within one week	2,849	108
Reconnection after three weeks	112	20

SOURCES: ENERGY AGENCY, OPERATORS, SUPPLIERS

The Right of Complaint and the Out-of-Court Settlement of Consumer Disputes with Suppliers and the Right of Complaint with Operators

Complaints and Out-of-Court Consumer Dispute Settlements with Energy Suppliers

33% more complaints from household consumers of natural gas

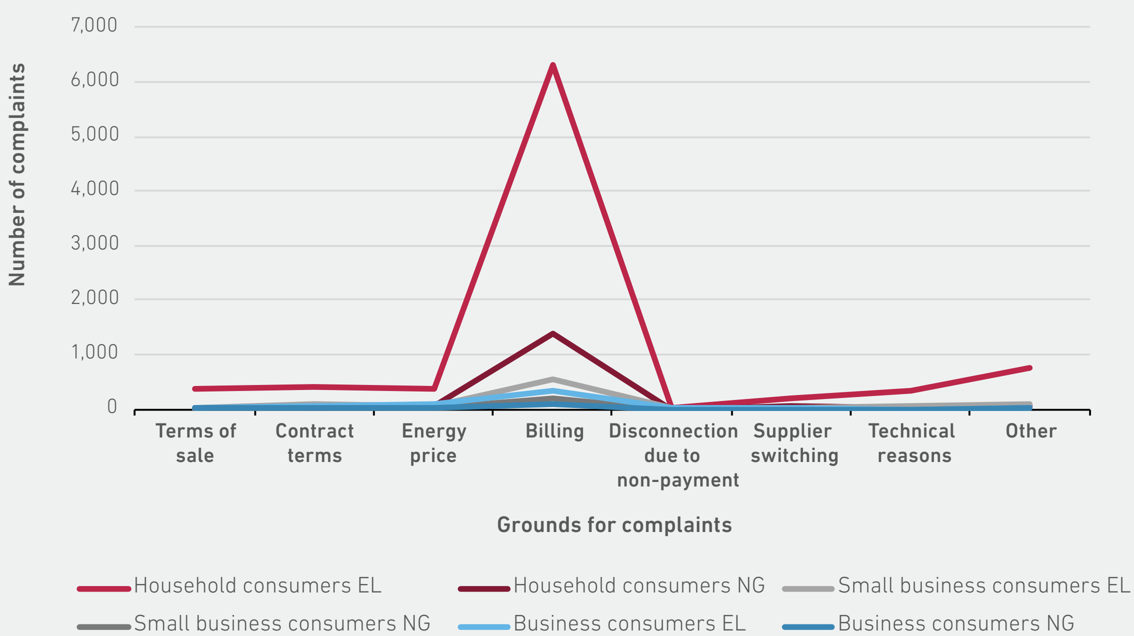
All consumers have the right to complain to their energy supplier. Disputes between small or large business consumers on the one hand and energy suppliers on the other are settled first with the individual supplier and then before the competent court. For electricity end-users other than household consumers, 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.

The number of complaints by household electricity and natural gas consumers increased compared to the previous year, by 5% for electricity with 8,776 complaints, and by 33% for gas with a total of 1,606 complaints.

The majority of all consumer complaints were related to invoices issued by the energy supplier, which partly also contain complaints about the measured quantities of energy consumed or electricity delivered, on the basis of which the billing is carried out and for which the operators of the electricity and natural gas distribution systems are responsible, who communicate this information to the energy suppliers (the disagreement with the measured quantities of energy is reflected in the number of complaints against the invoice).

The majority of complaints were submitted by household consumers, with the number of complaints lodged in the electricity sector being significantly higher than in the natural gas sector. The figure below shows the number of complaints by electricity and natural gas consumers against energy suppliers in 2022, broken down by reasons.

FIGURE 247: CONSUMER COMPLAINTS AGAINST SUPPLIERS BY REASONS

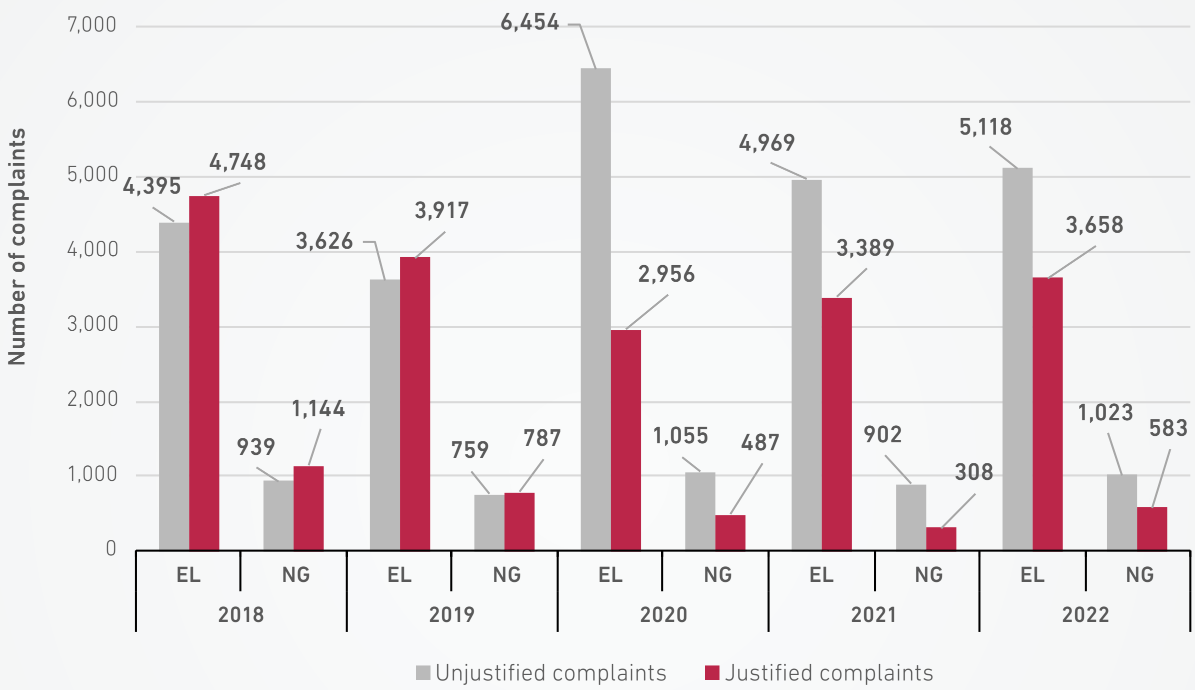


SOURCES: ENERGY AGENCY, SUPPLIERS

While in previous years, the majority of complaints were upheld by suppliers, this trend was reversed in 2020 and continued in 2021 and 2022. For electricity, 58% of all complaints received were unjustified, while for natural gas, 64% of such complaints were unjustified. Figure 248 shows the decisions taken by energy suppliers on complaints from household electricity and natural gas customers, according to the justification of the complaint.

The majority of complaints from household consumers were unjustified

FIGURE 248: SUPPLIERS' DECISIONS ON THE ELIGIBILITY OF COMPLAINTS BY HOUSEHOLD CONSUMERS IN THE 2018–2022 PERIOD



SOURCES: ENERGY AGENCY, SUPPLIERS

Only two household electricity consumers whose complaints were rejected by the supplier as unjustified continued with the out-of-court consumer dispute resolution provider, while in the field of natural gas, there were no requests for an out-of-court consumer dispute resolution provider in 2021. Although electricity and natural gas consumers are aware of this dispute resolution option, they do not use it.

Potential breaches of the general consumer protection rules in Slovenia are also monitored and sanctioned by the Market Inspectorate of the Republic of Slovenia, but with the amendment in 2019 and later with the adoption of the ZOEE and the ZOP, the competencies with regard to monitoring unfair commercial practices relating 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,

were transferred from the Market Inspectorate of the Republic of Slovenia to the Energy Agency.

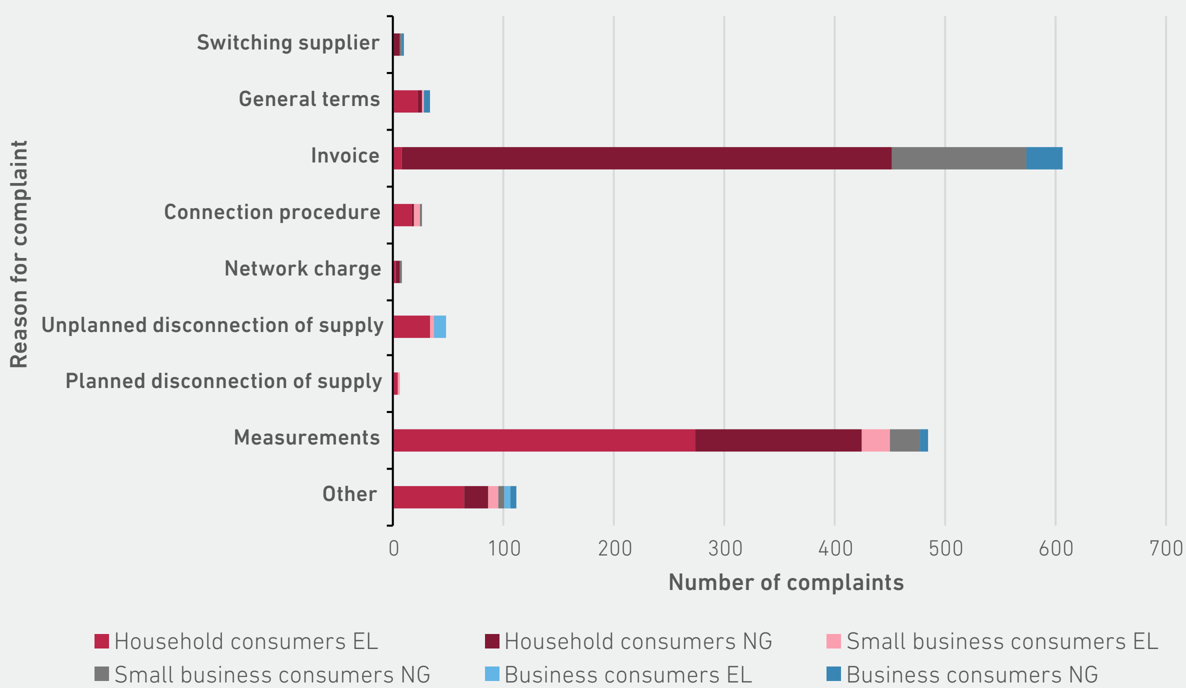
Consumer Complaints to Electricity and Natural Gas Distribution System Operators

In the event of a disagreement with the operator regarding billing, metering, network charges, supply interruptions, connection procedures, switching supplier, etc., consumers 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 in accordance with the procedures described in more detail in the following chapter.

48% fewer complaints from electricity consumers

In 2022, a total of 485 complaints from electricity consumers (445 fewer than in the previous year) were lodged directly with the electricity DSO and 845 complaints (117 fewer than in the previous year) were lodged with natural gas DSOs. The majority of the complaints to electricity and natural gas DSOs were made by household consumers (419 electricity and 638 natural gas), with the majority of complaints in 2022 relating to metering in the electricity sector and billing in the natural gas sector.

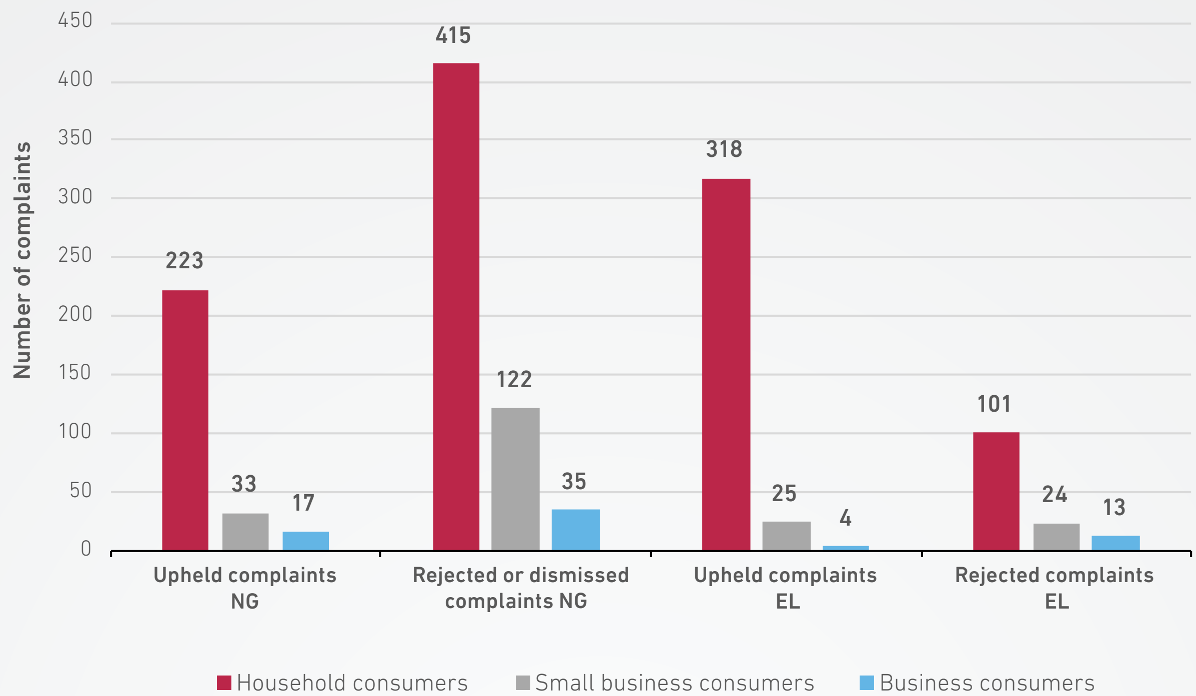
FIGURE 249: NUMBER OF CONSUMER COMPLAINTS TO OPERATORS BY CONTENT



SOURCES: ENERGY AGENCY, OPERATORS

Figure 250 shows the number of approved and rejected complaints against electricity and natural gas distribution system operators. Out of a total of 485 complaints filed by all electricity consumers, 72% or 347 were upheld and the rest were rejected (138). In the field of natural gas, the trend is reversed, with the majority of complaints being rejected, with operators upholding only 32% of the complaints filed, or 273, and the rest being rejected or dismissed (572).

FIGURE 250: NUMBER OF COMPLAINTS DEALT WITH BY OPERATORS



SOURCES: ENERGY AGENCY, OPERATORS

In the case of natural gas, there were no complaints in 2022, while in the case of electricity, business consumers on closed distribution systems made a total of five complaints (two related to the invoice and three to the network charge), which are not included in the figures above.

The Right to the Protection of Rights in Administrative Procedures

In addition to electricity or natural gas consumers, suppliers of electricity or natural gas may also submit a request for dispute settlement before the Energy Agency. These are disputes that these eligible entities bring before the Energy Agency in relation to electricity and natural gas transmission system operators, electricity and natural gas distribution system operators, or the electricity market operator, whereby they must first follow the procedure set out in the EZ-1 before submitting a request for a decision to the Energy Agency.

Disputes falling within the competence of the Energy Agency are disputes relating to access to the system, the amount charged for the use of the system, breaches of the system operating instructions and established deviations, and disputes relating to breaches of the rules in the field of self-supply.

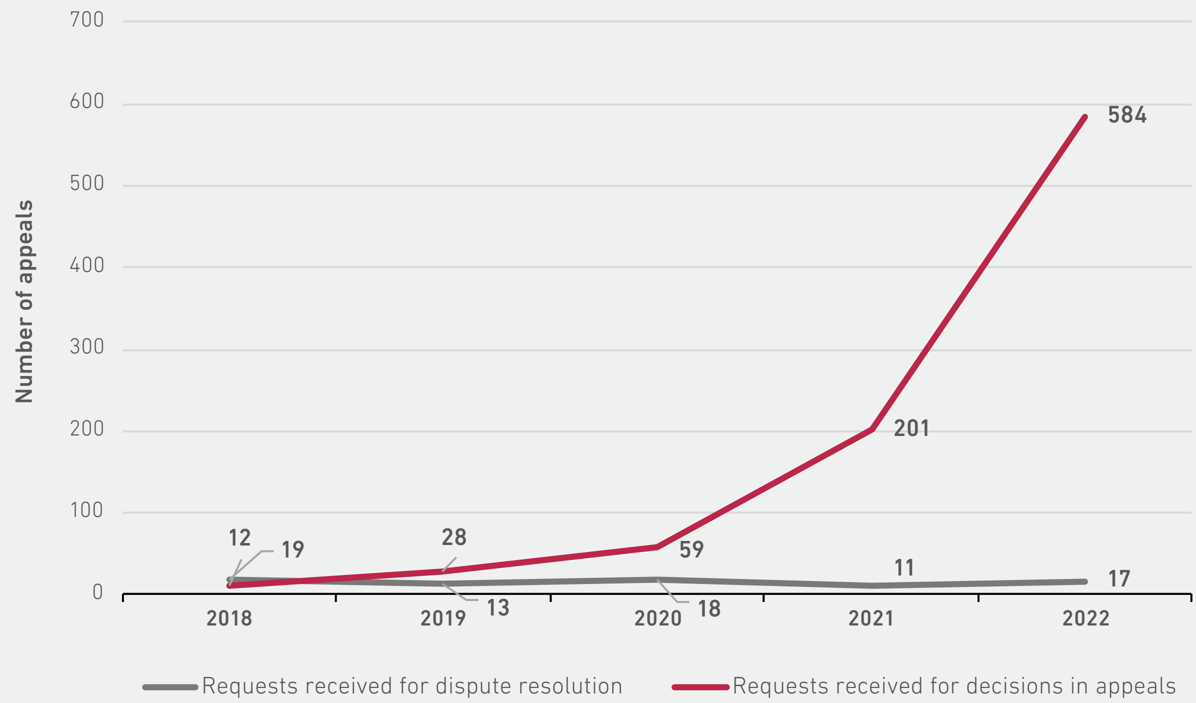
Administrative procedures before the Energy Agency are fast and free of charge. A decision on a dispute settlement request is made within two to four months.

95.2% of all complaints related to the refusal of consent to connect a self-supply installation to the electricity distribution system

In 2022, the Energy Agency dealt with 643 individual cases, 18 at first instance and 625 at second instance. Almost all of the complaints (595 out of the total of 625 complaints dealt with) were related to the refusal of consent for the connection of a self-supply generating installation to the electricity distribution system.

In the last two years, there has been a significant increase in the number of complaints received as a result of numerous refusals to grant consent for the connection of a self-supply generating installation. The number of appeals has increased by almost 990% since 2020, as shown in Figure 251.

FIGURE 251: ENERGY AGENCY DECISIONS IN DISPUTES AND APPEALS IN THE 2018–2022 PERIOD



SOURCE: ENERGY AGENCY

The Right to the Safe and Reliable Operation of the System and the Quality of Supply

All consumers have the right to the safe and reliable operation of the system and to a quality supply of electricity and natural gas provided by the electricity and natural gas system operators in accordance with the system operating instructions to which the Energy Agency gives its consent.

At the system level, the quality of 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 also regulates the quality of supply by publishing data and analyses, which are made public in the Quality of the Electricity Supply Report. For more information, see the section on voltage quality in the electricity sector.

In 2022, the natural gas system operators continued to ensure reliable and safe operations for a smooth and quality supply by carrying out regular and emergency maintenance.

More details are provided in the chapter on the quality of the electricity supply and in the chapter on safe and secure operation and the quality of the natural gas supply.

ENERGY EFFICIENCY

Lower costs, less pollution, more reliable energy supply

ENERGY SUPPLIERS ACHIEVED

312 GWh
OF ENERGY SAVINGS

416 GWh
SAVINGS

ACHIEVED UNDER THE ALTERNATIVE MEASURE

728 GWh
OF SAVINGS

ACHIEVED THROUGH EFFICIENCY MEASURES

IN INDUSTRY ACHIEVED

119 GWh

OF ENERGY SAVINGS,

38% OF THE TOTAL ENERGY SAVINGS ACHIEVED BY ENERGY SUPPLIERS

REDUCTION OF ANNUAL CO_2 EMISSIONS BY

120,022 TONNES,

MOSTLY IN INDUSTRY

92 GWh

OF TOTAL ENERGY SAVINGS

GENERATED BY THE CHP MEASURE

THROUGH ENERGY EFFICIENCY MEASURES

98%

OF ALL LARGE COMPANIES

COMPLY WITH ENERGY AUDITS

OVER THE ENTIRE SAVINGS REPORTING PERIOD 2016–2022, THE HIGHEST SAVINGS WERE ACHIEVED IN INDUSTRY, WHILE THE LOWEST SAVINGS WERE ACHIEVED IN THE PRIVATE AND PUBLIC SECTORS.

ENERGY EFFICIENCY

Energy efficiency, which increases the quality of energy services while reducing energy inputs, is one of the cornerstones of the transition to a climate-neutral society. It is also one of the most cost-effective measures to achieve the objectives of a sustainable energy policy and will have a crucial impact on the future competitiveness of the Slovenian economy and society in general. At the same time, it will contribute to reducing energy dependence and thus increasing energy security.

Slovenia's binding target under the NEPN is to improve energy efficiency by at least 35% by 2030, which means that if the adopted policies and measures in the field of efficient use are systematically implemented, the final energy consumption in 2030 will not exceed 54.9 TWh (4717 ktoe). This means that Slovenia is committed to a primary energy consumption in 2030 of no more than 73.9 TWh (6356 ktoe) and an energy efficiency increase of at least 35% compared to the 2007 baseline scenario, despite the EU target of 32.5%.

The energy efficiency policy objectives are being implemented in Slovenia through measures to promote energy efficiency in all end-use sectors, as well as in the energy conversion, electricity distribution and transmission sectors, including efficient district heating and cooling networks.

Slovenia achieves most of its energy savings to meet its energy efficiency targets through the implementation of measures under the mandatory energy savings scheme, which binds energy suppliers to end-users, and the alternative energy efficiency measures programme, implemented by the Eco Fund.

The Energy Savings Obligation Scheme and Alternative Measures

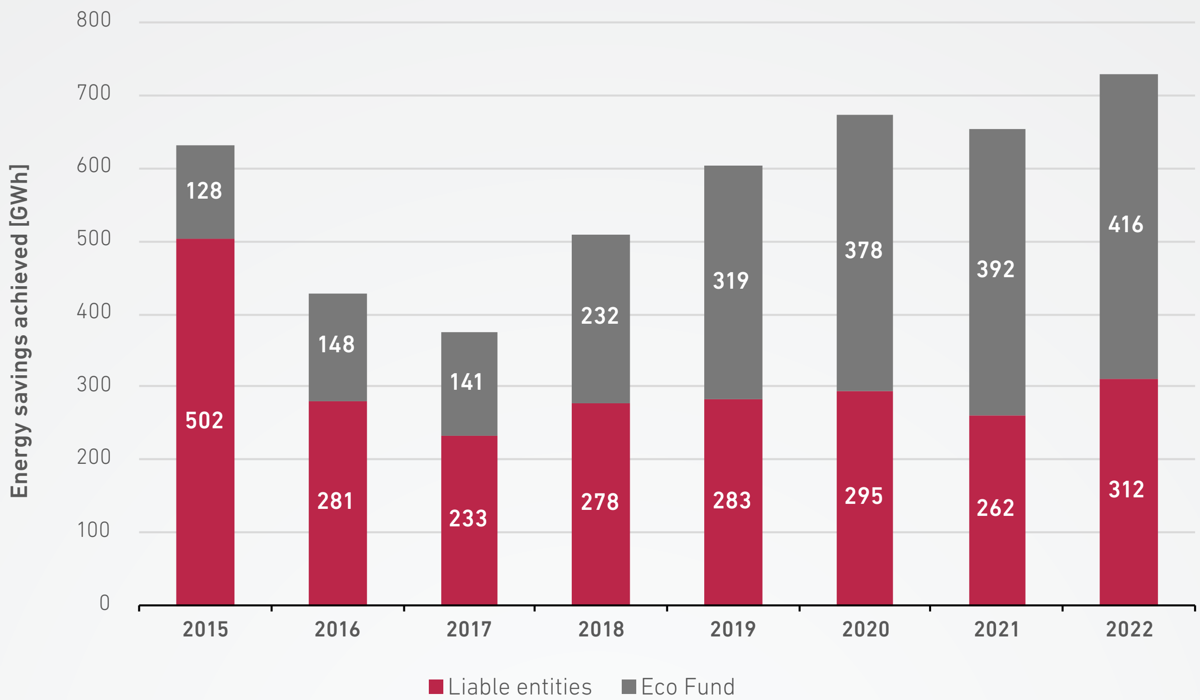
Under the mandatory energy savings target, Slovenia must achieve 0.8% annual savings in final energy consumption. In doing so, the country has taken advantage of the transitional period to allow liquid fuel suppliers to gradually increase their annual savings until 2026, when they will also be required to achieve annual final energy consumption savings of 0.8% compared to the previous year's sales volumes, while in 2021 they were required to achieve 0.3% on the volumes of energy sold in the previous year. In 2022, the scheme obliged these entities to save 0.4% of the quantities of energy products sold in 2021.

Among the energy savings, we need to include those generated by the alternative measure implemented under the Eco Fund Energy Efficiency Programme. The programme is financed through funds collected from final energy consumers as part of the energy efficiency contribution.

728 GWh of energy savings achieved in 2022 with energy efficiency measures or 11% more than in 2021

These two measures together generated savings of 728 GWh, 74 GWh more than the savings achieved in 2021. In this respect, the Eco Fund achieved savings of 416 GWh, exceeding the savings of the previous year by 24 GWh, while the obliged parties realised savings of 312 GWh, 50 GWh more than in 2021.

FIGURE 252: ENERGY SAVINGS ACHIEVED IN THE 2015–2022 PERIOD



SOURCES: ENERGY AGENCY, ECO FUND

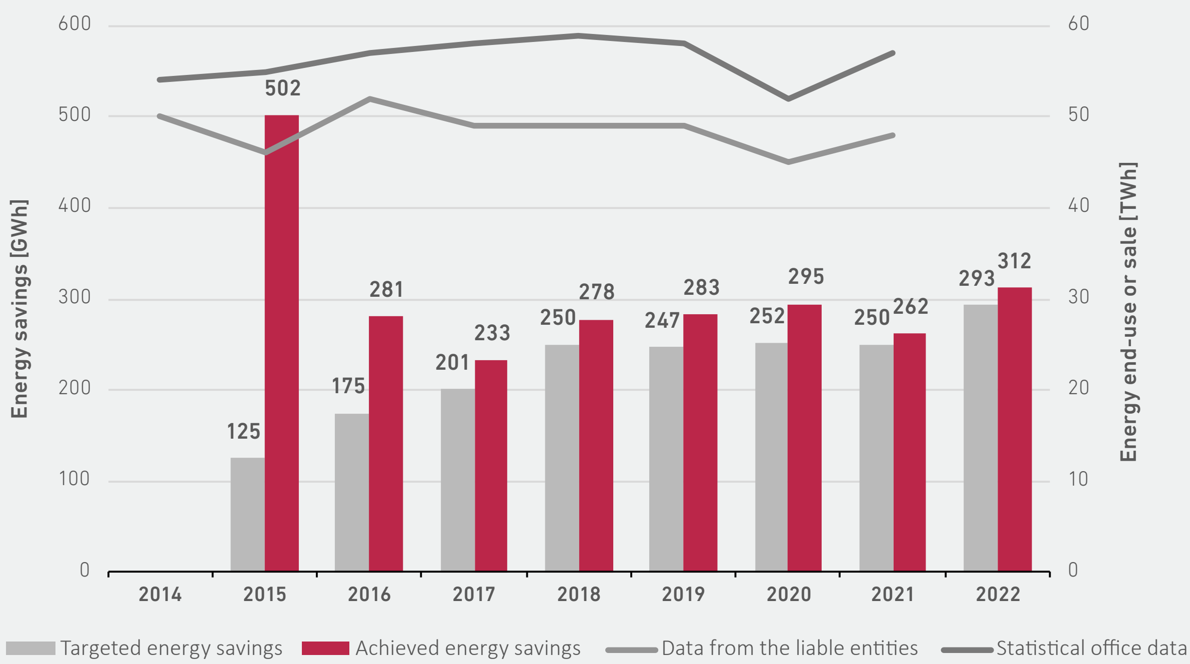
Target Energy Savings of the Liable Entities

The energy savings obligation is imposed on suppliers of electricity, heat, natural gas and liquid and solid fuels to final customers, who were required to contribute to the implementation of energy efficiency measures in 2022 by delivering annual energy savings of 0.8% of the energy sold to final customers in 2021. This obligation is exempted for suppliers of liquid fuels, who were required to deliver annual savings of 0.4% of petrol and diesel. However, since 2020, suppliers of solid fuels to final customers, who supply less than 100 MWh of energy per year are exempted from the mandatory savings scheme.

According to the reported data, liable entities sold 47,668 GWh of energy to final customers in 2021. Of this, 22,033 GWh of petrol and diesel were sold. The 0.4% savings target for 2022 from the sale of liquid fuels was therefore set at 88 GWh. The 0.8% savings target for 2021 from the sale of electricity, heat, natural gas and liquid and solid fuels to final customers (25,635 GWh) was set at 205 GWh for 2022. The 2021 savings from the sale of electricity, heat, natural gas and liquid and solid fuels to final customers (25,635 GWh) was set at 205 GWh. The total savings target for 2022 was therefore 293 GWh, 43 GWh more than the 2021 savings target, as the energy suppliers sold more energy products in 2021 than in 2020 according to the reported data, and the share of the savings target for liquid fuels was increased again from 0.3% in 2021 to 0.4% in 2022.

Figure 253 shows the volume of energy sold to final customers and a comparison with STAT data on final energy consumption, as well as the targeted and achieved energy savings in the 2015–2022 period.

FIGURE 253: COMPARISON OF THE FINAL ENERGY CONSUMPTION AND SOLD ENERGY DATA FROM THE LIABLE ENTITIES AND STAT IN THE 2014–2021 PERIOD AND THE TARGETED AND ACHIEVED SAVINGS IN THE 2015–2022 PERIOD



SOURCES: ENERGY AGENCY, STATISTICAL OFFICE OF THE REPUBLIC OF SLOVENIA

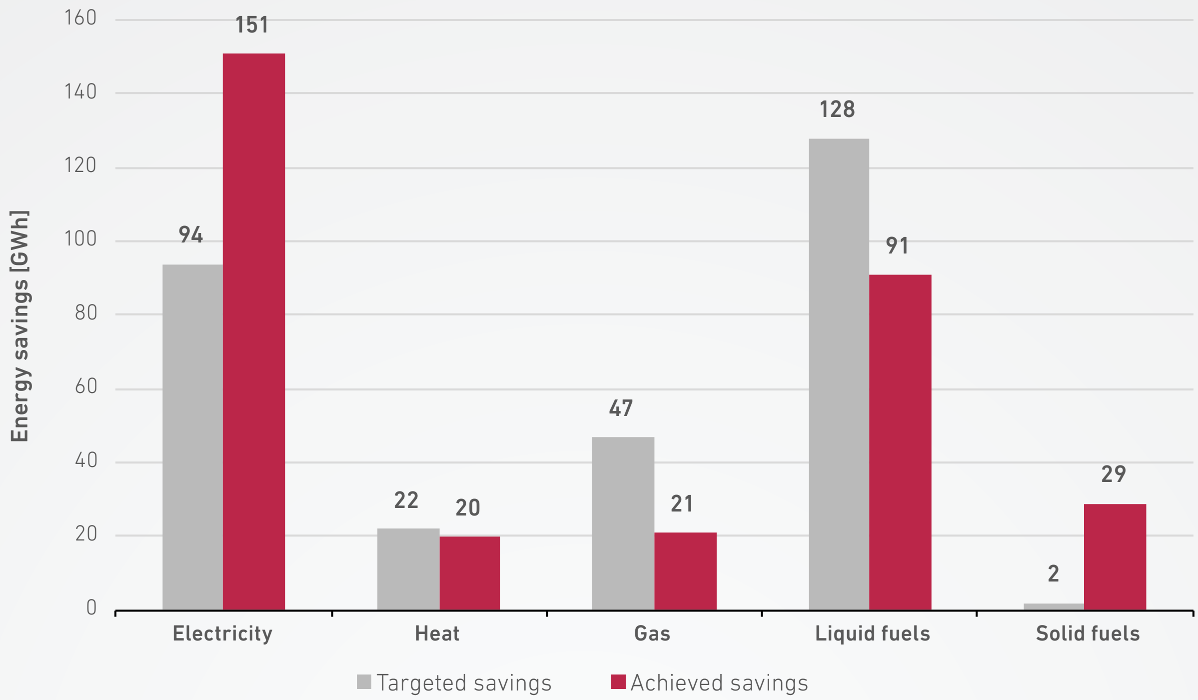
The suppliers' contribution to the implementation of energy efficiency measures resulted in 312 GWh of energy savings in 2022, 6.5% above the savings target, exceeding the annual savings target again this year as in previous years.

Activities of Suppliers to Achieve the Target Energy Savings

In 2022, the majority of the energy suppliers (through participation in the implementation of measures, with their own contribution to the implementation of measures, etc.) contributed to the implementation of energy efficiency measures, with which the target savings for 2022 were exceeded. Suppliers who fail to achieve the target energy savings through their contribution to the implementation of energy efficiency measures may fulfil their obligation to pay financial compensation to the Eco Fund for each megawatt-hour of energy savings not achieved. The compensation value is determined annually by the Eco Fund, in accordance with Article 8(7) of the Act on Energy Efficiency, and for 2022 it amounted to EUR 184.15/MWh.

Figure 254 shows that the electricity suppliers generated the highest savings, 151 GWh, and liquid fuel suppliers 91 GWh of savings. They are followed by solid fuels suppliers with 29 GWh and gas suppliers with 21 GWh. Only electricity and solid fuels suppliers exceeded their savings targets through the measures implemented, while the rest generated savings that do not exceed the savings target for this energy commodity according to the reported energy sales data, as most of these suppliers covered their savings target with the surpluses generated in previous years.

FIGURE 254: TARGETED AND ACHIEVED ENERGY SAVINGS BY THE TYPE OF ENERGY SUPPLIER



SOURCE: ENERGY AGENCY

Energy Savings Achieved by Individual Measures

Suppliers have achieved energy savings by contributing to the implementation of individual energy efficiency measures in industry, the service and public sectors, residential buildings and, in addition, in the energy conversion, distribution and transmission sector. For the set of measures for which suppliers can demonstrate savings, the savings achieved are calculated in accordance with the measure-specific savings calculation methodologies set out in the Rules on the methods for determining energy savings, except for measures where savings must be demonstrated through an energy audit, in which case the savings achieved for each measure are measured.

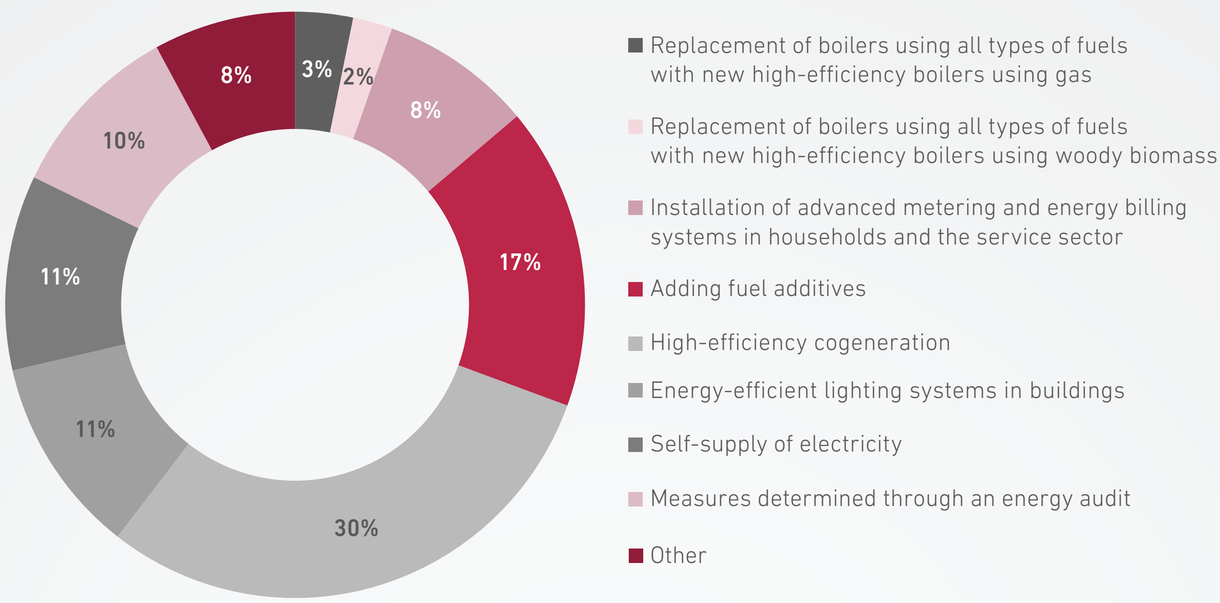
TABLE 43: ENERGY SAVINGS BY INDIVIDUAL MEASURES IN THE 2015–2022 PERIOD

Measure	2015 [GWh]	2016 [GWh]	2017 [GWh]	2018 [GWh]	2019 [GWh]	2020 [GWh]	2021 [GWh]	2022 [GWh]
Complete renovation of buildings	0.0	0.6	0.1	15.9	7.0	7.7	4.0	3.4
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
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
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
Installation of heat pumps for heating	2.7	0.3	1.7	3.5	6.1	2.8	9.7	4.1
Comprehensive renovation of heat stations	73.6	3.1	0.8	1.7	0.5	1.9	2.7	1.8
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
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
Adding fuel additives	195.6	99.2	41.2	53.4	33.3	27.8	41.9	51.4
High-efficiency cogeneration	37.7	9.8	11.9	62.2	78.9	62.2	34.0	92.0
Energy-efficient lighting systems in buildings	14.5	15.5	22.9	42.5	56.8	55.0	44.2	33.6
Implementation of energy management systems	98.3	92.9	93.8	9.7	29.5	3.4	5.4	2.0
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
Self-supply of electricity	0.0	0.0	0.0	0.0	5.0	4.6	24.5	33.1
Measures determined through energy audits	44.9	12.3	7.5	27.1	27.6	75.4	48.0	30.5
Other	9.8	11.9	19.9	17.8	9.9	14.3	10.5	8.9

SOURCE: ENERGY AGENCY

The data in Table 43 and Figure 255 shows that in 2022, the largest energy savings were generated by CHP systems (30% of total savings), achieved in the industry sector, followed by transport through the addition of fuel additives (16% of total savings). However, energy-efficient lighting in buildings with 33.6 GWh of savings and self-supply with 33.1 GWh of savings also made significant contributions to the savings target.

FIGURE 255: SHARES OF ENERGY SAVINGS ACHIEVED THROUGH INDIVIDUAL MEASURES



SOURCE: ENERGY AGENCY

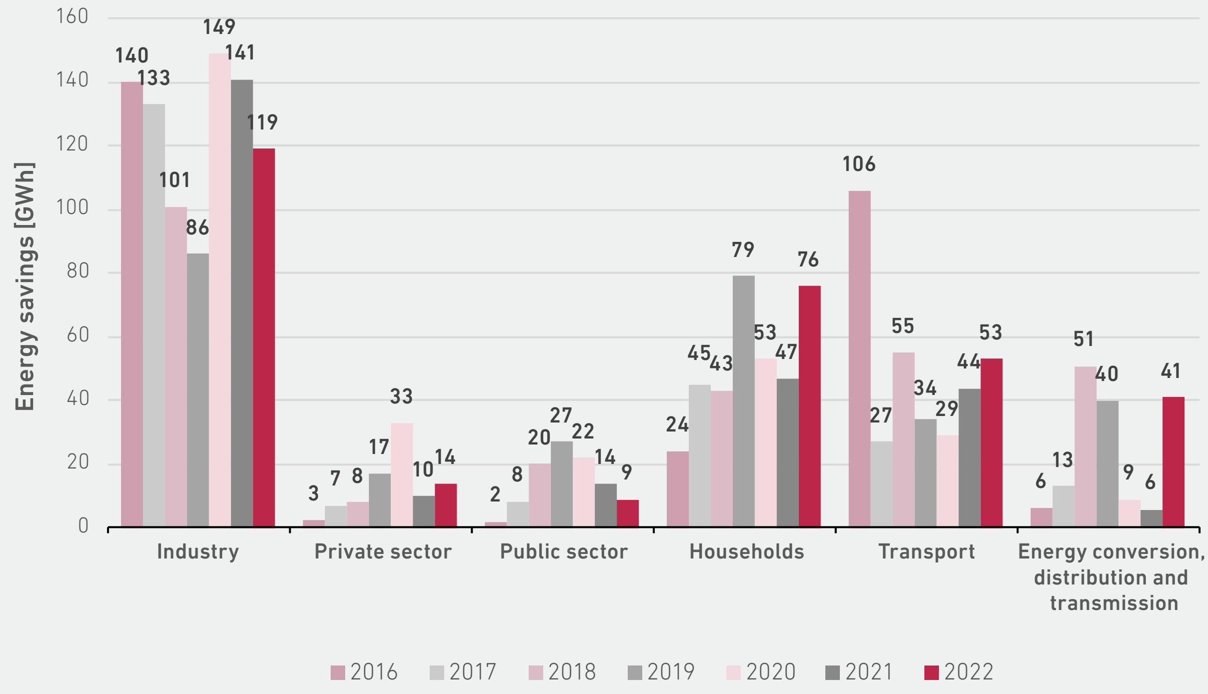
Based on the methodologically determined CO_2 emission reduction calculations for each type of measure, the Energy Efficiency Obligation measures reduced the annual CO_2 emissions by 120,022 tonnes, with the highest reductions in industry, which also achieved the highest savings by sector.

Energy Savings by Sector

In 2022, the largest savings were generated in the industry sector, with 119 GWh, representing 38% of the total energy savings achieved, which was 22 GWh less than the previous year. All other sectors, except for the public sector, also generated more savings in 2022 than in 2021. Again, the lowest savings were generated in the public sector.

Over the whole savings reporting period of 2016–2022, the highest savings were achieved in industry, while the lowest savings were achieved in the private and public sectors.

FIGURE 256: ENERGY SAVINGS BY SECTOR IN THE 2016–2022 PERIOD



SOURCE: ENERGY AGENCY

Energy Savings Achieved Under the Alternative Measure

An alternative measure under the combined scheme to achieve the target share of final energy savings is implemented by the Eco Fund under the Energy Efficiency Improvement Programme.

The Eco Fund achieves energy savings through three systems, 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 2022, a total of 358 GWh of energy savings and 416 GWh of savings through Eco Fund measures were achieved.

TABLE 44: ACHIEVED ENERGY SAVINGS IN THE ECO FUND PROGRAMME FOR IMPROVING ENERGY EFFICIENCY IN THE 2015–2022 PERIOD

	2015	2016	2017	2018	2019	2020	2021	2022
Investment loans [GWh]	5	8	11	24	23	39	44	29
Non-refundable grants [GWh]	123	127	117	190	272	314	323	358
Energy advisory service for the public [GWh]	0	14	14	18	23	25	25	29

SOURCES: ECO FUND ANNUAL REPORTS

Most of the savings achieved by the Eco Fund are achieved through measures implemented by individual investors in households and businesses, partly financed by grants awarded through Eco Fund calls for tenders. In 2022, the most savings were achieved with the following four measures: installation of heat pumps (126.8 GWh), self-supply – NET METERING (62.4 GWh), natural gas condensing boilers (43 GWh) and the thermal insulation of buildings (42 GWh), together accounting for 77% of the total savings from the grants, which generated a total of 358 GWh of savings in 2022, equivalent to 82% of the total savings from the Eco Fund. Due to heat pump installations and self-supply, the savings in 2022 continued to increase compared to previous years.

TABLE 45: ENERGY SAVINGS BY MEASURES FOR THE 2018–2022 PERIOD, PARTLY FINANCED BY ECO FUND GRANTS

	2018 [GWh]	2019 [GWh]	2020 [GWh]	2021 [GWh]	2022 [GWh]
Biomass boilers	18.3	30.6	27.2	26.5	32.4
Heat pumps	63.1	102.7	103.8	99.0	126.8
Self-supply – net metering	10.0	16.3	30.9	58.0	62.4
Installation of joinery	2.9	3.3	4.1	3.6	3.1
Facade thermal insulation	49.9	55.0	48.9	43.2	42.0
Roof thermal insulation	18.0	15.2	13.6	13.5	9.0
Heat recovery ventilation	0.0	2.1	4.2	4.0	4.0
Natural gas condensing boilers	10.9	31.7	39.4	33.2	42.5
sNES Public buildings (almost zero-energy building)	3.7	1.9	1.3	4.8	7.4
Energy audits	3.3	1.3	4.1	0.4	1.8
Environmentally friendly passenger cars	3.2	2.5	3.8	5.0	3.3
Replacement of lighting	0.0	1.6	4.9	8.9	4.7
Excess heat recovery	0.0	0.1	3.8	2.9	0.0
Energy optimisation	0.0	2.0	11.1	8.0	1.1
Tyres	0.0	0.0	7.9	7.8	8.6
Other measures	6.8	6.1	5.0	4.2	8.9

ECO FUNDS ANNUAL REPORTS

Energy Audits

Energy audits of larger business entities, especially those for which energy use in business processes is a non-negligible cost, are an important measure in achieving the energy efficiency targets. The aim of an energy audit is to identify possible measures to improve energy efficiency and consequently to reduce energy consumption. The implementation of energy audits in large companies is mandatory under the Act on Energy Efficiency. They are required to carry out an energy audit every four years and to 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 the energy consumption for buildings, processes, transport and human activities, in order to identify energy flows and opportunities for improving energy efficiency. The minimum requirement of an energy audit is a detailed review of the energy use of buildings, technological processes or industrial plants, transport and a set of possible measures to improve energy efficiency. The energy audit shall be based on actual, measured, verifiable and operational data on energy consumption for all energy sources.

Large companies are 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.

The Energy Agency has identified 318 large companies registered in Slovenia in the register of large companies for 2022, based on data from the Business Register of Slovenia.

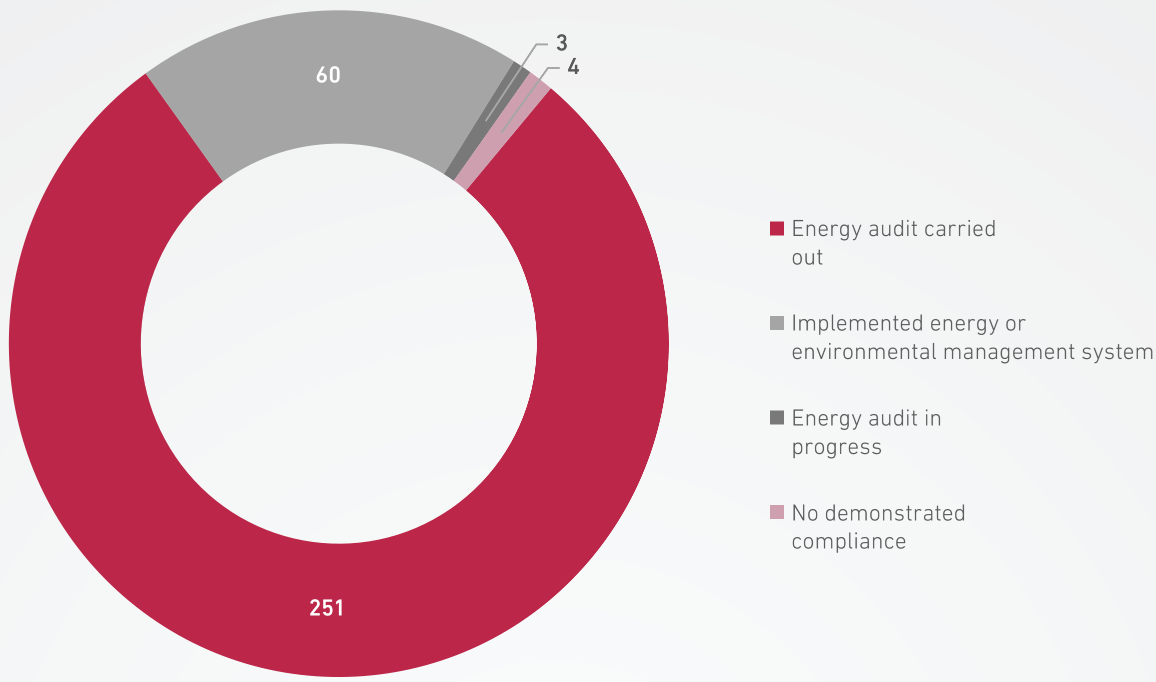
Large companies can comply with the obligation to carry out an energy audit:

- by carrying out an energy audit in accordance with SIST ISO 50002 or the SIST EN 16 247 series of standards (SIST EN 16 247-1, SIST EN 16 247-2, SIST EN 16 247-3 and SIST EN 16 247-4);
- with an energy management certificate in accordance with SIST EN ISO 50001 or an environmental management system in accordance with SIST EN ISO 14001, which shall also be subject to a minimum inspection in accordance with Annex A, point A.3 of SIST ISO 50002, to be carried out every four years.

At the end of 2022, 311 out of a total of 318 large companies had complied with the energy audit obligation, which is 98% of all the liable entities. Of these, 251 had carried out an energy audit, while 60 companies have a certified energy or environmental management system in place in accordance with European or international standards and have been recognised as having complied with the obligation by a decision confirming that they have complied with the energy audit obligation.

98% of all large companies comply with the energy audits obligation

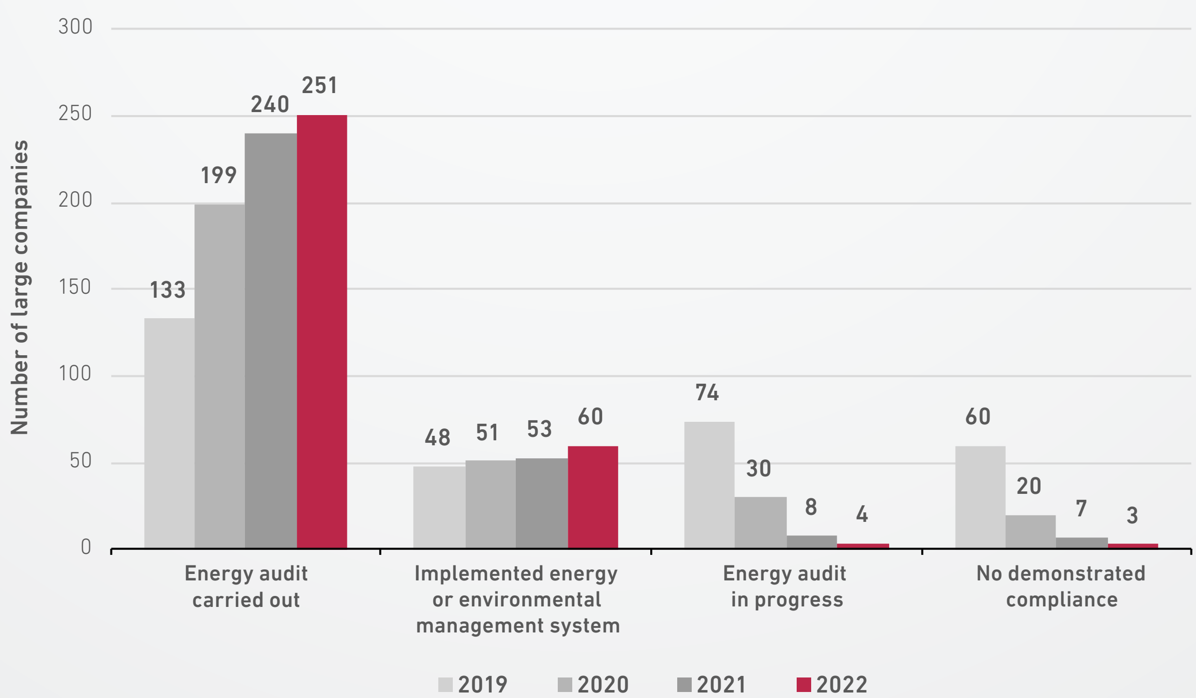
FIGURE 257: ENERGY AUDITS OF LARGE COMPANIES



SOURCE: ENERGY AGENCY

Although the burden of carrying out energy audits falls on the obliged companies, most large companies had complied with the obligation to carry out an energy audit by the end of 2022. Progress in the implementation of the measure is very encouraging, as can be seen in the figure below. While 181 large companies or 57% of all the obliged companies complied with the energy audit obligation in 2019, 311 large companies or 98% of the obliged companies complied with the obligation in 2022.

FIGURE 258: ENERGY AUDITS CARRIED OUT IN LARGE COMPANIES DURING THE YEARS 2019 AND 2022



SOURCE: ENERGY AGENCY

HEAT

11.4% LOWER HEAT CONSUMPTION

10.5% DECREASE IN PRIMARY FUEL CONSUMPTION

76% OF DISTRIBUTED HEAT PRODUCED IN COGENERATION

163.1% INCREASE IN FUEL OIL CONSUMPTION

13.4% LOWER COAL CONSUMPTION

17.3% DECREASE IN NATURAL GAS CONSUMPTION

23% OF HEAT PRODUCED FROM RES

59.6% OF DISTRIBUTION SYSTEMS ARE ENERGY EFFICIENT

24.7% HIGHER AVERAGE RETAIL PRICE OF HEAT

Energy in the form of hot water, steam or cold

HEAT

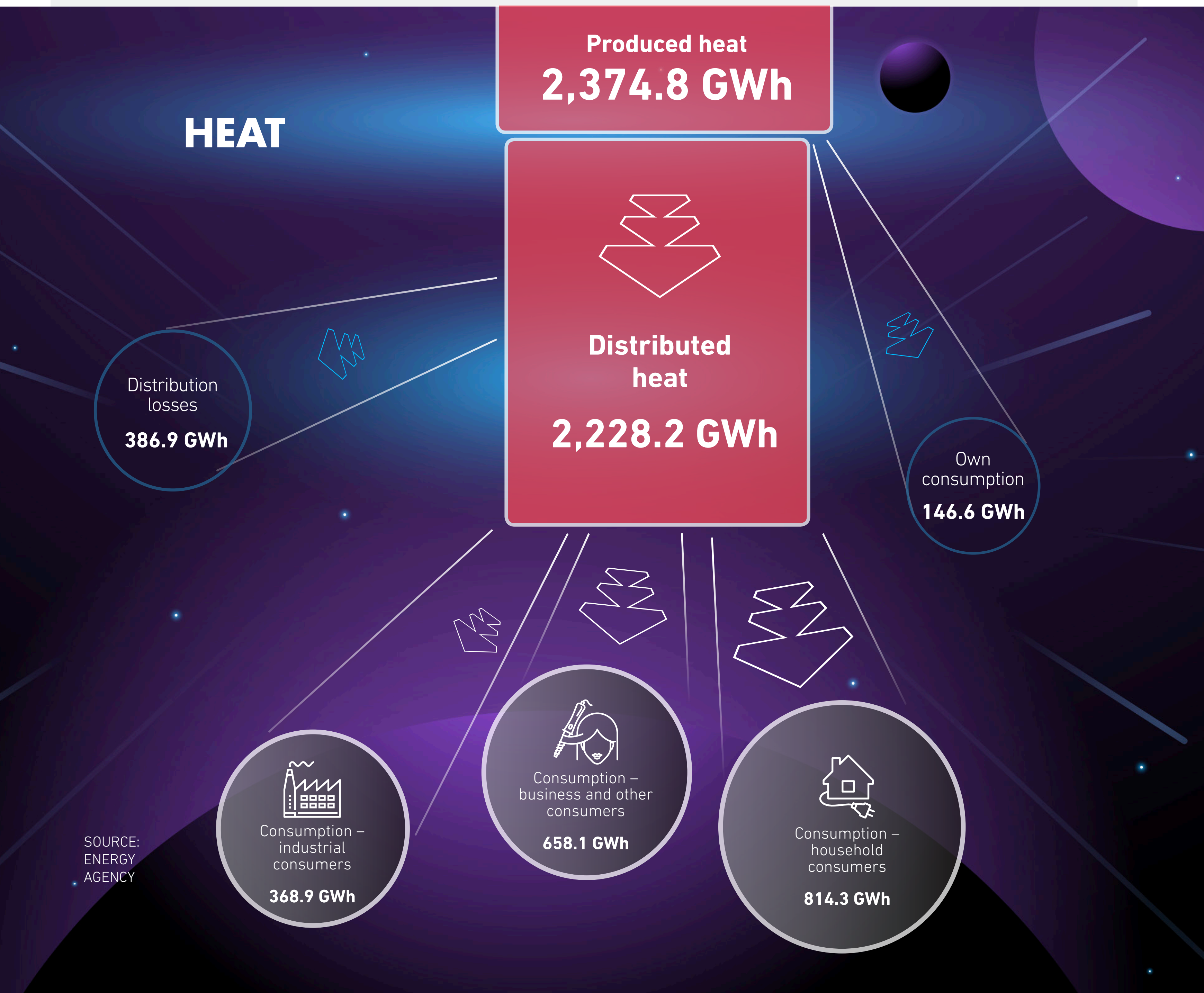
Supply of Heat

In 2022, 50 heat distributors provided heat from district heating. Distribution was carried out in 68 municipalities using 109 distribution systems.

Heat distributors supplied 2228.2 GWh of heat for the heating of buildings, domestic hot water and industrial steam processes, delivering 1841.3 GWh of heat to 108.794 consumers. The difference is distribution losses amounting to 386.9 GWh.

11.4% lower consumption of heat

FIGURE 259: BASIC DATA ON PRODUCED AND DISTRIBUTED HEAT FOR CONSUMERS OF HEAT CONNECTED TO THE DISTRIBUTION SYSTEMS



SOURCE: ENERGY AGENCY

Heat consumption for the supply of consumers on registered distribution systems was 11.4% lower than the year before[172] as well as in comparison to 2020, around 0.6%. The significantly lower consumption is mainly due to the significant increase in final heat prices, which were in turn due to the higher prices of energy inputs for heat production, and partly also due to higher annual temperatures during this period.

76% of distributed heat was produced in cogeneration units

The number of heat consumers was 0.9% lower than the previous year.

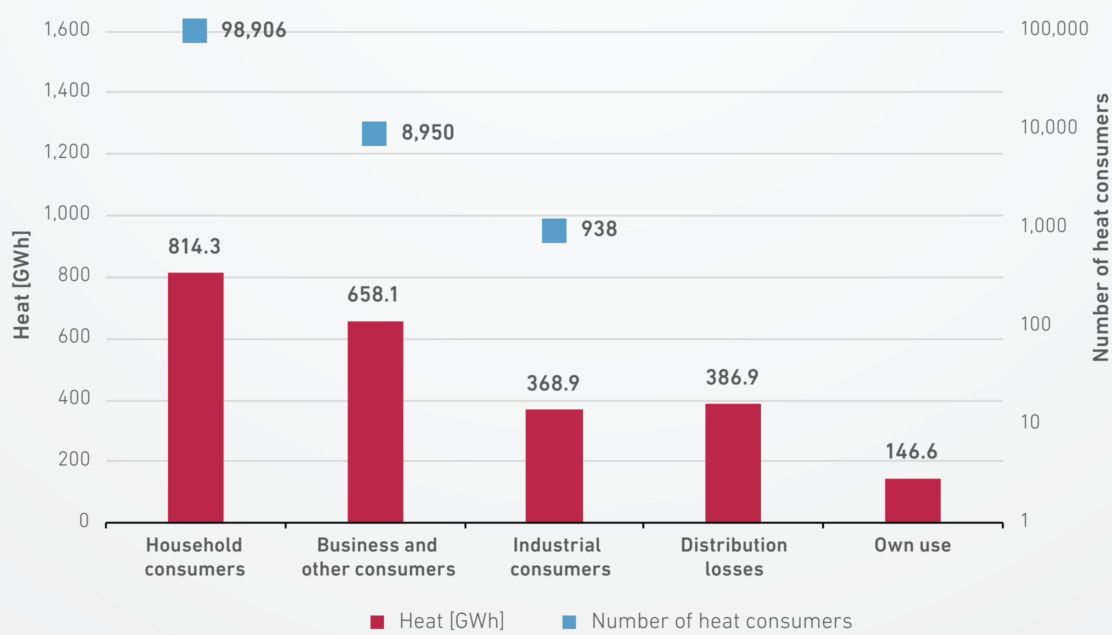
In 2022, two larger district cooling distribution systems with a total installed capacity of 3.88 MW of refrigeration units were in operation, primarily supplying business consumers in Velenje and industrial consumers in Kranj.

Heat distributors with their own production and heat producers supplying distribution systems have produced 2374.8 GWh of useful heat for heating, the preparation of sanitary hot water, the supply of industrial processes, and their own needs. At the same time, 778.5 GWh of electricity or 681.5 GWh of electricity were produced at the threshold of the cogeneration processes. The heat produced in cogeneration accounted for 73.9% of all the useful heat produced (for own use and for the distribution systems). The remaining 26.1% of the heat was produced in other technological processes (woody biomass boilers, natural gas, liquefied petroleum gas, heat recovery processes from geothermal wells, waste heat from industrial processes, incineration plants, etc.). In the share of heat for supplying distribution systems, heat from cogeneration sources covered 76%.

The largest share of the total useful heat produced, 34%, was used to supply 98,906 domestic customers, while 27.7% of the heat was consumed by 8,950 commercial customers and 15.5% of the heat was used by 938 industrial customers. Heat producers or distributors used 6.5% of the heat for their own needs (own use for industrial processes, heating and domestic hot water), while the remaining 16.3% is accounted for by the total annual distribution losses[173].

The consumption of useful produced heat in production processes supplying distribution systems, by type of consumers and their number is shown in Figure 260.

FIGURE 260: HEAT CONSUMPTION BY THE TYPE OF CONSUMER AND THEIR NUMBER



SOURCE: ENERGY AGENCY

172 Due to the subsequent revisions to the data for the 2021 calendar year received from reporting agents, the year-on-year comparisons may differ slightly from last year's published data for 2021.
173 The total distribution losses also include the distribution losses of the internal distribution systems of the heat producers.

In 2022, 13.8 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 is down by around 10.5% compared to the previous year.

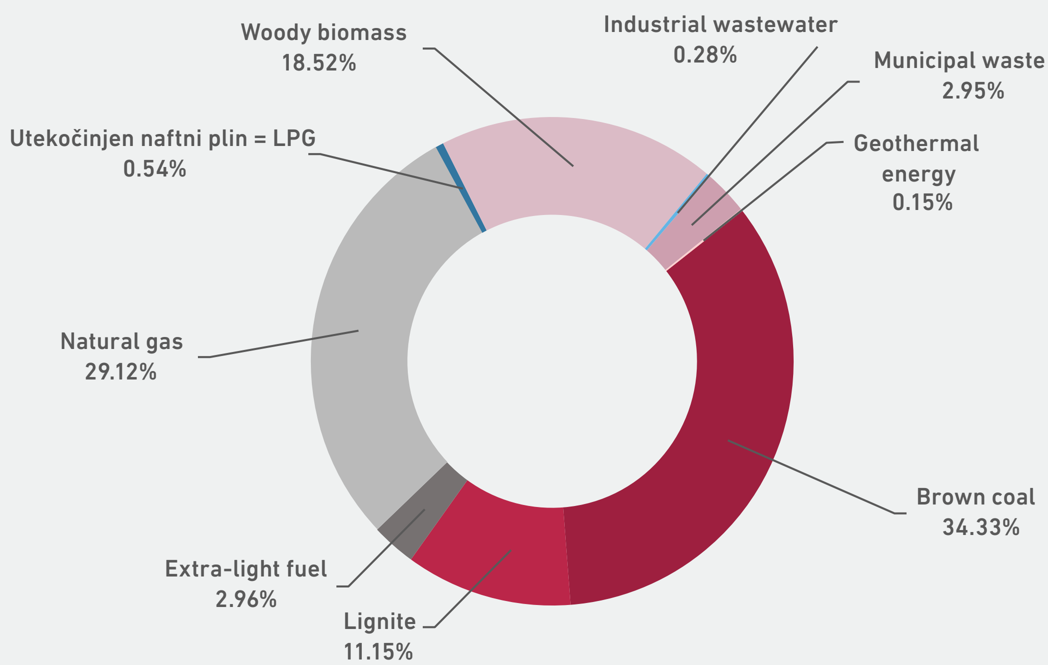
A 10.5% decrease in primary fuel consumption

Coal remains the main primary energy for heat generation to supply distribution systems, with a share of 45.49%, followed by natural gas with 29.11%, and other primary energy sources with 25.4%. The share of natural gas decreased by around 17.27% compared to 2021 due to price spikes in the wholesale market

Oil and petroleum products accounted for 3.5% of the primary energy mix, renewable sources (wood biomass, geothermal energy and biodegradable waste) for 21.62%, and industrial waste heat for 0.28%. Biodegradable waste heat was only produced in the municipal waste incineration plant of the Municipality of Celje, while industrial process heat was produced in the area of the Ravne Ironworks (SIJ Metal Ravne) and in the Lek Ljubljana plant. With primary energy becoming more and more expensive, the use of excess heat from production processes for the supply of heat distribution systems is becoming an increasingly important factor in the affordable supply of heat to consumers.

The structure of the primary energy products for heat production is presented in Figure 261.

FIGURE 261: STRUCTURE OF THE PRIMARY ENERGY PRODUCTS FOR HEAT GENERATION



SOURCE: ENERGY AGENCY

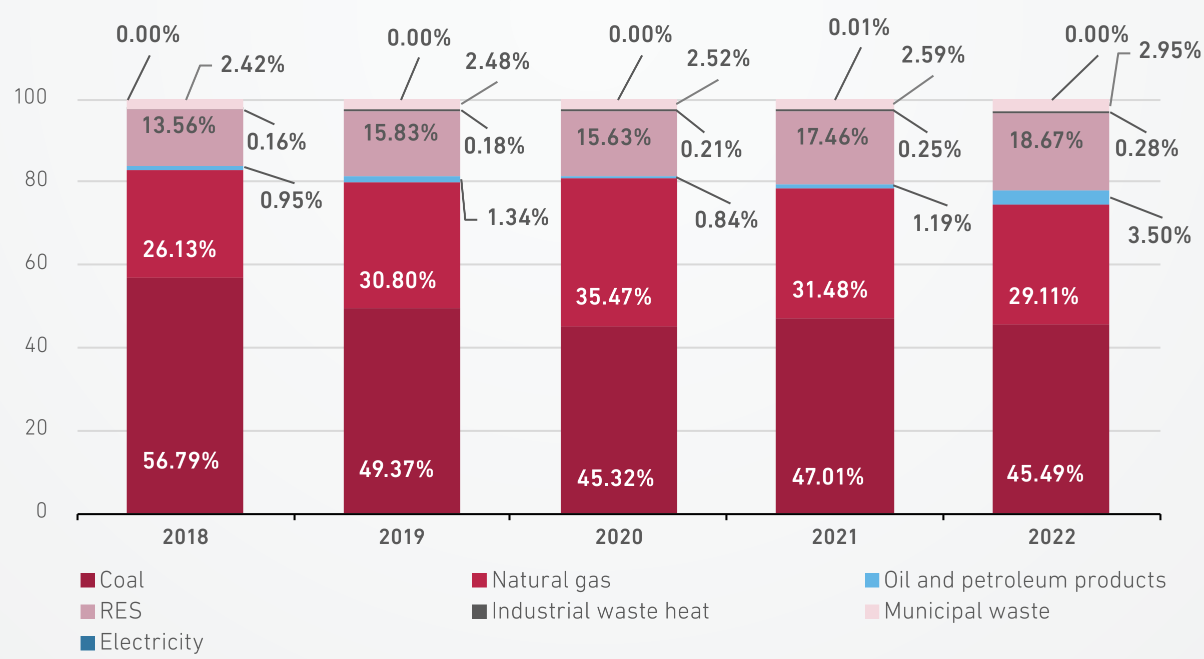
Compared to the previous year, in the structure of the primary energy sources, the shares of extra-light fuel, coal and natural gas changed the most (Figure 262). The lower coal consumption is mainly the result of the problems of the Šoštanj Thermal Power Plant and the Velenje Lignite Mine, as the share of lignite as a primary fuel decreased by 28.24%, while the share of brown coal in TE-TOL Ljubljana also decreased by 7.22%.

A 163.1% increase in extra-light fuel consumption
A 13.4% decrease in coal consumption
A 17.3% decrease in natural gas consumption

The significant impact on the decrease in the consumption of natural gas in the energy mix in 2022 is mainly due to the high and volatile prices of natural gas in the wholesale market, which were consequently reflected in a significant increase in the consumption of petroleum products in production processes where petroleum products can be used instead of natural gas. Indeed, as an alternative fuel to natural gas in certain production processes, petroleum products have been more affordable and consequently more acceptable than natural gas.

In 2022, in addition to the rising natural gas and petroleum prices, the high prices for CO_2 emission allowances on the exchange markets have also contributed significantly to the increase in heat prices for district heating systems. Their average monthly offer price was, according to data from the European Energy Exchange, EUR 79.5/tonne CO_2, which is a 46.6% increase compared to the previous year. The average monthly offer prices in 2022 ranged between EUR 68.4/tCO_2 and EUR 89.5/tCO_2, while the daily offer price exceeded EUR 97.3/tCO_2 in the first quarter of 2022.

FIGURE 262: STRUCTURE OF THE PRIMARY ENERGY PRODUCTS IN THE 2018–2022 PERIOD

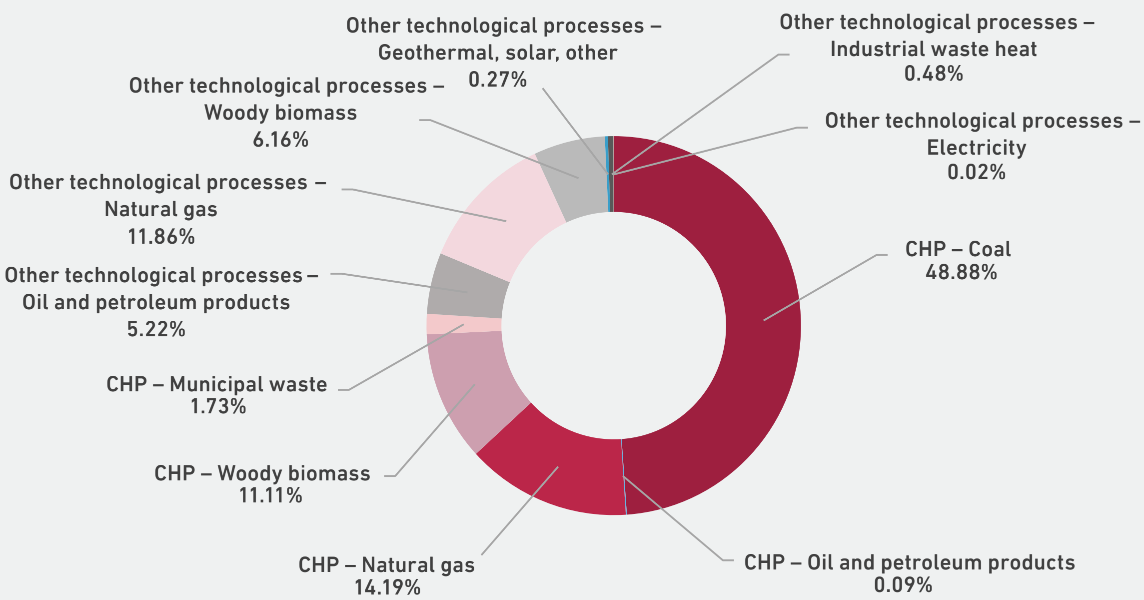


SOURCE: ENERGY AGENCY

Coal as a primary source was only used in cogeneration processes, with 1089.5 GWh of heat and 377.5% of gross electricity. Natural gas was used to a greater extent in the remaining cogeneration and other technological processes (400.9% of gross electricity and 1285.3 GWh of heat). 117.6 GWh of gross electricity and 545.4 GWh were produced from RES. The structural share of primary energy consumed in relation to the method of heat generation for the supply of distribution systems is shown in Figure 263.

23% of heat was produced from RES

FIGURE 263: STRUCTURE OF PRIMARY ENERGY SOURCES[174] FOR HEAT PRODUCTION FOR DISTRIBUTION SYSTEMS



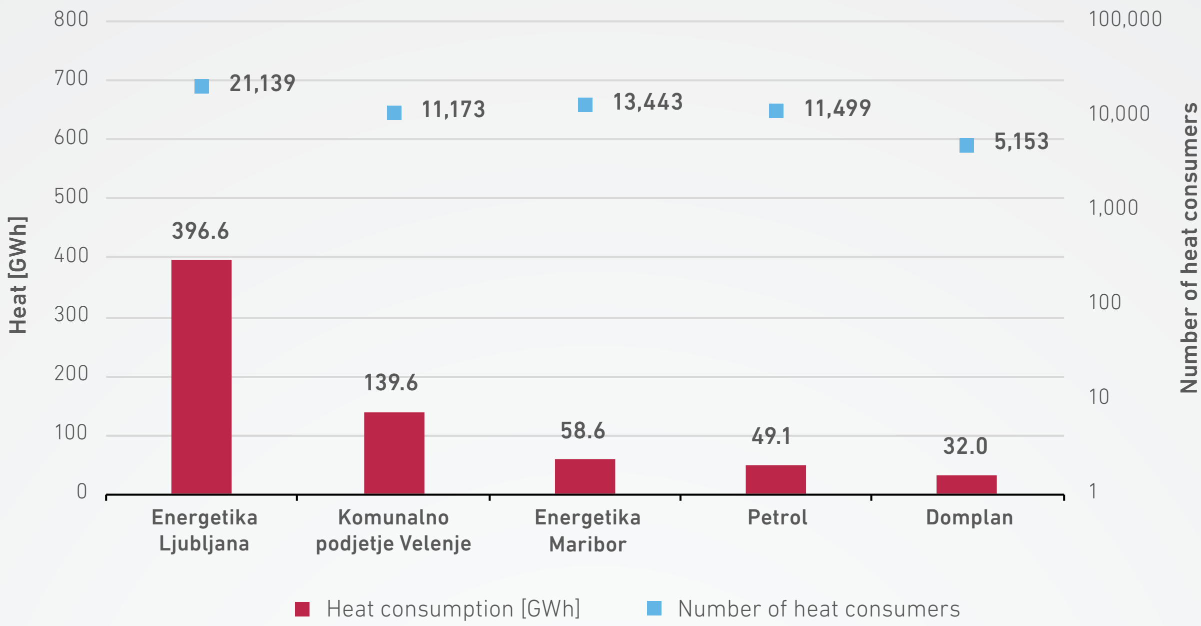
SOURCE: ENERGY AGENCY

In 2022, the first five largest heat distributors in terms of volumes of heat delivered to final consumers supplied as much as 86.1% of all the delivered heat from 47 distribution systems. In doing so, 66.6% of all district heating consumers were supplied.

The five largest distributors to household consumers supplied 63.1% of these consumers and delivered 83% of heat to them from 37 distribution systems. Heat for space heating and domestic hot water was distributed from 109 distribution systems. In this context, 83 distribution systems in 57 Slovenian municipalities supplied household consumers. This is shown in Figure 264.

174 Due to rounding values (shares) to two decimal places, there may be discrepancies in the total value of the shares.

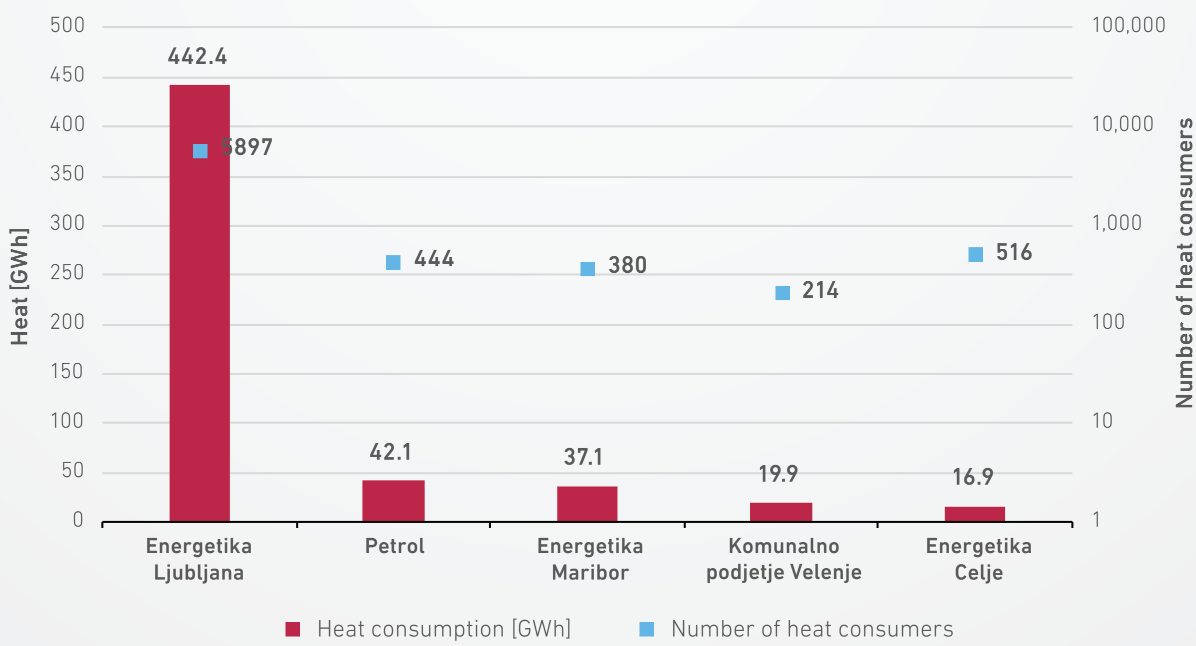
FIGURE 264: HEAT CONSUMPTION AND THE NUMBER OF HOUSEHOLD CONSUMERS OF THE FIVE LARGEST HEAT DISTRIBUTORS



SOURCE: ENERGY AGENCY

The five largest heat distributors supplying heat for space heating and domestic hot water from 25 distribution systems to business and other heat consumers, supplied 83.2% of these consumers and delivered 84.5% of all heat to them (Figure 265). In 2022, business and other heat consumers were supplied from 78 distribution systems in 59 Slovenian municipalities.

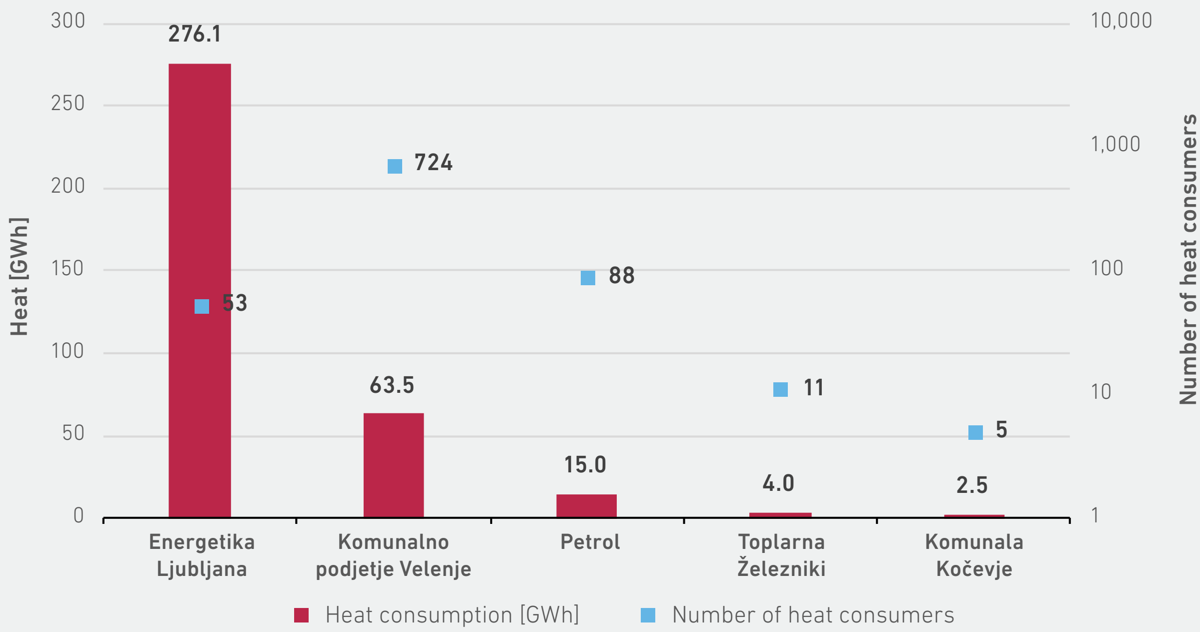
FIGURE 265: HEAT CONSUMPTION AND THE NUMBER OF BUSINESS AND OTHER CONSUMERS AT THE LARGEST HEAT DISTRIBUTORS



SOURCE: ENERGY AGENCY

The five largest heat distributors supplying heat for industrial processes and heating to industrial consumers supplied 93.7% of these consumers from 13 distribution systems and delivered 97.8% of the heat for industrial customers (Figure 266). In 2022, industrial consumers were supplied using 24 distribution systems in 21 Slovenian municipalities.

FIGURE 266: HEAT CONSUMPTION AND THE NUMBER OF INDUSTRIAL CONSUMERS OF THE FIVE LARGEST DISTRIBUTORS



SOURCE: ENERGY AGENCY

Heat Distribution Systems

According to the Energy Agency's records[175], heat supply in 2022 was carried out from 109 distribution systems (60 as a service of general economic interest, 17 commercial, and 32 private) in 68 Slovenian municipalities. The total length of the distribution systems was 924.1 km. As an optional local service of general economic interest, heat supply was carried out by 60 distribution systems operated by 35 distributors in 51 Slovenian municipalities. In 12 municipalities, the supply was carried out as a market activity, and in 17 municipalities, the heat supply was carried out by private distribution systems. Private distribution systems in the municipalities of Kranj, Koper, Maribor and Žalec are large distribution systems for the supply of household and business consumers. In 2022 in these municipalities, 7 private distribution systems supplied as many as 10,052 consumers, including 9,931 households.

The distribution systems where the activity of distributing heat is carried out as an optional local service provided heat to 87.9% of the heat consumers, and their share of the delivered heat was 93.9% of all the heat delivered from these systems.

Large district cooling systems are only located in the municipalities of Velenje and Kranj, with a total of 1.5 kilometres.

Municipalities with distribution systems and quantities of distributed heat in 2022 are shown in Figure 267

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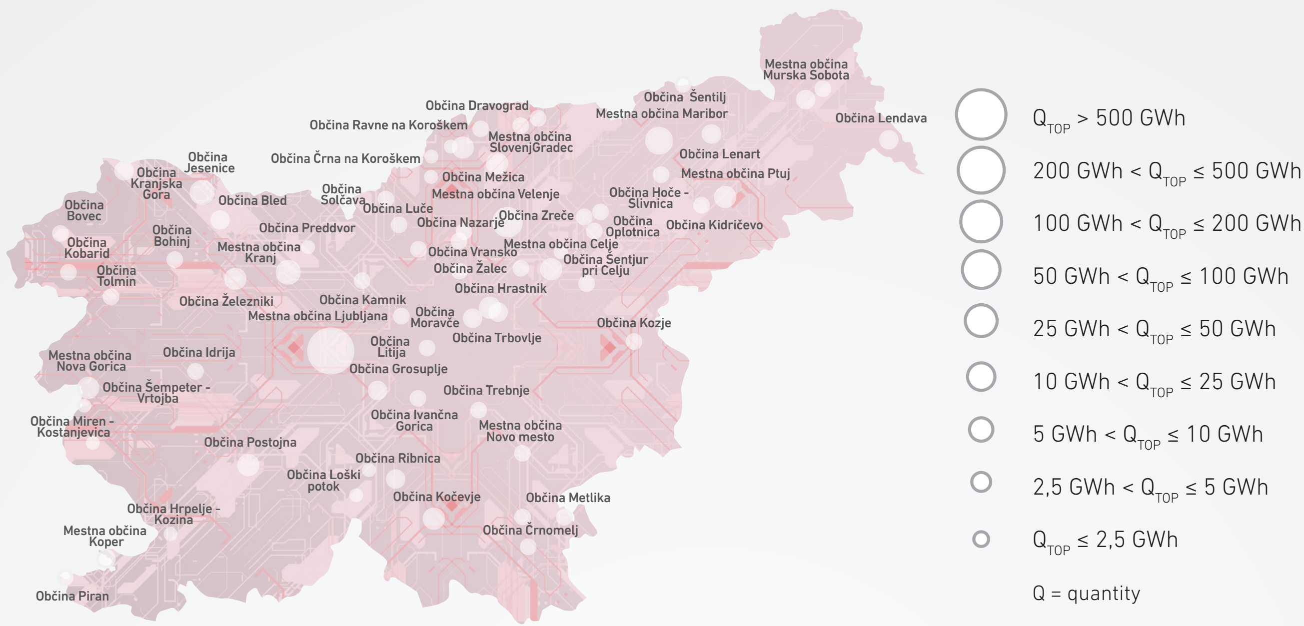
175 Distribution systems do not include the internal distribution systems of the heat producers.

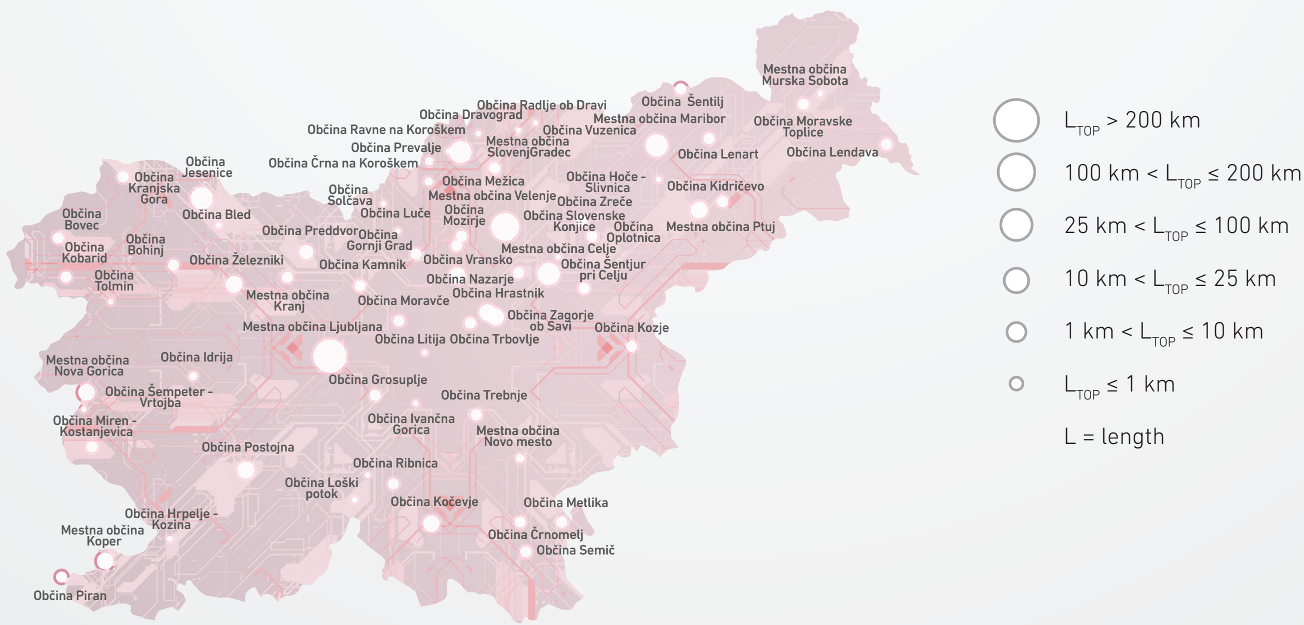
FIGURE 267: QUANTITIES OF DISTRIBUTED HEAT BY SLOVENIAN MUNICIPALITIES



SOURCE: ENERGY AGENCY

With respect to the temperature regime of the operations of the individual systems, the systems are divided into warm-water systems, hot-water systems, steam distribution systems and district cooling systems. The length of the warm-water and hot-water distribution systems accounts for 98.8% of the entire length of the distribution systems, steam distribution systems 1%, and district cooling systems slightly less than 0.2% of the total length of the distribution systems. The longest distribution systems are still in Ljubljana (a 275.8-km-long warm-water distribution system) and Velenje with Šoštanj (a 180.2-km-long warm-water distribution system). The average length of the heat distribution systems was 8.1 kilometres and the distribution systems recorded average annual heat distribution losses of 16.3% of the total heat distributed.

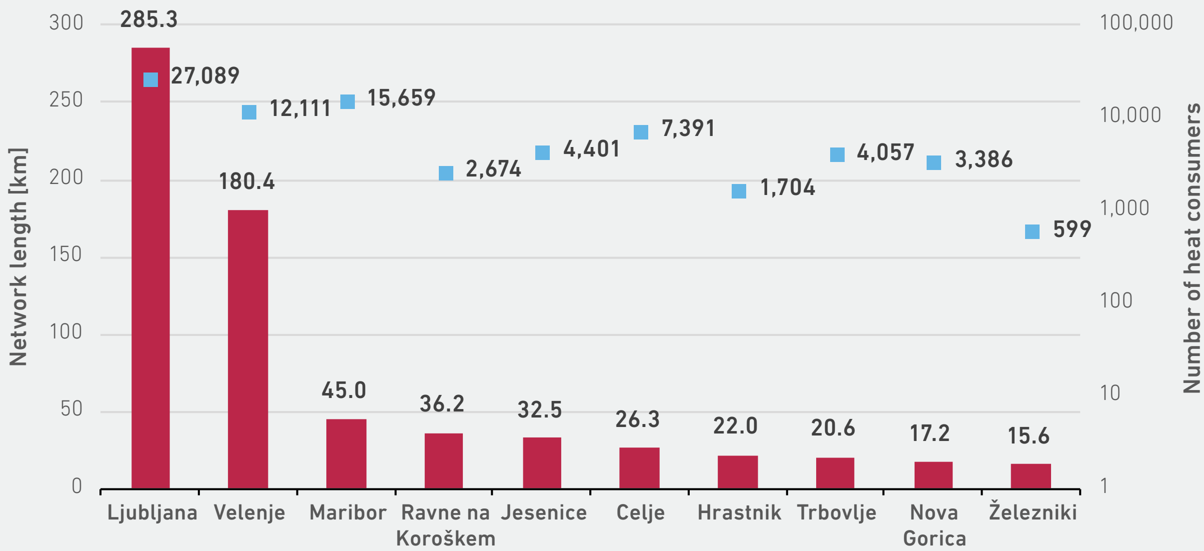
FIGURE 268: LENGTH OF THE HEAT DISTRIBUTION SYSTEMS IN THE SLOVENIAN MUNICIPALITIES



SOURCE: ENERGY AGENCY

The length of the ten largest heat distribution systems and the number of heat consumers in 2022 are shown in Figure 269.

FIGURE 269: 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.

Every year, the Energy Agency monitors which heat distribution systems meet the criteria and publishes a list of energy-efficient heat distribution systems on its website seznam energetsko učinkovitih distribucijskih sistemov toplote.

According to these criteria, in 2022, out of 109 registered heat distribution systems where heat distribution is carried out as a service of general economic interest or market activity or from a private distribution system, 65 were energy-efficient (i.e. they met at least one of the criteria, some of them more). The largest number of distribution systems, 54, met the energy efficiency criterion of at least 50% of the distributed heat being produced directly or indirectly from RES. Ten distribution systems met the energy efficiency criterion of at least 75% of the distributed heat being produced from cogeneration. However, no distribution system met the criterion that at least 50% of the distributed heat is produced from waste heat.

59.6%
energy-efficient distribution systems

A heat distribution system can also be energy-efficient if the amount of heat distributed is produced from at least 50% of a combination of heat from at least two of the above sources. This criterion was met by 12 distribution systems.

The Price of Heat

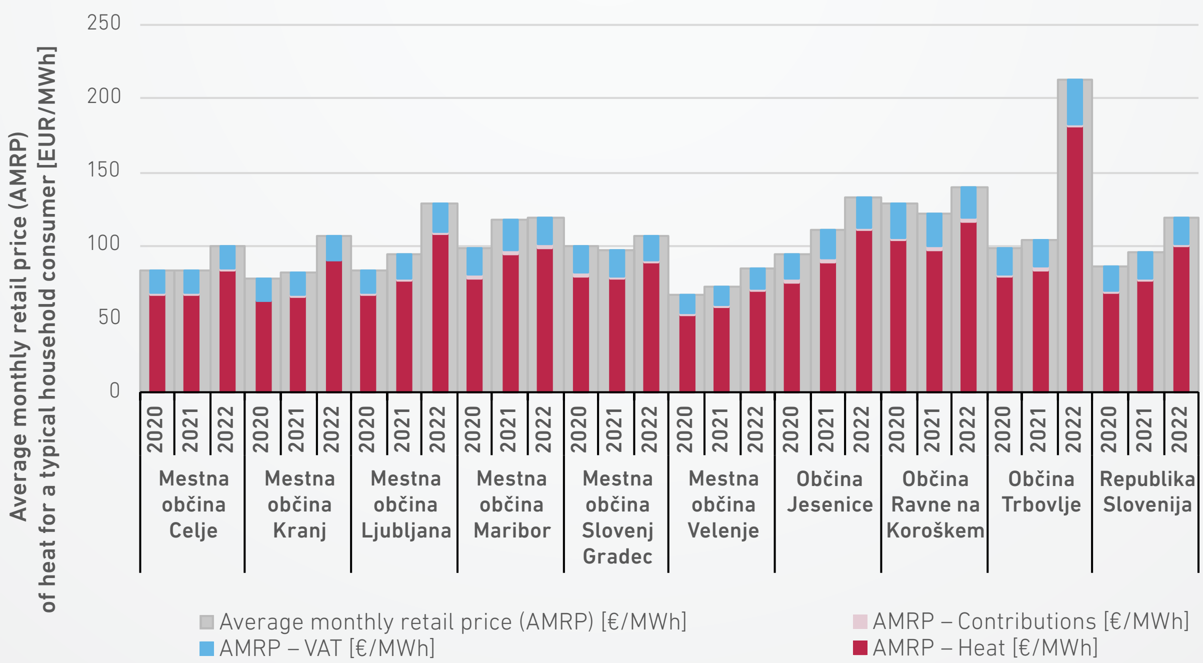
A 24.7% higher average retail price

The average retail price of heat in nine selected Slovenian municipalities with heat distribution systems is calculated as the average monthly retail price of heat for residential heating and sanitary hot water on the basis of publicly announced price lists of heat distributors for 2022 for a typical household heat consumer in a multi-dwelling residential building with an annual capacity of 7 kW and an average annual consumption of 6.21 MWh.

In 2022, distribution systems in the selected Slovenian municipalities supplied 70.2% of all household consumers supplied in Slovenia, while their acquired heat was 86.4% of all the heat delivered to these consumers.

The average retail prices for heat in the selected municipalities are shown in Figure 270. They are calculated as the weighted average monthly retail prices for a typical household heat consumer living in a multi-dwelling residential building in each selected municipality, and the average monthly retail price of heat for the entire territory of Slovenia is also shown, weighted by the number of household consumers supplied. The average monthly retail price of heat for household consumers increased on average by 24.7% in all of the mentioned municipalities in comparison with the previous year, and was EUR 119.45/MWh in 2022. The largest jump in heat prices occurred at the beginning of the 2022/2023 heating season due to the ever-increasing prices of primary energy sources, especially natural gas. The heat prices increased the most for household consumers in Trbovlje – EUR 213,26/MWh (EUR 104.2%), where the average retail price was the highest among the selected municipalities.

FIGURE 270: CHANGES IN THE AVERAGE RETAIL PRICE OF HEAT FOR HOUSEHOLD CONSUMERS IN INDIVIDUAL SLOVENIAN CITIES IN THE 2020–2022 PERIOD



SOURCE: ENERGY AGENCY

Regulating the Price of Heat for District Heating

The Energy Agency regulates the price of heat for district heating on the basis of the current Act on Heat Supply Pricing Methodology. Persons subject to regulation are heat distributors performing an optional service of general economic interest using distribution systems to which more than 500 household customers 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-time heat price for a particular distribution system or heat supply and to any change in the heat price. However, these entities must only notify the regulatory authority about the adjustment of the individual elements of the starting heat price 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 abovementioned Act.

The Energy Agency was dealing with requests for consent to the starting price of heat from the obliged parties, which were received in order to meet the criteria for a new request under the Act on Heat Supply Pricing Methodology. These criteria relate to major technological changes, changes in the tariff system, changes in the planned quantities of distributed heat of more than 20% or changes in consumers' planned accounting power of more than 10%, a substantial change or suspension of an undertaking's activities and a lower actual cost-plus price than the last applicable average price.

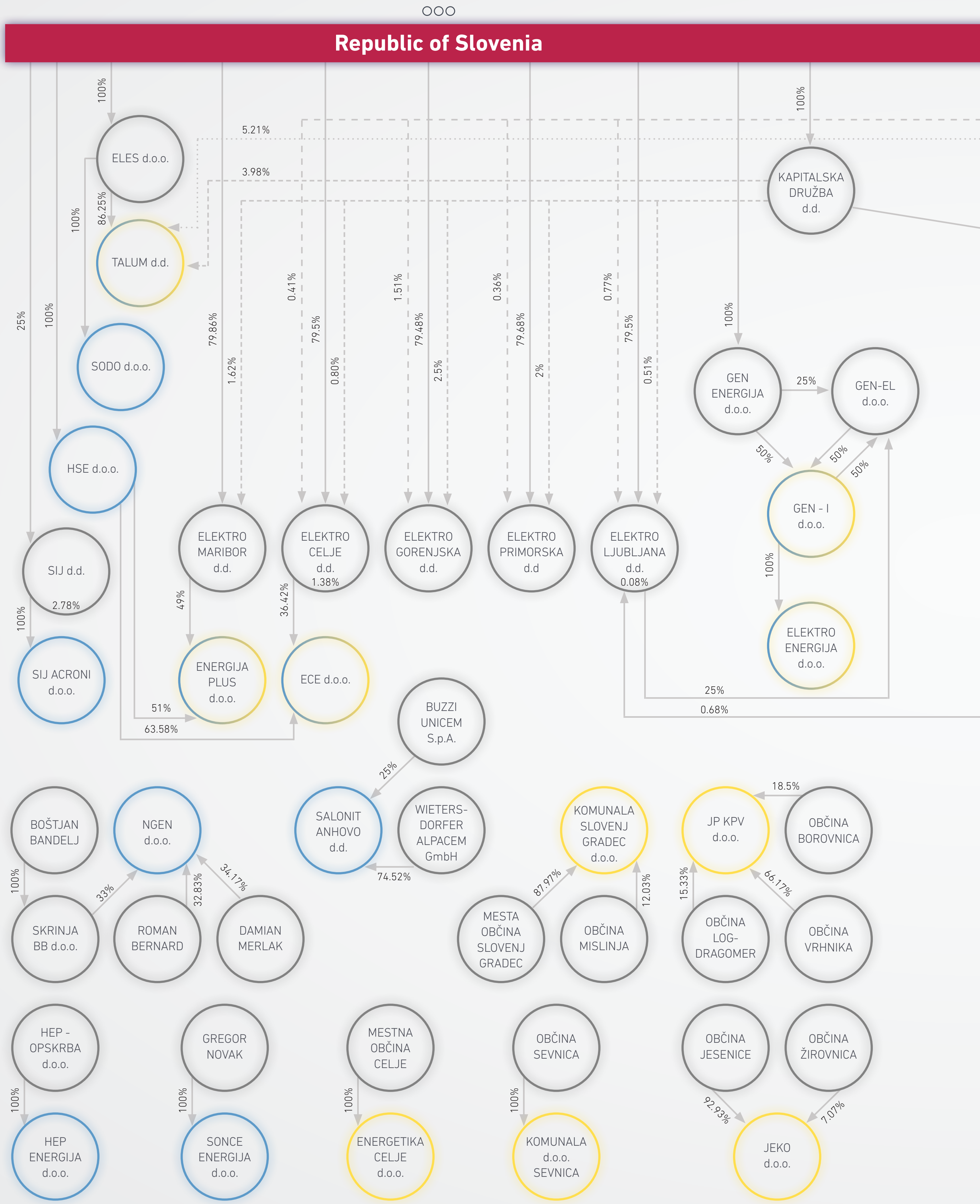
It also monitored and analysed the adjustments of the starting heat prices due to changes in eligible costs, and it also supervised the method of accounting for heat and the publication of heat tariff items. In 2022, the Energy Agency received 132 notifications on the adjustment of the variable part of the starting heat price and 12 notifications on the adjustment of the fixed part of the starting heat price. The starting prices of heat were mainly adjusted due to the sudden increase in the prices of energy products for the production of heat and emission coupons.

Unbundling

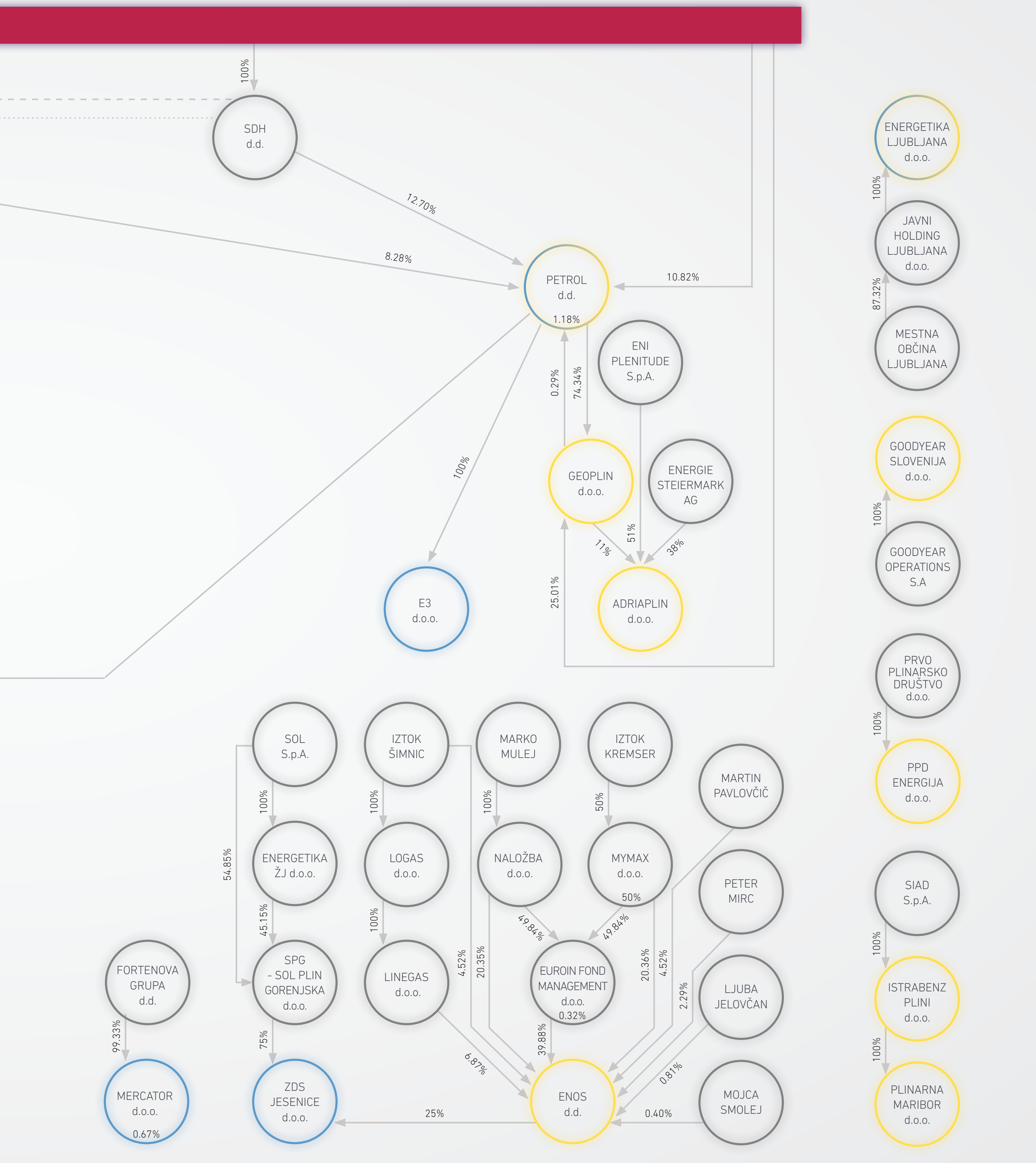
Distributors performing services of general economic interest and carrying out activities other than heat distribution should keep separate accounts in accordance with accounting standards and disclose separate accounts in the notes on the financial statements for heat distribution, heat production and other activities.

To this end, they should define in their internal acts the criteria for allocating assets and liabilities, costs and 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 judgments should be audited annually by an auditor, who must produce a special report.

FIGURE 271: OWNERSHIP STRUCTURE OF ELECTRICITY AND NATURAL GAS SUPPLIERS – ON 31 DECEMBER 2022

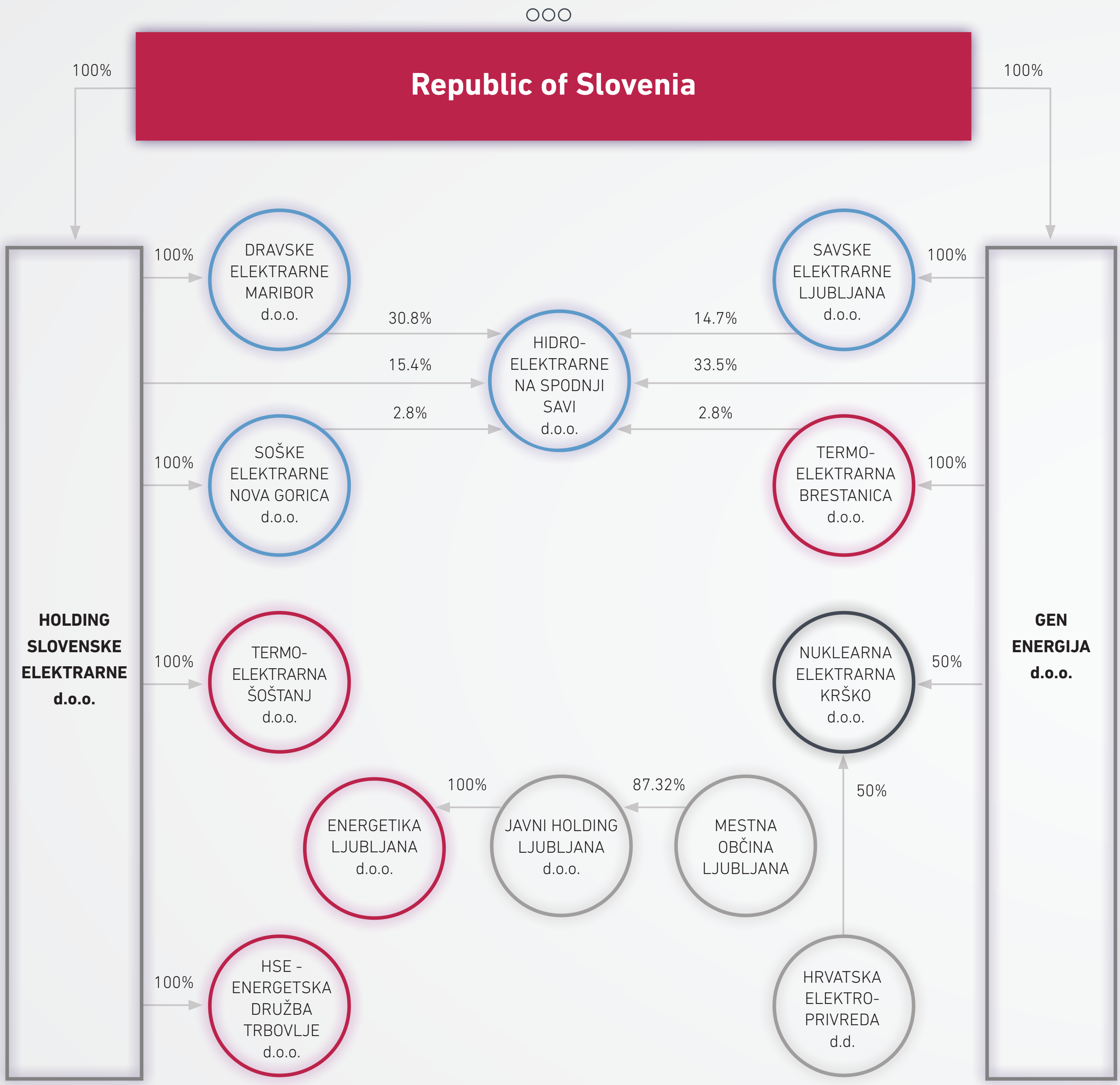


■ Electricity supplier ■ Natural gas supplier ■ Electricity and natural gas supplier



SOURCE: GVIN.COM

FIGURE 272: OWNERSHIP STRUCTURE OF ELECTRICITY PRODUCERS WITH INSTALLED CAPACITY MORE THAN 10 MW – ON 31 DECEMBER 2022



SOURCE: GVIN.COM

LIST OF ABBREVIATIONS AND ACRONYMS

ACER	Agency for the Cooperation of Energy Regulators
Agencija za energijo	Energy Agency
AIB	Association of Issuing Bodies
AJPES	Agency of the Republic of Slovenia for Public Legal Records and Related Services
AM	Amortization
AMS	Advanced Metering System
AN-OVE	National Renewable Energy Action Plan 2010–2020
AN-URE 2020	National Energy Efficiency Action Plan 2017–2020
APT	Advanced Persistent Threat
AREDOP	Active Regulation of Energy Activities and Networks of the Future
Borzen	Borzen, Power Market Operator
B2B	Business to Business
B2C	Business to Consumer
B2G	Business to Government
BEV	Battery Electric Vehicle
BRS	Business Requirement Specifications
BS	Balance Group
BSP	BSP, Regional Energy Exchange, Southpool
CBCA	Cross-Border Cost Allocation
CDS	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
CHP	Combined Heat and Power
CIM	Common Information Model (IEC 61970-3XX)
C_{neg} in C_{poz}	Basic Imbalance Prices
CNG	Compressed Natural Gas
CONE	Cost of New Entry
CRIDA	Complementary Regional Intraday Auctions proposal
CROPEX	Croatian Power Exchange
CSD/CSW	Social Work Centre
CSDMP	Central system for access to metering data

CZP	Cross-zonal capacity
DA	Day Ahead
DEM	Dravske elektrarne HPP
DG ENER	Directorate-General for Energy of the European Commission
DSO	Distribution System Operator
DTO	Distribution-Transformer Station
E	Electricity
EAFO	European Alternative Fuels Observatory
ebIX	European Forum for Energy Business Information eXchange
ECCo SP	Communication & connectivity service platform
EDC	Electricity distribution company
EENS	Expected energy non-served
EEX	European Energy Exchange AG, Leipzig
EFET	European Federation of Energy Traders
EC	European Commission
ENISA	The European Union Agency for Cybersecurity
ENTSO-E	European Network of Transmission System Operators for Electricity
EPOS-G2	E-reporting of energy service providers' data
ESMIG	European Smart Energy Solution Providers
EU	European Union
EUCC	European Candidate Cybersecurity Certification scheme
EV	Electric Vehicle
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
EZ-1	Energy Act
EXAA	Energy Exchange Austria
GDP	Gross Domestic Product
GIAC	Global Information Assurance Certification
GIE AGSI	Gas Infrastructure Europe – Aggregated Gas Storage Inventory
GIZ	Economic Interest Grouping
GIZ DZP	Economic Interest Grouping for Natural Gas Distribution
GJS	Service of general economic interest
GME	Gestore Mercati Energetici, Italian market exchange
GO	Guarantee of Origin
GO	Household consumer (Gospodinjski odjemalec)
GO_TČ	Household consumer with heat pump
GS1	Global Business Languages (http://www.gs1.org)
HEP	Hrvatska elektroprivreda d.d.
HESS	Hidroelektrarne na Spodnji Savi, d.o.o.
HHI	Herfindahl-Hirschman index
HOPS	Hrvatski operator prijenosnog sustava d.o.o.
HPP	Hydroelectric Power Plant
HSE	Holding Slovenske elektrarne, d.o.o.
HSE EDT Trbovlje	HSE – Energetska družba Trbovlje, d.o.o.

HUPX	Hungarian Power Exchange
HT	High Tariff
HV	High Voltage
I	Incentives
IEA	International Energy Agency
IEGSA	Interoperable pan-European Grid Service Architecture
IKT	Information and communication technology
IoT	Internet of Things
IPET	Energy Market Data Exchange (IPET Section)
JAO	Joint Allocation Office
JPEL	Javno podjetje Energetika Ljubljana
KPI	Key Performance Indicator
LNG	Liquefied Natural Gas
LT	Low Tariff
LV	Low Voltage
LOLE	Loss of Load Expectation
MAIFI	Momentary Average Interruption Frequency Index
MID	Measuring Instruments Regulation
MRS	Metering-regulation Station
MV	Medium Voltage
NEMO	Nominated Electricity Market Operator
RP	Retail Price
RPI	Retail Price Index
MZI	Ministry for Infrastructure
NBIoT	Narrow Band Internet of Things
NEK / NNP	Nuklearna elektrarna Krško, d.o.o. /Nuclear Power Plant
NEPN	National Renewable Energy Action Plan
NG	Natural Gas
NOKI	National Cyber Incident Response Plan
OT	Operational Technology
P	Power
PCI	Projects of Common Interest
PHEV	Plug-in Hybrid Electric Vehicles
PT	Peak tariff
R&I	Research and Innovations
RCE	Reference costs of electricity
RDS	Regulated Return on Assets
REMIT	Regulation (EU) No 1227/2011 of the European Parliament and of the Council on wholesale energy market integrity and transparency
RES	Renewable Energy Sources
RF	Regulatory Framework
RP	Retail Price
RPI	Retail price Index
RR	Replacement Reserve
RRM	Registered Reporting Mechanism

SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SANS	SysAdmin, Audit, Network, and Security (Escal Institute of Advanced Technologies)
SCT	Single Contact Point
SDV (OMC)	Operating and maintenance costs
SEDMP	System for Uniform Access to Measurement Data
SEEI	Costs of electrical power system losses
SEL	Savske elektrarne Ljubljana d.o.o.
SENG	Soške elektrarne Nova Gorica d.o.o.
SEP	Single Entry Point
SEVF	Slovenian Energy Security Forum
SGTF-EG1	Smart Grid Task Force Expert Group 1
SHB	Slovenia, Croatia, Bosnia and Herzegovina (block SHB)
SIDC	Single IntraDay Coupling
SKM /PPS	PPS – Power Purchase Standard
SIPX	Slovenian Price Index
SODO	Distribution system operator
SONDSEE	System operating instructions for the electricity distribution system
SS	System Services
STAT	Statistical Office of the Republic of Slovenia
T	Annual operating hours
TEB	Termoelektrarna Brestanica d.o.o.
TEŠ	Termoelektrarna Šoštanj d.o.o.
TPP	Thermoelectric Power Plant
URSIV	Information Security Administration
SU	System User
VOLL	Value of Lost Load
TSO	Transmission System Operator
VAT	Value-Added Tax
VOLL	Value of Lost Load
ZGD-1	Companies Act, Official Gazette of the RS, Nos. 65/09 – official consolidated text, 33/11, 91/11, 32/12, 57/12, 44/13 – dec. CC, 82/13, 55/15, 15/17 and 22/19 – ZPosS
ZNPOVCE	Act Regulating Emergency Intervention to Adress High Energy Prices
ZNUDDVE	Act on an emergency measure in the field of value added tax to mitigate the increase in energy prices
ZOEE	Electricity Supply Act
ZOP	Gas Supply Act
ZPGVCEP	Act Governing Aid to Businesses Hit by High Increases in Electricity and Natural Gas Prices
ZPKEEKP	Act on the Guarantee of the Republic of Slovenia for the Obligations from Credits Taken Out to Ensure Liquidity on the Organized Electricity Markets and Emission Coupons and Obligations from the Purchase Additional Quantities of Natural Gas from Outside the European Union Market
ZUOKPOE	Act on Measures for the Management of Crisis Conditions in the Field of Energy Supply
ZUOPVCE	Act Determining Emergency Measures to Mitigate the Consequences of the Impact of High Energy Com modity Prices
ZURE	Act on Energy Efficiency

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