



ANNUAL REPORT ON THE ELECTRICITY AND NATURAL GAS MARKETS IN 2023

PORTUGAL

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1 FOREWORD

The Portuguese Energy Services Regulatory Authority (ERSE) regulates the natural gas and electricity sectors in Portugal, as well as liquefied petroleum gas (LPG) in all categories, petroleum-derived fuels, the biofuels sector and electric mobility.

The present report complies with the provisions of Directives 2019/944¹ 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; and Directive 2019/692² of the European Parliament and of the Council of 17 April 2019 amending Directive 2009/73/EC concerning common rules for the internal market in natural gas. These Directives dictate that regulators must annually inform national authorities, the European Commission and the Agency for the Cooperation of Energy Regulators (ACER) on their activities and on any developments observed in the electricity and natural gas markets.

This report is sent to the member of the Government responsible for energy, to the Portuguese Parliament, to the European Commission and to ACER; ERSE publishes the report on its website.

The report follows the structure proposed at European level and presents the main developments in the electricity and natural gas markets in Portugal in 2023, including issues such as competition in the wholesale and retail markets, security of supply and consumer protection. The report also covers the regulatory measures adopted and the results obtained with regard to ERSE's annual activities.

The report reflects, whenever applicable, mainland Portugal as well as the archipelagos of the Azores and Madeira. For the natural gas sector, the report only describes the market in mainland Portugal. There is no natural gas in the Azores and in Madeira gas is used solely for the production of electricity.

¹ Transposed into national law by Decree Law no. 101-D/2020 of 7 December (establishes the requirements applicable to buildings to increase their energy performance and regulates the system for energy certification of buildings) and by Decree Law no. 15/2022, of 14 January.

² Transposed into national law by Decree Law no. 62/2020, of 28 August.

2 MAIN DEVELOPMENTS IN THE ELECTRICITY AND NATURAL GAS SECTORS

2.1 EVALUATION OF DEVELOPMENTS AND MARKET REGULATION

Generation and energy demand

After a 2022 still marked by the effects of the energy crisis that started being felt at the end of 2021, 2023 had a 0.7% increase in electricity consumption compared to the previous year. In the case of natural gas, a 21% decrease in annual consumption was felt, compared to 2022, very much due to the lower usage of combined cycle gas turbine power plants. Comparing with the previous year, natural gas consumption to produce electricity reduced 42%, while consumption by high pressure clients recovered around 3%. Consumption on interconnected distribution networks fell 6%.

In electricity production, the hydrological year was neutral (annual hydroelectric productivity index of 0.99), which was reflected in hydroelectric generation. The wind power productivity index was the same as in the previous year (0.99), and the installed power also remained stable. Satisfaction of consumption by renewable generation varied from 63% in 2022 to 75% in 2023, due to the more favourable hydrological conditions.

In 2023, there was a less significant contribution from combined cycle gas turbine power plants, due to the verified hydrological conditions. Also, the electricity import balance grew from 9.26 TWh in 2022 to 10.23 TWh in 2023.

Installed capacity in generation increased compared to 2022, notably solar photovoltaic power, with an additional 700 MW (an increase of 37%, not considering self-consumption).

In 2023, the Terceira Island (Azores) battery plant came into operation (15 MW) and in Madeira construction began on two new batteries plants, the third and fourth. With these two new batteries, which enter into operation in 2024, the Madeira region will reach 68 MVA of installed capacity in battery plants. The objective of these batteries is to increase the renewable energy reception capacity and to optimise the operation cost of thermal units.

Renewable Energy Sources

The total installed capacity in renewable generation increased by 5% in 2023, mainly as a result of new photovoltaic solar power capacity. The recent reserve power capacity auctions for grid connection, focused on photovoltaic technology, point to the continuation of this trend in the coming years.

Additionally, and in the context of the most recent national legislative framework for the electricity sector, approved in January 2022, renewable energy producers are showing great interest in hybrid technology projects, both on sites with already installed renewable production and in new projects.

The production of electricity from renewable sources increased 25% compared to the previous year. Hydropower plants contributed 23% of consumption³. Wind generation accounted for 25% of consumption, while the remaining renewables maintained a share equivalent to that of the previous year.

Wholesale electricity and natural gas markets

At wholesale market level, although the electricity sector did not register the entry of any a new big power plant, there was an increase in total photovoltaic capacity. There was thus an increase in installed generation capacity, pointing to greater competition and decarbonisation of the electricity sector.

The degree of integration of the Iberian market remained very high, with prices being practically coupled, even taking into account the various circumstances associated with a decrease in the hydrological index or the increase in commodity prices with an impact on the formation of wholesale electricity prices.

In terms of natural gas, the volume of organised market transactions reached 170 GWh, tripling the 2022 volume (57 GWh). Nevertheless, it is a very incipient liquidity level, representing less than 0.4% of the demand in the Gas National Transmission Grid (RNTG) (0.1% in 2022) and 1.6% of total transactions⁴ in the *Virtual Trading Point* – VTP (0.6% in 2022). Although the balancing actions performed by the Global Technical Manager (GTG) through acquisitions or sales in the organised market increased by 30%, their weight in the overall transactions in the organised market was only 36% (82% in the previous year).

In this context, market agents still prefer bilateral exchanges to perform their trades in the wholesale market, which is detrimental to a daily and consistent VTP price formation.

³ Pumping included.

⁴ Transaction on the organised market and through bilateral contracts.

During 2023, the concept of dominant operator in the natural gas was regulated which paved the way to the implementation, in the beginning of 2024, of the obligation for dominant operators to perform the market-making service in the organised market, which implies the presentation of a certain volume of bid and ask offers separated by a maximum price difference. It is foreseen that this measure will contribute positively to organised market liquidity and to creating a more solid short term price reference.

Electricity and natural gas retail markets

In the retail markets, there continued to be a wide variety of commercial offers, including gas and electricity offers. The pace of switching, in number of clients, was 17% for electricity and 19% for natural gas. In the natural gas market, this pace represented a 4 p.p. decrease compared to 2022.

In 2023, 93% of electricity consumption and 85% of customers were supplied by a market supplier. In the natural gas sector, market suppliers delivered gas to 95% of consumption and 72% of customers. The decrease in the weight of the number of gas customers in the liberalised market, compared to 2022 (76%), was mainly due to the possibility for smaller customers (consumption up to 10 000 m³/year) to return to regulated tariffs, which was approved by Decree Law No. 57-B/2022, of 6 September.

In the electricity market, by the end of 2023 there were 34 liberalised market suppliers, 32 of which supplying household customers and small companies (with contracted power equal or below 41.4 kVA). Compared to 2022, 1 supplier joined the market. In the natural gas market, there were 20 free market suppliers, 18 of which supplying customers with overall consumption equal or below 500 m³/year.⁵

Since 2018, household electricity customers have the right to ask market suppliers to charge them the regulated tariff and, if the supplier does not offer that option, customers can join the regulated supplier of last resort. This possibility allowed for the return of around 30 000 customers to the supplier of last resort, corresponding to nearly 5.4% of the consumption that switched supplier in 2023.

The return to the natural gas regulated market, for customers with consumption below 10.000 m³, became possible with the publication of Decree Law 57-B/2022, on 6 September. With this measure, around 84 000 customers returned to the suppliers of last resort in the natural gas sector during 2023. This represented 6% of the consumption that switched supplier in 2023.

⁵ The number of suppliers shown refers to suppliers with customers in their portfolio.

As regards customers benefiting from the social tariff, 13.1% of electricity customers and 4.3% of natural gas consumers in Mainland Portugal were under this regime, which gives customers a discount on their final bill, regardless of their supplier.

Electricity and natural gas prices

The evolution of wholesale electricity and natural gas prices registered high volatility and uncertainty, with prices decreasing significantly in 2023 compared to 2022 (-47% in electricity prices and around -61% in natural gas prices).

In the electricity sector, in 2023, regulated network access tariffs experienced a significant reduction of -288.7%, compared to 2022, due to the reduction of General Economic Interest Costs (CIEG). This tariff component represented a benefit for the National Electricity System (SEN), higher than the value in 2022.

Regarding tariff decisions, there was an exceptional tariff setting decision, which resulted in two different prices being applied: one price from January to June, and another price from July to December. Additionally, the energy component for regulated market customers was updated (+ 5 EUR/MWh), as a result of the Tariffs Code (RT) mechanism that corrects forecast deviations from the real energy cost.

In natural gas, regulated network access tariffs varied between 2.9% and 4.1%, depending on the pressure levels and the type of consumer. It should be noted that, also in the gas sector, there was an update on the energy price applicable to the retail SOLR's customers (+2 EUR/MWh), with effect from 1 January 2023.

Electricity smart grids

At the end of 2023, more than 5.5 million customers in mainland Portugal (i.e. 86%) had a smart meter installed and around 4.8 million (i.e. 74%) were integrated into a smart grid. The pace of installation and integration into the smart grid is in line with the objectives approved by the Government in the respective schedule and with the legal objective of completing the process by the end of 2024.

In the Autonomous Region of Madeira, a rollout of smart meters and the provision of smart grid services are also underway. The network operator (EEM) estimates its completion by the end of 2025.

Other relevant market developments

At the regulatory level, the Manual of Procedures for the Global Management of the Electricity Sector System (MPGGS) was revised, adopting the standardised product of frequency restoration reserves with manual activation (mFRR), in accordance with the methodology approved by ACER.

A new methodology for balancing non-interconnected gas distribution networks (supplied by UAG) was approved, by amending the Manual of Procedures for the Global Technical Management of the SNG and the Manual for the Logistical Management of UAG Supply. This new methodology provides for the figure of the Virtual UAG in order to simplify the commercial process of exchanging gas on these networks and clearing stocks for market agents. It also explains the reception of renewable gases, either by direct injection into the non-interconnected networks or by the delivery of liquefied biomethane to the UAGs.

In terms of natural gas, rules were laid down for determining the entities to be included on the list of dominant operators, and a government order was published which established the conditions applicable to the SNG's dominant operators in the performance of the market-making service. Also in gas, the rules for trading on the organised market were updated.

The experience of implementing the activity of the Authority for the Emission of Guarantees of Origin (EEGO), together with the need to integrate it with the electricity labelling rules published by ERSE and with the systems of the Association of Issuing Bodies (AIB), and the legal, regulatory and normative changes that occurred after it was drawn up, justified the revision and publication of a new EEGO Manual of Procedures, through Directive no. 17/2023, of 31 August.

As part of the operation and use of networks and interconnections, an amendment to the common methodology for calculating interconnection capacity in the South West Europe region was approved, which includes Portugal, Spain and France, in order to fulfil the obligation to supply 70% of interconnection capacity to the market, as established in Regulation (EC) 2019/943 of 5 June.

2.2 REVISION OF ELECTRICITY SECTOR REGULATIONS TO IMPLEMENT THE LEGAL REGIME APPROVED IN 2022

In 2023, ERSE held an in-depth public consultation (Public Consultation No. 113) on electricity sector codes, following the publication of the respective legal framework, approved by Decree Law No. 15/2022 of 14 January. This law establishes the organisation and operation of the SEN, transposing Directive (EU)

2019/944 of the European Parliament and of the Council of 5 June 2019 and Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018, introducing significant changes to the SEN's legal framework. This public consultation also included matters that are transversal to the gas sector, included in the Commercial Relations Code and the Quality of Service Code, as well as the approval of a new Code on the Misappropriation of Energy.

3 ELECTRICITY MARKET

3.1 NETWORK REGULATION

3.1.1 TECHNICAL FUNCTIONING

3.1.1.1 BALANCING

The mobilisation of the service to compensate for deviations in electricity production and consumption, as well as the resolution of technical restrictions, is carried out within the scope of the ancillary services markets, the implementation of which is the responsibility of REN - Rede Eléctrica Nacional S.A., in its role as Global Technical System Manager, under the terms of the ROR⁶ and the MPGGS⁷.

The energy mobilised to resolve technical restrictions and the secondary regulation band ("frequency restoration reserve") contracted entail costs that are distributed among consumption. In addition, the costs and revenues of mobilising secondary regulation energy and regulation reserve ("replacement reserve") in each imbalance settlement period, which are used to cancel agents' imbalances in real time, are shared by all the market agents who imbalanced in that period, in proportion to their imbalance.

Figure 3-1 shows the impact of the daily, intraday⁸ and ancillary services markets on the costs allocated to suppliers in 2023, including the breakdown of the share in the daily and intraday markets and the ancillary services market.

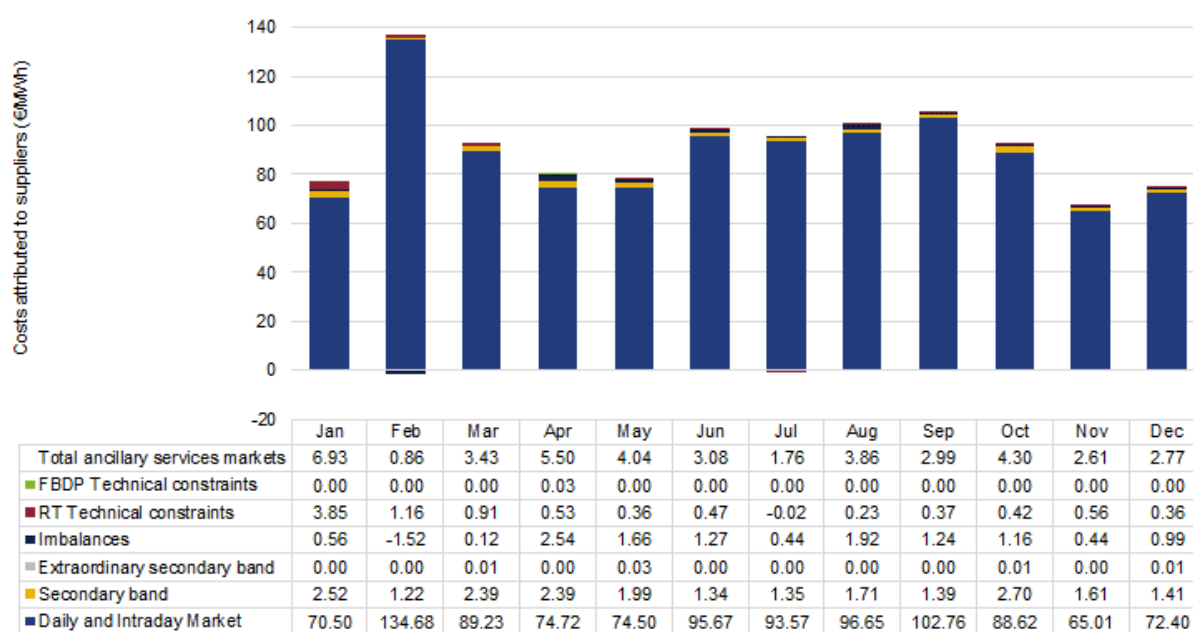
Figure 3-1 also shows that the price of the ancillary services market was essentially influenced by the costs associated with the contracting of secondary band, the resolution of imbalances and technical constraints in real time, with the other components having a less significant expression.

⁶ [Electricity Networks Operation Code](#), approved by Regulation no. 816/2023 of 27 July, following Public Consultation no. 113.

⁷ [MPGGS](#), approved by Directive no. 19/2023 of 26 December

⁸ Excludes the integrated and continuous intraday market, resulting from the implementation of the model provided for in Commission Regulation (EU) 2015/1222 of 24 July 2015 (XBID).

Figure 3-1 – Impact of daily, intraday and ancillary services markets on the costs allocated to suppliers operating in Portugal in 2023

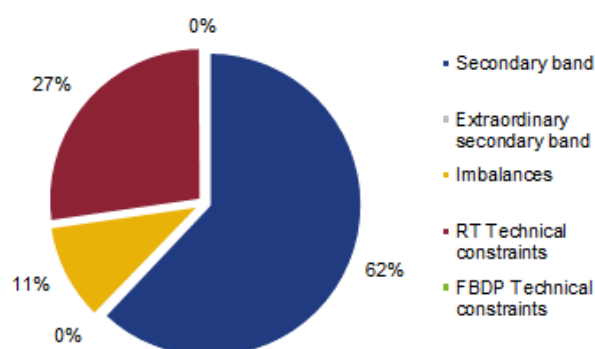


Source: REN data. Note: FBDDP – Daily Base Operating Schedule and RT - Real Time.

In 2023, the ancillary services markets represented a weighted average cost of 2.97 EUR/MWh, compared to a weighted average price in the daily and intraday markets of 87.91 EUR/MWh, which translates into a significant reduction in the average daily and intraday market price of around 48% compared to the previous year, with the average cost of the ancillary services markets remaining practically the same.

Figure 3-2 shows the breakdown of the ancillary services market costs, confirming that the weight of secondary band contract is dominant, practically double that of the resolution of imbalances and technical constraints.

Figure 3-2 – Breakdown of costs of the ancillary services market, 2023



Source: REN data

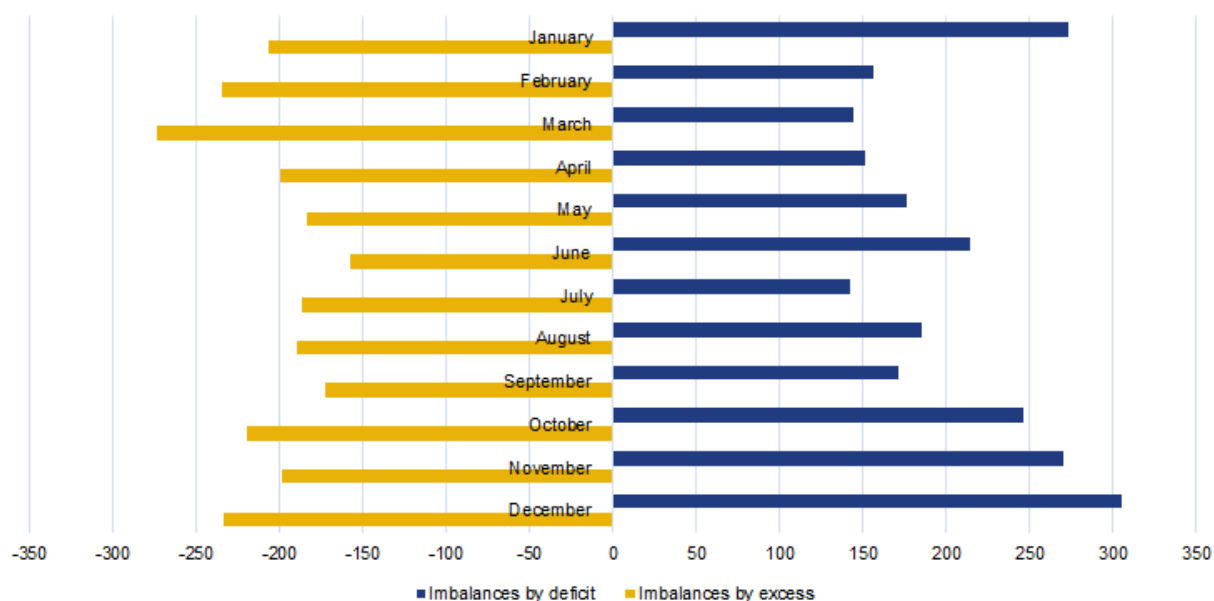
The value of the imbalances in each hour corresponds exactly to the variable regulation costs, payable to the agents that resolve the imbalance by participating in the ancillary services market (system service providers - BSP).

Figure 3-3 shows the evolution of imbalance energy, by excess⁹ and by deficit¹⁰, observed during 2023. Compared to 2022, there was an increase in deficit deviations, with a variation in the monthly average from 170 GWh to 203 GWh, offset by a reduction in excess deviations, with a variation in the monthly average from 226 GWh to 205 GWh. In total terms, there was a slight increase from 4.756 TWh in 2022 to 4.892 TWh.

⁹ Each hourly surplus (excess) imbalance is the result of consumption lower than previously scheduled (consumers' imbalance), or the result of generation higher than previously scheduled (generation units' imbalance).

¹⁰ Each hourly deficit imbalance is the result of consumption higher than previously scheduled (consumers' imbalance), or the result of generation lower than previously scheduled (generation units' imbalance).

Figure 3-3 – Evolution of imbalances (MWh), 2023



Source: REN data

MECHANISM TO ENCOURAGE THE REDUCTION OF LOSSES IN DISTRIBUTION NETWORKS

In addition to deviations, losses also contribute to the system's imbalance, and their reduction is a constant concern.

The incentive mechanism for reducing losses in distribution networks in mainland Portugal is established in the electricity sector Tariffs Code, approved by Regulation no. 828/2023, published in the Diário da República, 2nd series, of 28 July.

For the 2022-2025 regulatory period, this incentive mechanism is made up of three components, one of which is directly linked to the results of the annual energy balance (component 1), while the other two are linked to the results achieved with the actions to mitigate illicit consumption carried out by the operator of the National Electricity Distribution Network (RND) (components 2 and 3).

The incentive to reduce losses in the distribution network (PP) is calculated as follows:

$$PP = PP_1 + PP_2 + PP_3$$

COMPONENT 1

Component 1 of the incentive mechanism for reducing losses in distribution networks is based on the annual energy balance with the percentage values of losses referring to the energy measured at the input and corresponds to a symmetrical mechanism with the value indexed to the unit value of energy on the market and which includes a neutral band zone, as illustrated in Figure 3-4.

For the purposes of component 1 of the incentive and for the entire 2022-2025 regulatory period, a daily market energy price of 50 EUR/MWh was assumed.

Figure 3-4 – Component 1 of the incentive mechanism for the 2022-2025 regulatory period

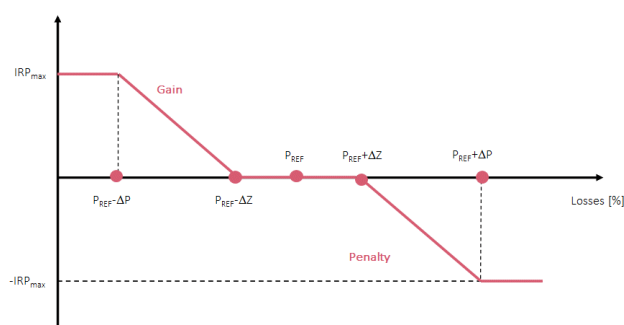


Table 3-1 summarises the parameters of component 1 of the incentive to reduce losses in 2022.

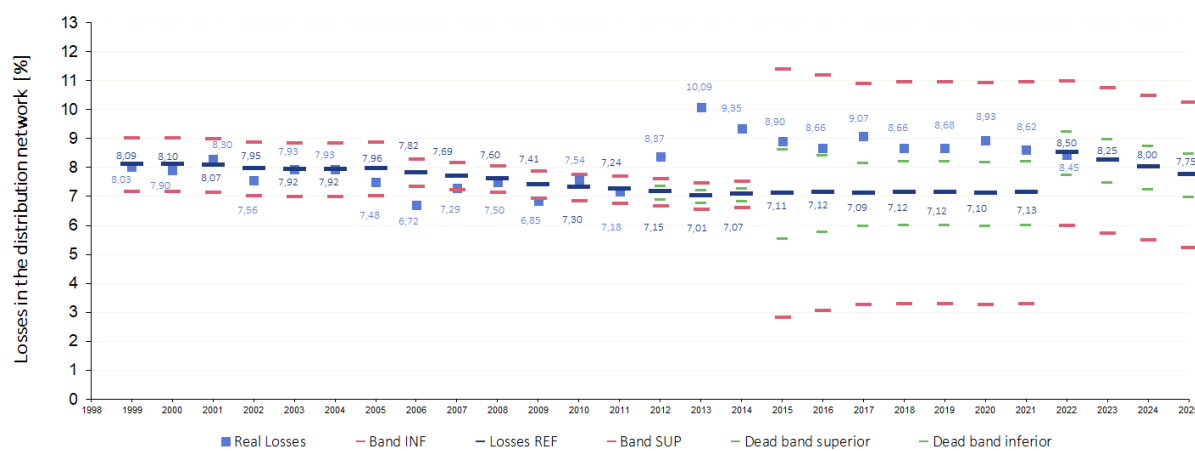
Table 3-1 – Component 1 parameters in 2022

Value of reference losses P_{REF} (%)	Value of ΔZ (%)	Value of ΔP (%)	Valuation of losses V_{P1} (€/MWh)	Maximum premium or penalty $IRP_{max} = -IRP_{min}$ (€)
8.50	0.75	2.5	25.0	20 000 000

Implementation in 2022 of component 1

In 2022, the value of losses in distribution networks in relation to the energy input was 8.45 %, as shown in Figure 3-5, which shows the evolution of losses in the distribution networks between 1999 and 2022, in the input reference.

Figure 3-5 – Evolution of verified losses in distribution networks in the input reference



Since 8.45 % of the losses are verified, this is below the reference losses (8.50 %), but since it is within the neutral band (limit 7.75 %), there is no premium for its performance.

In these terms, component 1 of the incentive is nil:

$$PP_1 = 0$$

COMPONENT 2

Component 2 of the incentive mechanism for reducing losses in distribution networks corresponds to a direct sharing with the RND operator of the results obtained in actions to combat illicit consumption. The amount recovered from these actions (MR) is shared according to the value of a sharing percentage (k), defined for the regulatory period.

Component 2 (PP₂) is calculated as follows:

$$PP_2 = k \times MR$$

The sharing percentage (k) defined for the 2022-2025 regulatory period is k = 25 %.

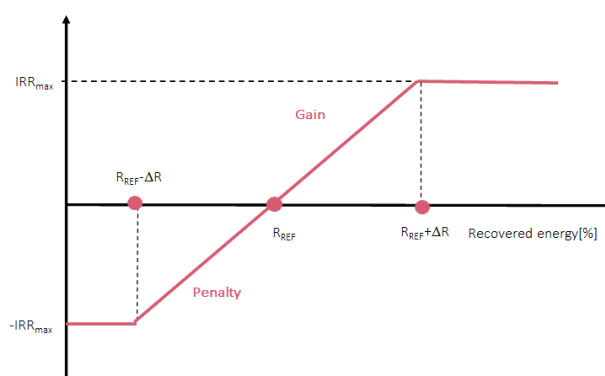
According to information from the RND operator, the amount recovered under component 2 in 2022 was 7 082 148 €. Since the sharing percentage k = 25%, the premium to be received under component 2 is

$$PP_2 = 7\,082\,148 \times 0.25 = 1\,770\,537 \text{ €}$$

COMPONENT 3

Component 3 of the incentive mechanism for reducing losses in distribution networks corresponds to an additional incentive (premium or penalty) applied to the success of actions to combat illicit consumption. It corresponds to a linear incentive mechanism, limited to a maximum premium or penalty depending on the energy recovered each year, as illustrated in Figure 3-6.

Figure 3-6 – Component 3 of the incentive mechanism for reducing losses in distribution networks



Source: ERSE

Table 3-2 summarises the parameters of component 3 of the incentive to reduce losses in the distribution networks in 2022.

Table 3-2 – Parameters for component 3 of the incentive in 2022

Reference value R_{REF} (GWh)	Unit value of recovered energy V_{p3} (€/MWh)	Maximum premium or penalty $IRR_{max} = -IRR_{min} = R_{REF} \times V_{p3}$ (€)
120	50	6 000 000

Source: ERSE

According to information from E-REDES, the energy recovered under component 3 of the incentive totalled 125.817 GWh. With $R_{REF} = 120$ GWh, and $V_{p3} = 50$ EUR/MWh, the RND operator is entitled to a premium of

$$PP_3 = (125\,817 - 120\,000) \times 50 = 290\,850 \text{ €}$$

Implementation of the incentive to reduce losses in distribution networks in 2022

Under the terms described above, the application of the incentive to reduce losses in the distribution network for the year 2022 results in a premium of:

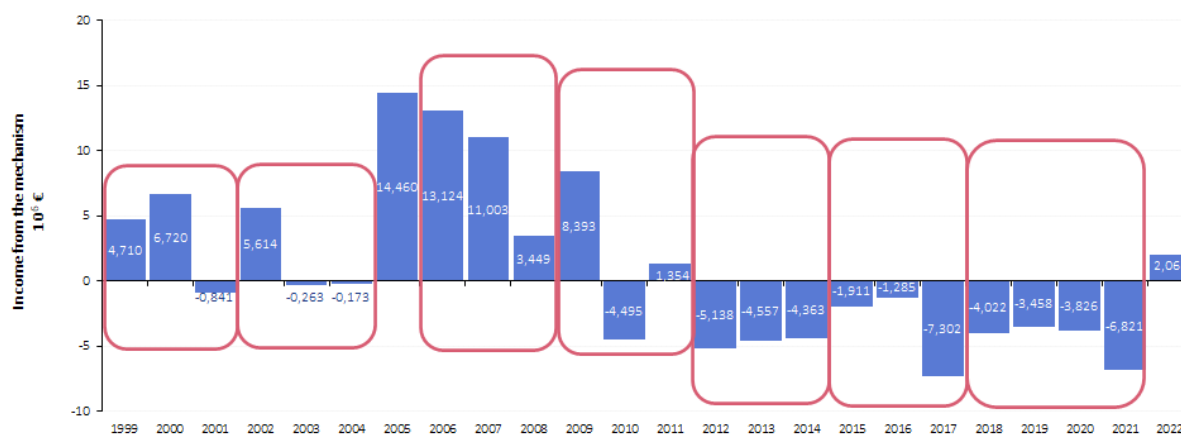
$$PP = PP_1 + PP_2 + PP_3$$

$$PP = 0 + 1\,770\,537 + 290\,850 = 2\,061\,387 \text{ €}$$

Figure 3-7 shows the evolution of the amounts resulting from the application of the incentive mechanism to reduce losses in the distribution networks since 1999, and it should be noted that from 2012 to 2021 there was a penalty for the fact that the value of the actual losses incurred was higher than the limit value of the neutral band.

In 2022, as mentioned above, the operator receives a premium of 2.061 million euros due to the performance of components 2 and 3 of the incentive, given that component 1 had no contribution due to the fact that the value of the losses occurred in the neutral band.

Figure 3-7 – Evolution of the amounts associated with the application of the incentive mechanism to reduce losses in the distribution networks



3.1.1.2 TECHNICAL QUALITY OF SUPPLY

In mainland Portugal and in the Autonomous Regions of the Azores and Madeira, ERSE's Quality of Supply Code (RQS)¹¹ and Tariffs Code (RT) include provisions for regulating the continuity of supply¹².

CONTINUITY OF SUPPLY

The transmission and distribution networks are described in terms of continuity of supply, based on indicators for each system (transmission and distribution), specifically, the time/duration of the interruption and its frequency (TIE/TIEPI/SAIFI/SAIDI - please refer to the list of definitions of indicators in Annex III).

The RQS establishes that the assessment of the performance of the transmission and distribution network, in terms of continuity of supply, applies not only to long interruptions (longer than 3 minutes) but also to short interruptions (between 1 second and 3 minutes), according to the MAIFI indicator (see the indicator definition list in Annex III). Table 3-3 shows the continuity of supply indicators for mainland Portugal¹³ in 2023¹⁴.

¹¹ Regulation No. [826/2023](#) of 28 July, which approves the ERSE Quality of Supply Code for the electricity and gas sectors and the corresponding Manual of Procedures.

¹² In addition to this technical quality, the RQS also establishes obligations related to voltage quality and commercial quality.

¹³ Indicators referring to REN's transmission network and E-REDES's distribution network (HV, MV and LV)

¹⁴ Information on the historical evolution of the continuity of supply indicators is available at (in Portuguese):

<https://www.erse.pt/eletricidade/qualidade-de-servico/#relatorio-anual>

<https://www.erse.pt/eletricidade/qualidade-de-servico/#tecnica>

Table 3-3 – Continuity of supply indicators in mainland Portugal, 2023

Voltage Level	Indicator	Interruptions		
		Planned	Unplanned	
			Operator Responsibility	Exceptional Events
EHV Transmission	TIE (min)	0	0.39	27.61
	SAIFI (int)	0	0.07	0
	SAIDI (min)	0	0.65	25.87
	MAIFI (int)	0	0.05	0
HV Distribution*	SAIFI (int)	0	0.28	0.03
	SAIDI (min)	0	4.73	3.96
	MAIFI (int)	0	0.60	0
MV Distribution*	TIEPI (min)	0.04	48.10	8.16
	SAIFI (int)	0	1.57	0.23
	SAIDI (min)	0.05	61.77	12.70
	MAIFI (int)	0	8.52	0.60
LV Distribution*	SAIFI (int)	0.00	1.60	0.17
	SAIDI (min)	0.68	77.23	9.64

Source: REN and E-REDES data

In relation to 2023, the continuity of service indicators which assess the performance of the transmission network generally deteriorated compared to the previous year. These results were influenced by the occurrence of an exceptional event caused by a fire that disconnected the 220 kV Carregado – Seixal overhead line, which supplies electricity to the customer “Siderurgia Nacional – Seixal”. This customer, exclusively supplied by this extra high voltage line, was interrupted for 2 225 minutes, with the indicator on energy not supplied (ENS) equal to 2 543.70 MWh, thereby meeting the criteria to be designated as a major impact incident.

In 2023, the continuity of service indicators show that, for distribution networks, unplanned interruptions have the most significant impact (Table 3.3). This performance was related to various causes, such as faults in electrical equipment, faults resulting from network maintenance activities, and natural phenomena.

Figure 3-8 and Figure 3-9 show the annual evolution of the general continuity of supply indicators registered respectively in the transmission network and in the distribution networks in mainland Portugal, between 2014 and 2023.

Figure 3-8 – Evolution of the general indicators of continuity of supply in the transmission network, in mainland Portugal

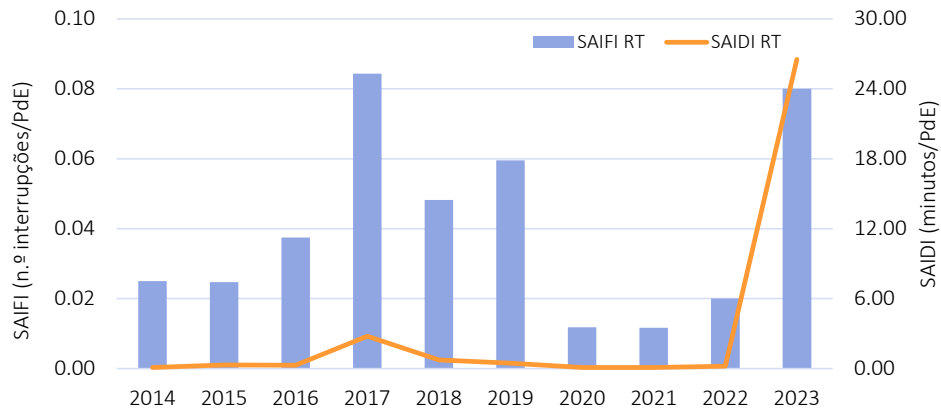
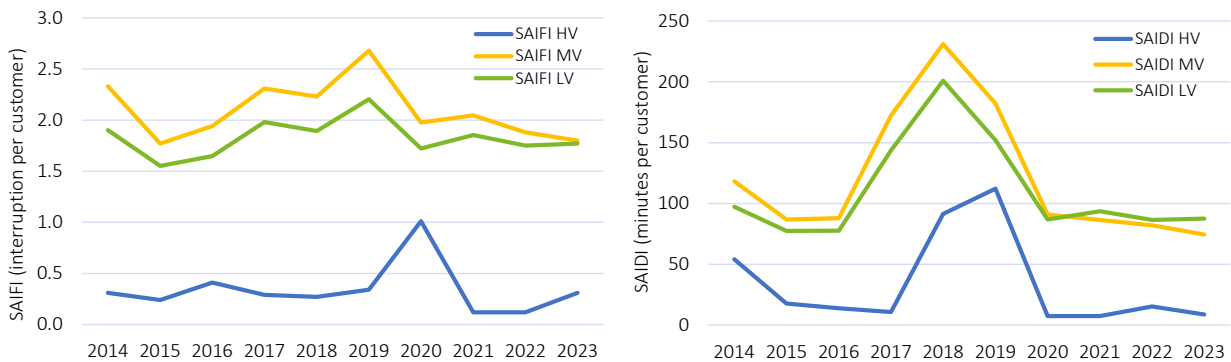


Figure 3-9 – Evolution of the general indicators of continuity of supply in distribution networks, in mainland Portugal



In addition, the RQS sets individual standards for continuity of supply (annual number and duration of interruptions), which constitute a commitment to the customer by the network operator. If the network operator fails to comply with these standards, it has an obligation to pay a monetary compensation¹⁵ without the need for the customer to request it.

In 2023, E-REDES provided provisional data on (non-)compliance with the individual standards: there were 49 314 instances of non-compliance in mainland Portugal, of which 47 479 were related to the duration of interruptions and 1 835 to the total number of interruptions, leading to compensation in the amount of

¹⁵ This payment aims at compensating the customer in case of non-compliance with this indicator. It does not include any payment for damages caused by interruptions.

497 000 euros. In 2022, there were 64 020 instances of non-compliance in mainland Portugal, of which 60 070 were related to the duration of interruptions and 3 950 to the total number of interruptions, leading to compensation in the amount of 765 000 euros.

Table 3-4 shows the continuity of supply indicators for the Autonomous Region of the Azores in 2023.

Table 3-4 – Continuity of supply indicators in the Autonomous Region of the Azores, 2023

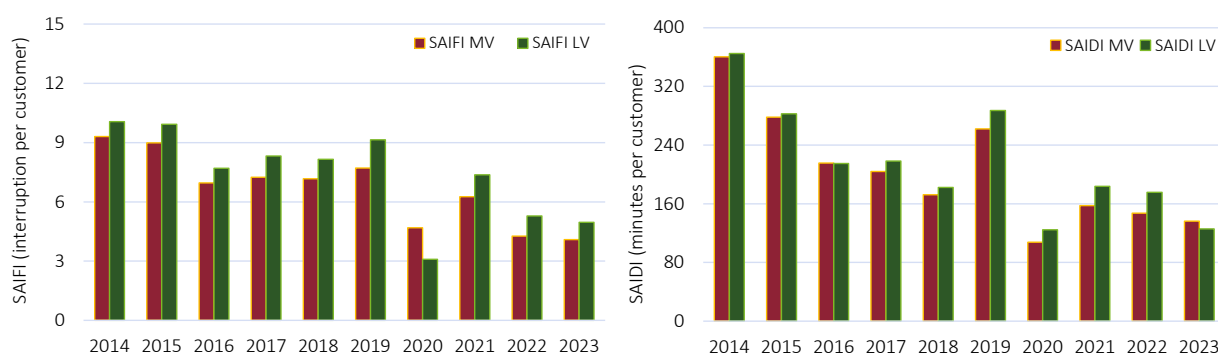
Voltage Level	Indicator	Interruptions		
		Planned	Unplanned	
			Operator Responsibility	Exceptional Events
MV Distribution	TIEPI (min)	30.98	59.42	16.75
	SAIFI (int)	0.50	3.00	0.59
	SAIDI (min)	36.65	72.82	26.87
	MAIFI (int)	0.90	1.89	0.20
LV Distribution	SAIFI (int)	0.56	3.68	0.72
	SAIDI (min)	31.00	94.57	33.67

Source: EDA data

In 2023, the continuity of supply indicators in the Autonomous Region of the Azores recorded an improvement on the previous year. The reduction in unplanned interruptions under the responsibility of the network operator contributed to these results.

Figure 3-10 shows the annual evolution of the general continuity of supply indicators registered in the distribution networks in the Autonomous Region of the Azores, between 2014 and 2023.

Figure 3-10 – Evolution of the general continuity of supply indicators in the distribution networks, in Autonomous Region of the Azores



In 2023, there were 12 instances of non-compliance in the Autonomous Region of the Azores, were related to the duration of interruptions on the low voltage network, leading to compensation in the amount of 226 euros. In 2022, there were 25 instances of non-compliance related to the duration of interruptions, of which 20 were related to the total number of interruptions and five to the duration of interruptions. Customers received 888 euros in compensation.

Table 3-5 shows the continuity of supply indicators for the Autonomous Region of Madeira, in 2023.

Table 3-5 – Continuity of supply indicators in the Autonomous Region of Madeira, 2023

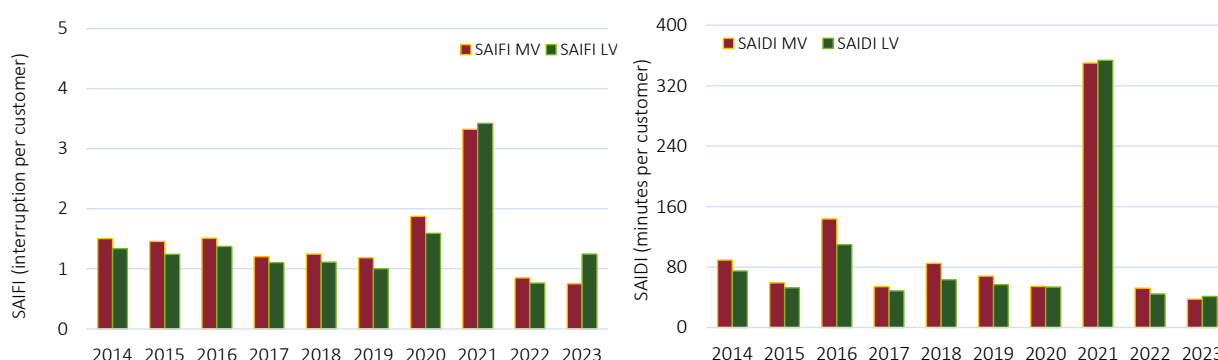
Voltage Level	Indicator	Interruptions		
		Planned	Unplanned	
			Operator Responsibility	Exceptional Events
MV Distribution	TIEPI (min)	12.87	15.57	1.61
	SAIFI (int)	0.20	0.51	0.05
	SAIDI (min)	16.84	20.84	3.64
	MAIFI (int)	0.02	0.23	0.01
LV Distribution	SAIFI (int)	0.19	0.52	0.54
	SAIDI (min)	19.93	21.17	23.04

Source: EEM data

In 2023, the continuity of supply experienced by customers in the Autonomous Region of Madeira recorded an improvement compared to the previous year. The reduction in unplanned interruptions under the responsibility of the network operator contributed to these results. It is noteworthy that the annual trend of improvement in most of the continuity of service indicator values has continued over the years, with the exception of 2021, which was marked by the occurrence of extreme weather conditions that affected various electrical infrastructures, causing a blackout of the electrical system on the island of Madeira.

Figure 3-11 shows the annual evolution of the continuity of supply indicators recorded in the distribution networks in the Autonomous Region of Madeira, between 2014 and 2023.

Figure 3-11 – Evolution of the general continuity of supply indicators in the distribution networks, in Autonomous Region of the Madeira



In 2023, there were 41 instances of non-compliance related to the duration of the interruptions, mostly due to non-compliance at standard low voltage (LV) customers. Customers received about 1 316 euros in compensation. In 2022, there were 186 instances of non-compliance related to the duration of the interruptions and customers received about 1 464 euros in compensation.

It should be noted that, in accordance with the RQS, ERSE publishes a quality of supply report on a yearly basis, to present and assess the quality of supply for the activities covered by the electricity sector¹⁶.

INCENTIVE TO IMPROVE CONTINUITY OF SUPPLY

The RT establishes an incentive to improve continuity of supply with repercussions on the allowed revenue for the medium-voltage (MV) and high-voltage (HV) distribution network operators in mainland Portugal. This incentive is aimed, on the one hand, at promoting the global continuity of electricity supply ("component 1" of the incentive), and, on the other hand, at encouraging the improvement of the continuity of supply level among the worst-served customers ("component 2" of the incentive).

The value of "component 1" of the incentive depends on the annual value of non-distributed energy and is determined using the function set out in the RQS. In 2023, the maximum value of the premium or penalty corresponded to 6 million euros. The determination of the value of non-distributed energy excludes interruptions justified for safety reasons, interruptions related to the national transmission network, as well as interruptions classified by ERSE as exceptional events.

¹⁶ Information on the historic evolution of the continuity of supply indicators is available at: <https://www.erse.pt/eletricidade/qualidade-de-servico/#tecnica>

"Component 2" was introduced in the 2014 regulatory review, and applied for the first time to the network's performance in 2015. The value of "component 2" of the incentive depends on the moving average of the last three years of the SAIDI MV indicator (see the indicator definition list in Annex III) that covers 5% of distribution transformer stations and MV customers with the worst SAIDI MV value each year. The determination of the SAIDI MV value that covers 5% of distribution transformer stations and MV customers excludes interruptions classified by ERSE as exceptional events, as well as interruptions originating from security reasons and originating from the transmission network. The value of "component 2" is determined using the function established in the RQS. In 2023, the maximum value of the premium or penalty corresponded to 3 million euros.

Regarding the value of the amount inherent to "component 1" of the incentive mechanism to improve the continuity of supply, based on the values of 40 207 GWh of distributed energy and 47.71 minutes of TIEPI MV, the value of 3.65 GWh was estimated for non-distributed energy, which corresponds to an increase in the income of the main distribution system operator (DSO) of around 3.3 million euros in 2023. With regard to the value of the amount inherent in "component 2", based on the value of 303.63 minutes obtained for SAIDI MT relative to the set of 5% of distribution transformation stations and customers in MT, the value of the amount obtained was 3 million euros in 2023.

3.1.1.3 SAFEGUARD MEASURES

In the event of a sudden crisis in the energy market or a threat to the safety and physical integrity of people, equipment, installations and networks, namely due to a serious accident or other event of force majeure, and when the declaration of an energy crisis is not justified, the member of the Government responsible for energy may temporarily take the necessary safeguard measures¹⁷.

During 2023, Council of Ministers Resolution 82/2022 of 27 September remained in force, which, following the drought experienced during 2022, establishes a strategic reserve of water in the reservoirs associated with the hydropower plants for the purposes of security of supply to the SEN, in order to ensure that storage in these reservoirs reaches at least a capacity corresponding to an increase in stored electricity of around 760 GWh, distributed generally proportionally among the hydropower plants.

¹⁷ Article 101 of Decree Law no. 15/2022, of 14 January.

3.1.1.4 GENERATION WITH ENDOGENOUS, RENEWABLE AND NON-RENEWABLE RESOURCES AND COMBINED HEAT AND POWER

In mainland Portugal, with the entry into force of Decree Law no. 76/2019 of 3 June, the legal framework for special regime generation was revised, allowing them to operate under the guaranteed remuneration regime as well as the general remuneration regime. Under the guaranteed remuneration regime, producers sell their electricity at a guaranteed price over a given period (fixed or indexed to a benchmark, with or without setting minimum and/or maximum thresholds), while a competitive mechanism is used to define the guaranteed tariff. Under the general remuneration regime, producers sell their electricity at market price.

The publication of Decree Law no. 15/2022 of 14 January, that established the organisation and operation of the National Electric System (SEN), eliminated the concepts associated with ordinary and special regime generation. This development resulted in simpler SEN workings, namely regarding electricity production licensing.

Regarding generation with support mechanisms, Dispatch no. 10835/2020 of 4 November, by the Directorate General for Energy and Geology¹⁸, sets generation reduction orders by the system operator seeking to control renewable generators with support mechanisms under exceptional operational circumstances in the SEN, namely during congestion or when continuity of supply and the balance between supply and demand may be disturbed.

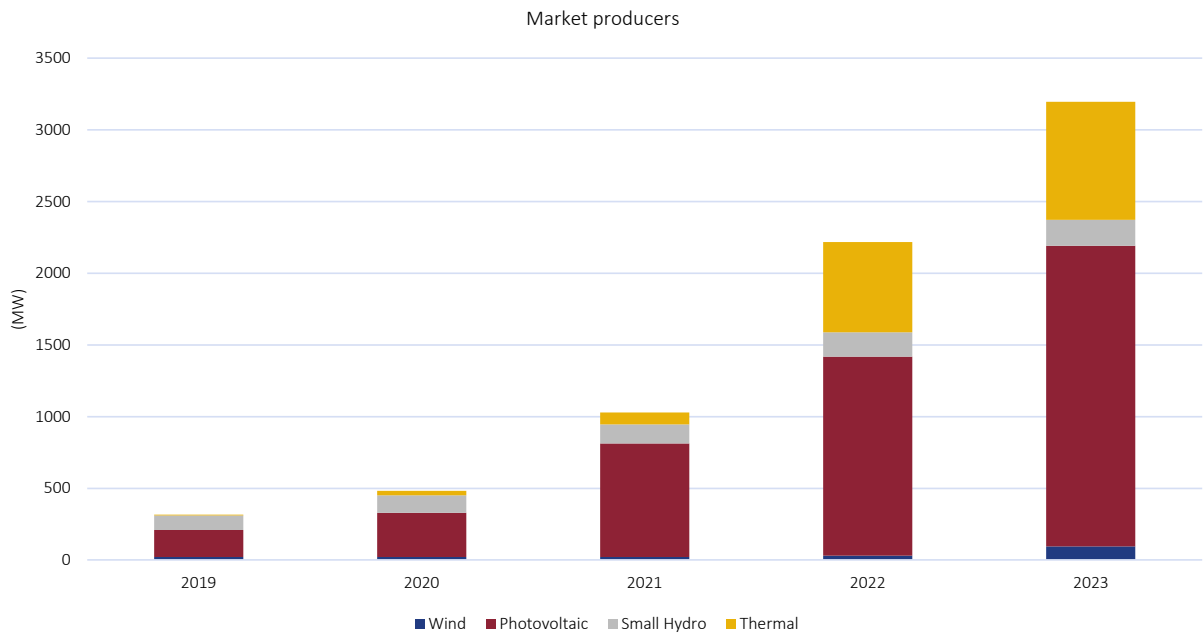
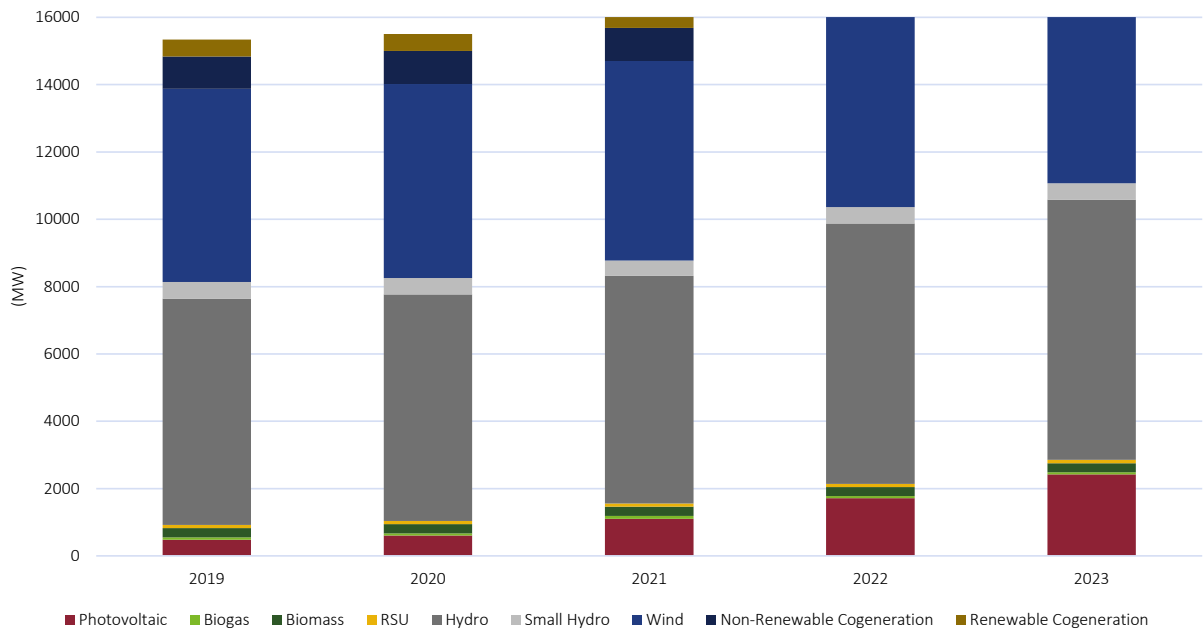
In 2023, the installed capacity of endogenous, renewable and non-renewable resources and combined heat and power (cogeneration) accounted for 88% of the total installed capacity of the Portuguese electricity system. From 2019 to 2023, this weight ranged between 76% and 88%.

Figure 3-12 shows the evolution of the endogenous, renewable and non-renewable resources and combined heat and power installed capacity with guaranteed pricing support and under market conditions between 2019 and 2023. In 2023, it is worth noting that approximately 3197 MW of endogenous, renewable and non-renewable resources and combined heat and power installed capacity participates

¹⁸ Dispatch no. 10835/2020 of 4 November, by the Directorate General for Energy and Geology, which establishes the rules and procedures for reducing installed capacity for special regime generation which benefits from guaranteed pricing or other support mechanisms.

directly in the market, composed of mini-hydro (6%), photovoltaic (65%), wind (3%) and thermal (26%) technologies.

Figure 3-12 – Endogenous, renewable and non-renewable resources and combined heat and power installed capacity, 2019 to 2023

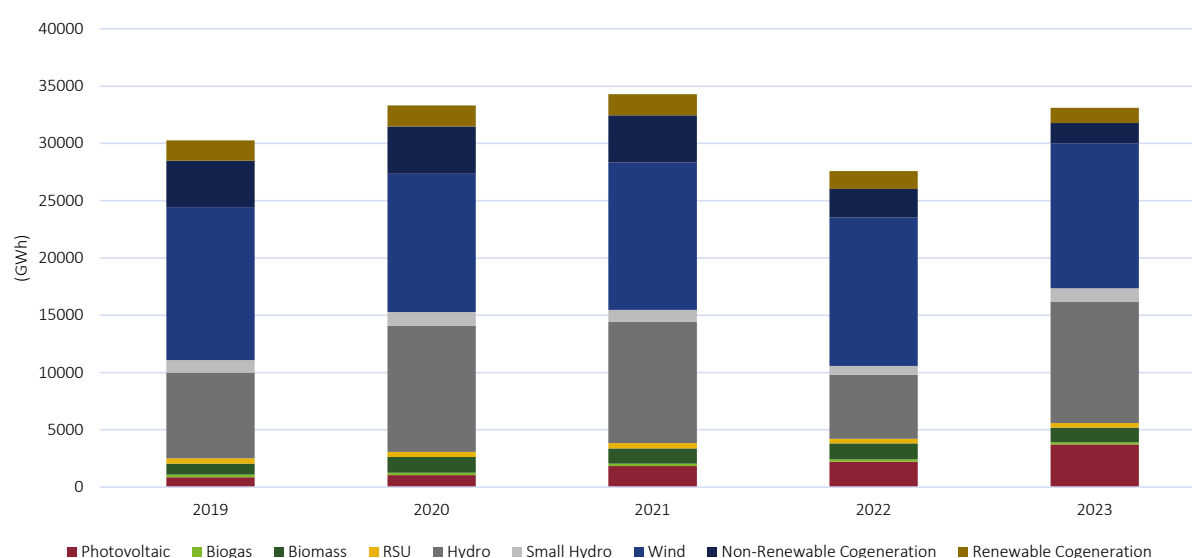


Source: REN data, Note: RSU means Solid Urban Waste

Regarding the electricity produced in 2023, approximately 33 TWh came from endogenous, renewable and non-renewable resources and combined heat and power, representing 75% of the total electricity produced, a figure that ranged between 55% and 75% between 2019 and 2023.

Figure 3-13 shows the evolution of endogenous, renewable and non-renewable resources and combined heat and power production between 2019 and 2023, broken down by technology.

Figure 3-13 – Endogenous, renewable and non-renewable resources and combined heat and power electricity production, 2019 to 2023



Source: REN Data, Note: RSU means Solid Urban Waste

The previous figures highlight the importance of endogenous, renewable and non-renewable resources and combined heat and power, and in particular renewable energy sources, in the energy mix of the Portuguese electricity system.

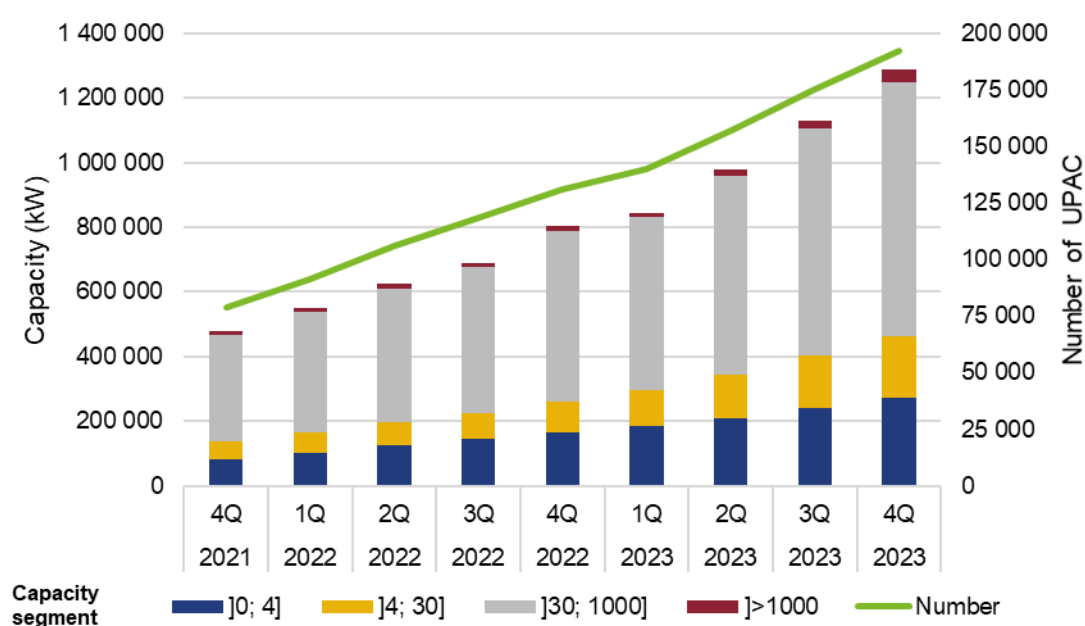
In 2023, there was a pronounced increase in hydropower generation compared to 2022, due to a more favourable hydrological regime, and in photovoltaics, due to the increase in installed power.

ELECTRICITY SELF-CONSUMPTION AND RENEWABLE ENERGY COMMUNITIES

The number of self-consumers and the installed capacity in renewable self-consumption has been growing significantly over the last two years. While self-consumers increase mainly in the segment of installed capacity up to 4 kW (representing 90% of self-consumers), the increase in installed capacity occurred

mainly in the commercial and industrial segment (from 30 kW to 1000 kW) especially in MV. At end of 2022, the number of self-consumers was around 130 000 reaching 192 000 by the end of 2023. Installed capacity rose from 804 MW in 2022 to 1 288 MW at the end of 2023 (over 60% increase). The electricity generated and self-consumed is estimated to represent 82% of the total estimated generation for self-consumption¹⁹ (1 793 GWh) in 2023. The surplus electricity injected into the electricity grid totalled to 326.7 GWh in 2023, and 43% was traded in the electricity market.

Figure 3-14 – Evolution of installed capacity and amount of UPAC



Source: E-Redes, S.A. Note: UPAC means self-consumption production unit

The development of collective self-consumption (CSC) and renewable energy communities has been slower, due to the complex nature of these models and some licencing difficulties. At the end of 2023', there were 32 cases of CSC in operation, totalling 1.9 MW of installed capacity and 96 participating consumer installations. In the existing CSC in 2023, energy sharing was carried out by means of a method proportional to consumption of each participating installation.

¹⁹ Considering generation for self-consumption in 2023 according to the Directorate-General for Energy and Geology "[Renewable energies quick statistics](#)".

3.1.1.5 REGULATORY DEVELOPMENTS

Review of the Code on Network Operations

Following Public Consultation no. 113, ERSE approved the revision of ROR²⁰, in order to fully frame it in the European network codes and regulations, which promote an integrated European market also at network operation level. The regulation acknowledges smart grids as the new normal of the electricity sector, as well as managing the network, using flexibility resources available in generation, storage and consumer's installations (for example, through aggregation), of whatever size.

The ROR widened its scope beyond the traditional system management activity, including distribution network operation and the use of flexibility resources. The ROR now applies to the power systems of Azores and Madeira regions, clarifying common features with the mainland and regulating specific ones.

With this revision, the ROR harmonised concepts and terms with the European network codes, facilitating its understanding by market agents participating in several European markets. The ROR also recognises new entities relevant to system management, such as the Regional Coordination Centre (CORESO) or the European platforms for exchanging balancing energy.

The ROR also includes a set of principles relating to the participation of new actors in system management, namely decentralised generation, storage and demand response.

Concerning the technical management of distribution networks, the ROR establishes a general framework and a new sub-regulation (Manual of Procedures), for the specificities of distribution networks.

Review of the Code on Access to Networks and Interconnections

Following the aforementioned Public Consultation no. 113, ERSE approved changes to the Code on Access to Networks and Interconnections (RARI²¹).

The new RARI contributes to the implementation of the legal framework established by Decree Law no. 15/2022, of 14 January, namely the possibility of access to the networks with restrictions on injection

²⁰ The current ROR was approved by [Regulamento no. 816/2023](#), of 27 July.

²¹ The RARI was approved by [Regulamento no. 818/2023](#), of 27 July.

capacity into the Public Service Electricity Grid (RESP). making it possible, on the one hand, to optimise the use of network assets and, on the other hand, to realise a probabilistic network planning and management model based on an innovative model of active, dynamic and flexible management, which make it possible to integrate new production from renewable energies, helping to achieve the goals of the energy transition.

To this end, the RARI establishes the contractual procedures associated with access to the network with restrictions, in conjunction with the connection conditions set out in the capacity reservation licences provided for in Decree Law 15/2022. The RARI also covers new matters and new entities covered by RESP access, use and remuneration, such as autonomous storage facilities and aggregators. In this context, the structure of the Code separates the network access rules from the implementation of network use contracts.

Finally, the RARI establishes a set of methodologies to be adopted by network operators to substantiate investment options, comparing them with other alternatives, including the use of market procurement of flexibility solutions.

Review of the Electricity Self-Consumption Code

ERSE approved the revision of the RAC²². The review of RAC aimed to update the code to changes in the respective legal regime, integrated in Decree Law no. 15/2022, of 14 January. The main changes include: attributing to the DSO the responsibility (and cost) of adapting meters in consumer installations participating in self-consumption; new modes for energy sharing in collective self-consumption using dynamic systems or hierarchical criteria; the new figure of the aggregator of last resort, replacing the previous market facilitator, who is in charge of buying energy surplus from self-consumers; and the new figure of citizen energy communities, which can also engage in collective self-consumption.

Considering that Decree Law no. 15/2022, of 14 of January, established an obligation to rollout smart meters until the end of 2024, and in line with the general rule for consumption data handling in smart grids, the RAC established the obligation for the DSO to make available on a daily basis detailed and individual consumption and injection data, after validation and 15 minutes netting.

²² The RAC was approved by [Regulamento no. 815/2023](#), of 27 July.

Review of the Code on Smart Grid Services

Following Public Consultation no. 113, ERSE approved the review of the RSRI²³.

Decree Law no. 15/2022, of 14 January, introduced relevant developments regarding smart grid implementation in Portugal, either in terms of concepts (for example, defining smart meter and smart grid infrastructure), or in concrete realisations such as the rollout of smart meters and their integration in smart grid infrastructure, until the end of 2024, for all end users.

Having this framework in mind, ERSE reviewed its codes, adopting smart grids as the new reference for network services at low voltage across its regulatory activities. Thus, the purely voluntary logic for smart grid development was abandoned. The scope of the RSRI now includes all low voltage network users such as special low voltage consumers or storage installations.

Finally, a major part of the previous RSRI rules were integrated into the rest of ERSE's codes, in particular in the RRC and RQS.

The RSRI establishes the obligation for the DSO to collect on a daily basis load diagrams for all installations connected to a smart grid, aligning the practice for normal low voltage consumers in smart grids with the standard in all other voltage levels.

Incentives for Optimal Management of CO₂ Emission Allowances in the Azores and Madeira

ERSE Directive n. 2/2014, of 3 January, which revoked ERSE Order n. 11210/2008, of 17 April, established the mechanism for optimising the management of carbon dioxide (CO₂) emission licences, following a new legal framework for the European Union Emissions Trading Scheme (EU ETS), which, in turn, dictated changes both in the operation of the emissions markets and in their valuations, with an impact on the operation of the Portuguese electricity sector.

The mechanism for optimal management of CO₂ emission allowances aimed at optimising the management of CO₂ emission licenses of the power plants with non-terminated Power Purchase Agreements (CAE) (complementing the previous mechanism), as well as of the power plants managed by EDA - *Electricidade dos Açores* and EEM - *Empresa de Electricidade da Madeira* (whose generation costs are regulated by ERSE), respectively in the RAA (Autonomous Regions of Azores) and RAM (Autonomous Regions of Madeira).

²³ The RSRI was approved by [Regulamento no. 817/2023](#), of 27 July.

Directive n. 2/2014, of 3 January, was revoked with the entry into force of Directive n. 2/2021, of 19 January, which establishes the incentive for the optimised management of non-terminated CAE.

As regards the EU ETS, 2021 presents a specific characteristic, which was also reflected in the modification of the valuation of the emission licenses themselves, resulting from the change in the governance model of the EU ETS, including, for example, the mandatory purchase of emission licenses for part of the transport sector. It should be noted that, at the end of 2020 and even in early 2021, the context conditions of the EU ETS mechanism were not fully stabilised, with uncertainty regarding the involvement of certain sectors in these conditions: the transport sector, including air transport in particular; this made it uncertain how much excess demand there would be for allowances in the market and, consequently, how the price of allowances would evolve.

In this context, the proper application of an incentive with the characteristics established in Directive n. 2/2014 - which seeks to induce, from the outset, a risk mitigation behaviour with temporal distribution of market interventions - depends on market stability conditions, which did not occur in 2021.

Having concluded the adaptation phase for the new EU ETS, embodied by the year 2021, it was possible to envisage the specification of a new regime for the efficient management of the acquisition of CO₂ licences by EDA and EEM, relative to the thermal power plants covered by the EU ETS.

For these reasons, ERSE decided to launch of a comprehensive discussion, through a consultation procedure for interested parties, to ensure continuity of the regulatory framework for incentives for the optimised management of CO₂ emission allowances in the RAA and RAM, in order to enable the efficient management of the acquisition of CO₂ licences by the Autonomous Regions.

Following the consultation procedure, Directive no. 5/2023, of 16 January, was published, approving the incentives for optimal management of CO₂ emission allowances in the RAA and RAM, with the incentive scheme applying from 1 January 2023.

Review of the Manual of Procedures of the Global Management System to adopt the standard balancing product – manually activated Frequency Restoration Reserves (mFRR)

In December 2023, ERSE reviewed the MPGGS²⁴, aiming to implement ACER Decision no. 3/2020, of 24 January, changed by ACER Decision no. 14/2022, of 30 September, on the implementation framework for the European platform for the exchange of balancing energy from frequency restoration reserves with manual activation (MARI platform).

The revision of MPGGS also included other relevant aspects, such as replacing the specific balancing capacity product “reserva de regulação” by the new mFRR specific capacity product (also a specific product aimed mostly at industrial consumers), but also incorporating the rules for participation of demand in ancillary services, allowing to end the pilot-project that ran since 2019 for that purpose.

Implementing the standard mFRR energy product comes from the European network codes, especially Regulation (EU) 2017/2195 of the Commission, of 23 November, establishing guidelines on electricity balancing (EB Regulation) and Regulation (EU) 2017/1485 of the Commission, of 2 August, establishing guidelines on electricity transmission system operation (SO Regulation). This implementation of network codes greatly impacts the functioning of ancillary service markets, thus it has been implemented gradually. ERSE will approve, in 2024, a new revision of MPGGS, this time to implement the standard balancing energy and capacity products for aFRR.

With the approval of the mFRR product rules in December 2023, and after a period for the adaptation of IT systems by the global system manager (GGS) and market agents, the energy market for mFRR started functioning in 14 March 2024. On this day, the application of the imbalance settlement harmonised procedures also began, approved in December 2022. The integration in MARI by the Portuguese TSO should occur during the first semester of 2024.

Implementation of the manual Frequency Restoration Reserves capacity market (BmFRR)

The ROR, as approved by ERSE Regulation no. 816/2023, of 27 July, incorporated the normalised balancing products, as defined by European regulation, and determined that the TSO adopt them, namely mFRR and aFRR and join the European platforms MARI and PICASSO, respectively.

²⁴ The MPGGS was published by [Diretiva no. 19/2023](#), of 26 December.

The MPGGS defines all the rules applicable to ancillary services in Portugal, as approved by ERSE in Directive no. 19/2023, of 26 December, as set by the ROR and RRC, approved by ERSE Regulation no. 827/2023, of 28 July.

In order for the TSO to implement the standard balancing products, namely mFRR, to elicit the future connection to the MARI platform, several changes were made to the MPGGS, such as the end of the tertiary reserve market (“reserva de regulação”), thus the specific balancing capacity product had to be adapted to mFRR, as proposed by the TSO to ERSE, through an improvement on Procedure no. 15 of the MPGGS, taking into account the TSO’s experience with the “Regulatory Reserve Band” (“Banda de Reserva de Regulação”).

Article 26 (1) of EBGL Regulation foresees the development of specific balancing products, subject to the approval of the NRA, as set by Article 5 (4) of said Regulation, including its Terms and Conditions, that are developed and submitted by the responsible TSO.

Following the improvement proposal presented by the TSO (per Article 26 (2)), with the Terms and Conditions for the BmFRR, ERSE made the necessary changes to the MPGGS that were subject to prior specific consultation, which enabled stakeholders to express their views, before its approval by ERSE in Directive no. 18/2023, of 22 December.

Pilot project on participation of demand in the regulation reserve market

The pilot project for consumer participation in the regulation reserve market, approved for one year by Directive 4/2019 of 15 January and extended by Directive 6/2020 of 20 April, came to an end in 2023.

With the approval of the ROR by Regulation no. 816/2023 of 27 July, following ERSE's Public Consultation no. 113 and the experience gained during the pilot project, measures were adopted to enable consumption to participate in the system services markets on a regular and permanent basis.

Since it began in July 2019, 27 agents have taken part in the pilot project, and 73 982 MWh have been mobilised, corresponding to a turnover of 5.6 million euros.

Pilot project for contracting flexibility services in the distribution network

At the end of 2023, ERSE approved the pilot project “Integrated Flexibility in Market Regime - FIRMe”, promoted by E-REDES, within the scope of the ROR.

The FIRMe pilot project, expected to last two years, aims to develop local flexibility markets and incorporate flexibility alternatives as a complement to investment, through the use of eight use cases, distributed across three types of services: restore, dynamic and secure. These services apply to specific situations, respectively, the response to distribution network failure events, constraints arising during scheduled unavailability of distribution network assets and the management of consumption peaks in the normal regime of the distribution network.

Flexibility²⁵ is very important to facilitate and accelerate the energy transition and all interested parties can participate in these services. In addition to the network operator, 15 flexibility service providers participate in the pilot project, individually or in aggregate, using 32 installations or equipment connected at various points in the distribution network, including generation, storage and consumption.

The experience and recommendations that result from the pilot project will be reflected in the development of the regulatory framework, in particular at the level of the Manual of Procedures for the Technical Management of electricity distribution networks, provided for in the ROR.

Methodologies for estimating electricity and gas consumption profiles and methodologies for loss profiles and the adequacy factor in the electricity sector

At the end of 2023, ERSE approved, after public discussion, the following set of methodologies: 1) estimation of consumption and injection profiles for the electricity sector; 2) estimation of consumption profiles for the gas sector; 3) construction of loss profiles in the transmission network and distribution networks of the electrical sector; and 4) calculation and imputation of the adequacy factor in the electricity sector.

In the case of consumption and injection profiles and loss profiles, the main motivation was the simplification of the annual approval processes for the respective values, along with a reinforcement of transparency and the participation of the various interested parties in the development of the methodologies that serve as basis for this approval.

²⁵ Understood as the ability of facilities connected to the network to change their consumption or injection into the network, temporarily, depending on the needs communicated by the operator. The mobilisation of this flexibility available in existing installations facilitates the integration of renewable generation into the network and the network's response capacity to new electrical consumption, particularly for charging electric vehicles or replacing heating fuels through heat pumps.

The methodologies for constructing consumption and injection profiles and loss profiles will be the basis for the annual calculation of profile values by the respective operators, without direct intervention from ERSE, which will be responsible for supervising the application of approved methodologies and compliance with other obligations in this matter.

Regarding the rules for imputing the adequacy factor, the change was more profound. In effect, the rules previously in force determined the application of the adequacy factor to non-remotely read consumption (i.e. an increasingly less significant part of the normal low voltage segment). Recognising that the uncertainty associated with estimating consumption is decreasing (by the end of 2024 all normal low voltage facilities must be integrated into a smart grid, with daily collection of load diagrams), the adequacy factor now fundamentally reflects the effect of the error in estimating losses, which are very concentrated in low voltage. Furthermore, phenomena such as the unsold self-consumption surplus (which reduces total losses) or the change in losses due to the active participation of demand have effects, above all, on low voltage losses, and also impact the energy to be reconciled. In this way, the adequacy factor now focuses on the low voltage consumption (normal and special) of the supplier portfolios.

3.1.2 NETWORK TARIFFS FOR CONNECTION AND ACCESS

REGULATORY FRAMEWORK

ERSE is responsible, in particular, for approving the methodology for calculating tariffs and prices for the electricity sector, the methodologies for regulating allowed revenues, as well as approving tariffs for access to the transmission and distribution networks and transitional tariffs (the latter applicable to suppliers of last resort)²⁶ and approving the prices of regulated services.

The tariff calculation methodology and regulation methodologies comply with the provisions of ERSE's Electricity Tariffs Code (RT), which is drawn up and approved by ERSE, after public consultation and the

²⁶ Under the terms of its Statutes, approved by Decree Law no. 97/2002, of 12 April, as amended.

mandatory but non-binding opinions of its advisory bodies, in particular the Tariff Council. The tariff approval process, including its timing, is also regulated by the RT.

The tariffs in force in 2023, including electricity network access tariffs, are the result of the rules established in the electricity RT, approved by [Regulation no. 785/2021](#), of 23 August, rectified by Declaration of rectification no. 813/2021, of 16 November.

PROCEDURES AND METHODOLOGY FOR CALCULATING ELECTRICITY NETWORK ACCESS TARIFFS

Network access tariffs are charged to all electricity consumers for the use of the public service electricity network infrastructure. Generally speaking²⁷, these tariffs are paid by suppliers on behalf of their customers and passed on in the final price.

The revenues generated from regulated activities are recovered through specific tariffs, each with their own tariff structure. They are characterised by a set of billing variables. ERSE approves the following tariffs: Global Use of the System, Use of the Transmission Network to be applied to generators entering Transmission National Grid (RNT) and the Distribution National Grid (RND), Use of the Transmission Network at EHV and HV, Use of the Distribution Networks at HV, MV and LV and Switching Logistics Operation. The billing variables are capacity, active energy, and reactive energy.

Tariff prices for each activity are established so as to ensure that their structure follows the structure of the marginal costs of the activity and that the allowed revenues for each activity are recovered. The tariff design, including billing variables, is based on the principle of (i) tariff uniformity, so that tariff system in place is universally applicable to all clients, promoting the convergence of the electricity systems of mainland Portugal and of the autonomous regions; and (ii) non-discrimination of the energy's end-use, with all tariff options available to all consumers.

Access tariff prices for each billing variable are determined by adding up the corresponding tariff prices per activity. Given that the tariffs contributing to this sum are based on marginal costs, an efficient use of resources is promoted and cross-subsidisation between consumers is avoided.

²⁷ Network access tariffs can also be paid by customers who are simultaneously market agents, i.e., customers who buy energy directly from the markets and are responsible for managing any possible schedule deviations.

This calculation methodology allows for a detailed knowledge of the various tariff components by activity or service. Therefore, each customer can know exactly how much they pay for a given service (for example, for the use of the HV distribution network), and how that amount is considered in terms of billing (in the referred example, billing variables are capacity and active energy). This methodology also allows for transparency as regards the way that revenues and tariffs are determined by the regulator.

Table 3-6 presents the electricity network access tariffs and their billing variables.

Table 3-6 – Electricity network access tariffs structure

Network access tariffs	Billing variables	EHV Clients	HV Clients	MV Clients	SpLV Clients	StLV Clients
Overall Use of the System	Capacity	●	●	●	●	●
	Active energy	●	●	●	●	●
Use of the Transmission Network	Capacity	●	●	●	●	●
	Active energy	●	●	●	●	●
	Reactive energy	●				
Use of the Distribution Network	Capacity		●	●	●	●
	Active energy		●	●	●	●
	Reactive energy		●	●	●	
Switching Operation	Capacity	●	●	●	●	●

Electricity consumption from electric vehicle charging points that are part of the public electric mobility network, consumption from autonomous storage facilities and self-consumption through the public network are also subject to payment of network access tariffs, with specificities compared to the network access tariffs applicable to consumption.

Therefore, under the terms of ERSE's Electric Mobility Code in force in 2023, those points that integrate the electric mobility network which are connected to the electricity public service network, pay the electricity network access tariffs applicable to electric mobility. The network access tariffs for electric mobility apply to electric vehicle users and are formed by an energy price per time period in euros per kWh²⁸.

²⁸ For more information regarding electric mobility, see point 6.4 in this document.

Since 2022, ERSE publishes the tariffs for access to networks to be applied to autonomous storage facilities. These tariffs result from the network access tariffs applicable to consumption less the charges corresponding to the Costs of General Economic Interest (CIEG) established in specific legislation [RT, article 54]. This deduction avoids a double payment of CIEG (in the phases of intermediate consumption for storage and final consumption by the customer), while ensuring the payment of network use tariffs (transmission and distribution). The structure and hourly breakdown of these tariffs are identical to those of network access tariffs.

With regard to self-consumption, network access tariffs apply for self-consumption using the public network for energy delivery. These tariffs are applicable on the consumption side and are determined in the reference frame of the self-consuming installation. Their structure replicates the network access tariffs, assuming the voltage level, the metering cycle and the tariff periods coincide with those of the network access tariffs applicable to consumption.

CONTESTATION OF TARIFF DECISIONS

Regarding appeals of a decision embedded in the electricity tariffs approved by the Regulator, in 2021 and 2022 several administrative actions were brought by energy producers against ERSE.

Several energy producers who adhered to the alternative remuneration regime provided for in Decree Law n.º 35/2013, of 28 February, filed more than 5 dozen lawsuits against ERSE, the State and/or SU Eletricidade, S.A. (SU Eletricidade), which are being heard in 13 different courts, essentially based on: i) an interpretation of this law that conflicts with Order no. 6304/2021, of 16 June, by the Assistant Secretary of State for Energy; ii) and as a result of ERSE Instruction n.º 11/2021, which makes it operational; iii) as well as SU Eletricidade's communications regarding the reconciliation values calculated under the terms of ERSE's instruction.

The producers are arguing for an interpretation of Article 5 of Decree Law no. 35/2013 that guarantees them remuneration for the electricity produced that is higher than that resulting from the contested Order and, moreover, from the ERSE instruction that implements it, from the moment it is applied. The arguments put forward by the producers have a common thread, around the "Agreement in Principle" that was reached on 27 August 2012 within the framework of the financial assistance plan for Portugal, between the member of the Government responsible for energy and APREN - the Portuguese Renewable Energy Association, the content of Decree Law no. 35/2013, the practice allegedly followed by SU Eletricidade and the principle of protecting trust. In some cases, with different intensities and developments, alleged defects

of incompetence, lack of authorisation and omission of formalities for the issuance of the contested Order are invoked, as well as the alleged violation of other Administrative and Constitutional principles.

The Braga Administrative and Fiscal Court, in a judgment of 19 April 2024, which can be appealed, in line with what was claimed by the State and ERSE, ruled that the actions brought by the wind producers regarding the guaranteed limits in the application of the energy purchase tariffs provided for in Decree Law no. 35/2013, of 28 February were totally unfounded and, as a result, acquitted the defendants, including the State and ERSE.

The producers believed they were entitled, from 2020, to the guaranteed limits of 74 euros and 98 euros per MWh (reference values), and claimed that a change in the remuneration regime was being made, in violation of the contract and the provisions of the Decree Law, a claim that has now been rejected by the judgement of the Braga Administrative Court.

The Court held that, as implemented by the contested public instruments, the values indicated by Decree Law no. 35/2013 of 28 February "*are only reference values*" as a starting point, since they needed to be revised (between 2013 and 2020) using the formula set out in the law itself.

The interpretation of Decree Law no. 35/2013, of 28 February operated through those public instruments and accepted by the Court, starting from the reference values of 74 and 98 euros per MWh, established lower minimum and maximum limits of 67.31 and 89.13 euros per MWh, as of January 2020, and 66.03 and 87.44 euros per MWh, as of 2021. The latter values are updated annually until the end of the term (usually seven years) in line with the inflation rate

NETWORK ACCESS TARIFF PRICES

The network access tariffs in force in 2023²⁹ recorded an average tariff decrease of 288.7% compared to 2022 for the demand forecast for that year, as shown in Table 3-7 .

The average price of the Network Access tariff between 2022 and 2023 is fundamentally driven by the decrease in the Global Use of the System tariff due to the reduction in CIEG. This negative figure is justified by the negative values of the PPA cost differential and the PRE cost differentials passed on to consumers in

²⁹ [Directive 3/2023](#) of 11 January, which approved tariffs and prices for electricity and other services in 2023. [Directive 14/2023](#) of 26 July approved the exceptional setting of tariffs, which came into force on 1 July 2023.

2023, including the renewable PRE cost differential, the revenue obtained from the taxation of oil and energy products (ISP), the auctions of greenhouse gas emission licences, the product of the extraordinary contribution on the energy sector (CESE) and the extraordinary allocation of funds from the Environmental Fund to the Electricity Energy System.

It should be noted that in July 2023, ERSE set exceptional tariffs, so the following table reflects the average value of the approved network access tariffs in force from January to June and July to December 2023.

Table 3-7 – 2023 Electricity network access tariffs

	2022 Tariffs (average prices) €/kWh*	2023 Tariffs (average prices) €/kWh	Change
Network Access Tariffs	0.01264	-0.02386	-2.88723
Access to EHV Networks	-0.00766	-0.03254	3.24811
Access to HV Networks	-0.00762	-0.02826	2.70843
Access to MV Networks	-0.00596	-0.01716	1.87884
Access to SpLV Networks	0.02280	-0.00172	-1.07554
Access to StLV Networks	0.03594	-0.03043	-1.84682

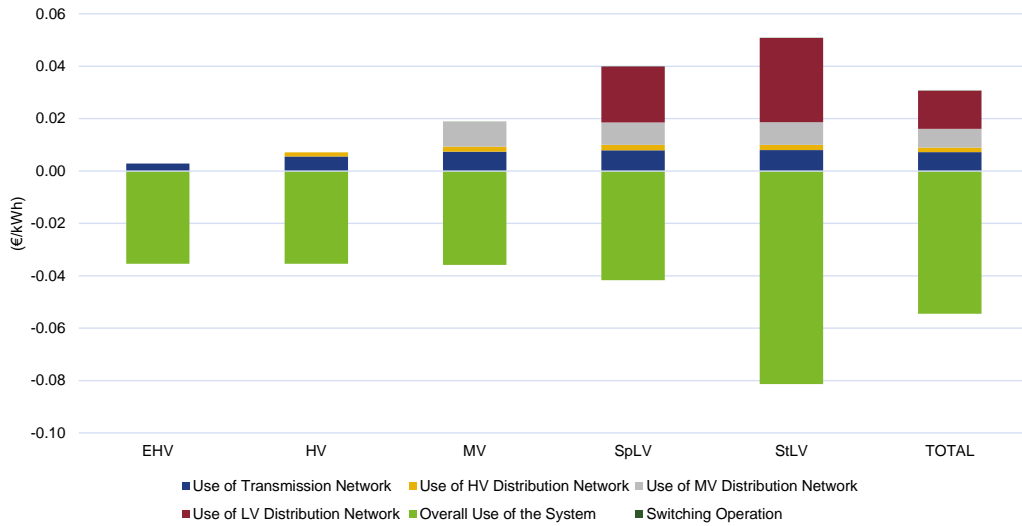
* Application of 2022 tariffs to the demand forecasted for 2023.

Source: ERSE Data. Note: The analysis includes the effect of extraordinary tariff settings in July 2022 and July 2023, on the tariff prices for 2022 and 2023.

The exceptional revision of tariffs in 2023 was essential to ensure greater tariff stability in the context of high volatility in energy markets and abnormally high prices in wholesale electricity and natural gas markets. The exceptional setting of tariffs was aimed at bringing the Energy tariff and Network Access tariffs into line with market conditions. The decrease in Network Access tariffs was fundamentally due to the reduction in the Global Use of the System tariff as a result of the decrease in CIEG associated with electricity production, given that the benefit for Network Access tariffs was lower than initially estimated for 2023. The smaller decrease in Network Access tariffs was balanced by the reduction in the Energy tariff, resulting in a nil effect on the tariffs for LV consumers.

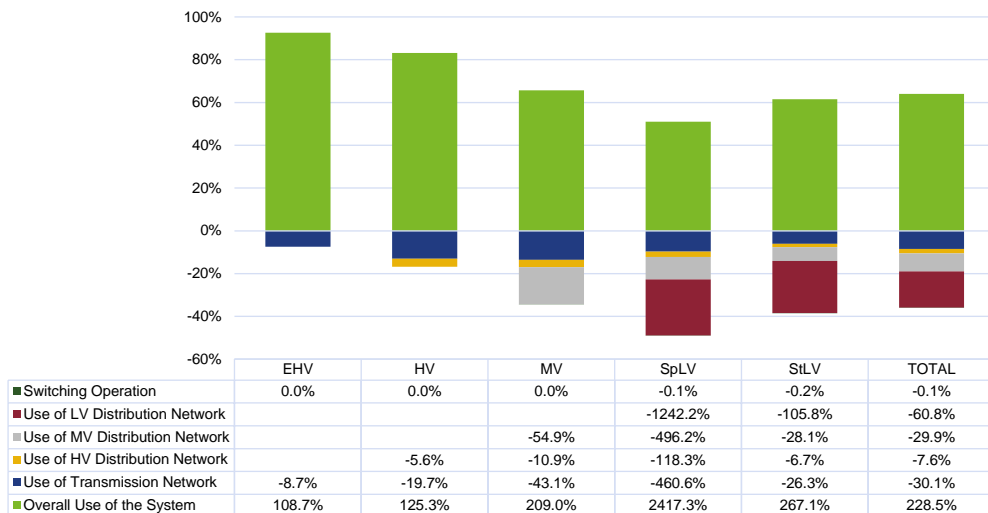
Figure 3-15 below shows the breakdown of average prices for the 2023 electricity network access tariffs per regulated activity and voltage level, while Figure 3-16 shows the corresponding structure of average prices per regulated activity and voltage level³⁰.

Figure 3-15 – Breakdown per activity of the average price of electricity network access tariffs in 2023



Source: ERSE Data

Figure 3-16 – Structure of the average price of electricity network access tariffs by regulated activity per voltage level in 2023



³⁰ The value of the OLMC tariff is not visible in the graphic, although it is applicable.

Source: ERSE Data

REGULATORY DEVELOPMENTS

REVISION OF ERSE'S ELECTRICITY TARIFFS CODE

On 28 March 2023, ERSE launched [Public Consultation No. 113](#) with the proposal to reformulate the electricity sector's Tariffs Code (RT), on which the revenues and tariffs for 2024 will be based.

In terms of the tariff structure, the main changes envisaged the implementation of the legal provisions laid down in Decree Law 15/2022 of 14 January and the introduction of the necessary improvements. In this context, it is worth highlighting:

- the introduction of the reference tariff, applicable to electricity producers supplying on the market, including the surplus energy produced by self-consumers, who are represented on the market by the aggregator of last resort;
- the elimination of the Switching Logistics Operation tariff and its replacement by a regulated price;
- approval of the CIEG pass-through methodology;
- changes to the network access tariffs applicable to autonomous storage facilities, facilities with the status of electro-intensive customer, for consumption and for self-consumption, and to electric mobility.

REGULATORY METHODOLOGIES FOR DETERMINING ALLOWED REVENUES

2023 was the second year of the 2022-2025 regulatory period. The regulatory models used in this period to calculate allowed revenues are summarised below, by type of network operator and for suppliers of last resort.

- For mainland Portugal:
 - Transmission system operator (TSO) – For electricity transmission activities, revenues are determined by a regulatory methodology based on revenue cap³¹ type incentives applied

³¹ The cost drivers are the network length (km) and the connected power for producers.

to TOTEX³², complemented by a profit and loss sharing mechanism and a component of non-controllable costs. This element of non-controllable costs should be analysed and calculated on an annual basis, on a case-by-case basis, and should only be considered when justified. An incentive to improve the technical performance of the RNT is also applied. This incentive aims to encourage the network operator to improve its technical performance, taking into consideration the following indicators: (i) "maintaining the availability of RNT equipment" indicator; (ii) "maintaining the technical quality of service of the RNT" indicator; and (iii) "the level of interconnection capacity made available to the markets" indicator.

- For global technical management system activities (system operation), revenue is determined on the basis of a revenue cap methodology, with a separation of controllable and non-controllable costs for the purpose of applying efficiency targets.
- Distribution network operator (DSO) – At HV and MV, a revenue cap³³ methodology is applied to TOTEX. In LV, the application of a revenue cap³⁴ methodology to TOTEX (total costs) of the LV electricity distribution activity has been maintained. Other incentives are also applied: (i) incentive to reduce losses in distribution networks; (ii) incentive to improve continuity of service; and (iii) incentive to integrate LV facilities into smart grids. In addition, a component of non-controllable costs is added. This component of non-controllable costs should be analysed and calculated annually on a case-by-case basis and should only be considered if justified and complemented by a profit and loss sharing mechanism.
- Supplier switching operator³⁵ - Incentive regulation methodology applied to TOTEX, evolving with the application of an IPIB-X³⁶ methodology.

³² Total Expenditure.

³³ Cost drivers for HV/MV are the network extension (km) and the power connected for producers.

³⁴ Cost driver for LV is the average number of customers connected in LV.

³⁵ Entity that manages the process of changing electricity and natural gas suppliers.

³⁶ GDP Price Deflator

- Suppliers of Last Resort – The methodology applied to the supply activity was adapted to the new reality of the company. In this context, a price cap type regulation methodology was applied to OPEX^{37 38} and a rate of return methodology was applied to CAPEX³⁹.
- For the Autonomous Regions of the Azores and Madeira, incentive regulation is applied for transmission and distribution activities – (i) for electricity acquisition and system management a revenue cap methodology; (ii) for electricity distribution and supply a price cap methodology is applied to OPEX and accepted costs on an annual basis in the case of CAPEX; (iii) definition of reference costs for fuels (fuel oil, diesel and natural gas) consumed in the production of electricity, as well as for costs arising from the unloading and storage of those fuels⁴⁰; and (iv) an incentive for the integration of LV facilities in smart grids.

The annual efficiency factors applied in mainland Portugal were (i) 1.5% for the TOTEX of the transmission activity; (ii) 1.5% for the TOTEX of the global technical management of the system activity; (iii) 0.75% for the TOTEX of the distribution activity; (iv) 0% in the case of OLMC; and (v) 0.75% for the OPEX of the supplier of last resort activity.

The efficiency targets applied to the OPEX of the regulated activities of the Autonomous Regions of the Azores and Madeira were as follows: (i) RAA: 1.5% in the power acquisition and system management activity, 2.5% in the distribution activity and 3% in the supply activity; (ii) RAM: 1.5% in the power acquisition and system management activity, 2% in the distribution activity and 2.5% in the supply activity.

For the supplier of last resort activity, the reference costs are determined annually in order to comply with the legal framework and with the objective of creating a sustained base for defining the unit OPEX of this activity.

Regarding capital costs⁴¹, a partial indexation methodology is applied to the yields of treasury bonds (OT), which allows the reflection of the evolution of the economic-financial situation and, thus, the compensation for the risks of the equity or the borrowed capital.

³⁷ Operational Expenditure.

³⁸ Cost driver is the number of customers.

³⁹ Capital Expenditure.

⁴⁰ Electricity generation in the Autonomous Regions of the Azores and Madeira is regulated, and is not liberalised because these regions have benefited from a derogation of the application of Directive 2003/54/EC.

⁴¹ Rates of return on assets for 2023 in mainland Portugal and autonomous regions – transmission: 4.75%; distribution: 5.05%.

The allowed revenues for transmission and distribution network operators of mainland Portugal include costs arising essentially from legislative decisions, the so-called General Economic Interest Costs (CIEGs). Those costs are included in the TSO's global technical management system activity and in the so-called "sale and purchase of the access of transmission network" activity of the DSO. The most significant CIEGs, in terms of their value and their impact on market functioning, are related to electricity generation, as is explained below.

Market liberalisation resulted in a need to anticipate the termination of the long-term Power Purchase Agreements (CAE). Two of these contracts were maintained, with the energy produced by these two power plants being managed by a trading company, although fully regulated (Commercial Agent, as established in ERSE's Commercial Relations Code, RRC). Until 2021, this company's revenue depended on incentives set by ERSE. Therefore, these incentives directly related the allowed revenues of the trading company to the mark-up. One of these PPA ended in 2021, so there is now only one PPA that will end in 2024. By legal imposition, since 2022 ERSE has not applied the incentive and the allowed revenues of the trading company correspond to its operating costs.

The remaining power purchase agreements were terminated at the time of liberalisation, in 2007, and the respective power plants were included in a legal concept - Costs for the Maintenance of Contractual Equilibrium (CMEC) - which gives producers the right to receive compensation intended to grant them equivalent economic results as those provided by the PPA. This regime, as indicated in past reports, ended in 2017. The effects resulting from the final adjustment required by law will last 10 years from 2018.

In addition to those costs, there are other more significant costs related to: i) the remuneration of energy generated by renewable resources or cogeneration (except for large hydropower plants), which are determined administratively; ii) the concession of rents paid by the distribution network operator in LV to municipalities; and iii) compensation paid to the companies of the Autonomous Regions of Madeira and the Azores via the application, in these regions, of a tariff level equal to that of mainland Portugal.

In 2023, the total value of the CIEG in was negative. This was due to a reduction, in that year, in the surcharge associated with generation with guaranteed remuneration, which reached negative values as a result of the price of electricity on the wholesale market being higher than the average cost of purchasing

from generators with guaranteed remuneration⁴². Consequently, this portion of the CIEG in 2023 represented an amount to be deducted from the tariffs.

NETWORK CONNECTION CHARGES

The connection of a facility to the electricity network entails costs that depend on the facility to be connected (voltage level, technical requirements), the network itself (aerial, underground, meshed, radial), the type of connection (aerial, underground), and the distance from the facility to the existing network and surrounding ones (route).

The regulatory framework that applies to electricity network connections, which includes the applicable rules and respective charges, is set out in ERSE's RRC⁴³, approved by ERSE. In 2023, following the regulatory review carried out through [Public Consultation No. 113](#), some network connection issues were reviewed. Highlights of the review include the introduction of rules on private distribution networks; the regulation of commercial conditions for network connections to autonomous storage facilities, bringing their regime into line with that of energy production facilities; improvements to the commercial conditions applicable to UPACs (self-consumption production units) and the regulation of third party access networks with restrictions. The sub-regulation of commercial conditions for third party access to networks (e.g. definition of parameters, maximum dimensions and prices) is due to be revised in 2024.

The established commercial conditions (which also encompass mandatory third party access, the ownership and construction of the network connection elements, the type of charges that can be levied on petitioners and the obligation by the relevant parties to provide information) include incentives for an adequate economic signalling of the costs of the facility to be connected to the network, promote an efficient allocation of resources and are based on simple and easy to apply rules in order to ensure their understanding and reduce the level of conflicts in the sector.

Networks are paid by petitioners through network connection charges (according to the rules approved by ERSE) and by final consumers through tariffs for use of the network, which form part of the electricity bill

⁴² The most crucial component of the CIEG is the remuneration guarantees for producers, particularly those with renewable energy sources. These guarantees operate in a manner analogous to contracts for difference, which reference electricity prices on the wholesale market. In the event of rising prices on the wholesale market, the value of these CIEGs declines, and vice versa.

⁴³ [Regulamento no. 827/2023, de 28 de julho.](#)

(the difference between the investment cost and the cost directly attributed to the petitioner through connection charges is borne by all users, through tariffs for use of the network).

3.1.3 INTERCONNECTION MANAGEMENT, CROSS-BORDER BALANCING ACTIONS AND MARKET COUPLING

In 2023, there were no significant changes in the management of interconnections between Portugal and Spain, namely in the model for allocating capacity, which is allocated exclusively to the MIBEL daily and intraday markets. In addition, financial mechanisms were in place to cover the risk of price separation in the Iberian markets due to interconnection congestion. The resolution of congestion is based on the application of a market splitting mechanism⁴⁴.

It should be recalled that MIBEL began operating officially on 1 July 2007, based on a single daily market that sustains the mechanism for joint management of the Portugal–Spain interconnection, with the latter being regulated by the rules and principles defined in the following legal/regulatory instruments: Regulation (EC) No. 714/2009⁴⁵; ERSE Code on Access to Networks and Interconnections⁴⁶; ERSE Manual of Procedures for the Joint Management Mechanism of the Portugal-Spain Interconnection⁴⁷; and ERSE Manual of Procedures for Global Technical Management System of the electricity sector⁴⁸.

In 2023, work continued on implementation of the terms and conditions or methodologies foreseen in:

⁴⁴ The mechanism for the auction of cross-border interconnection capacity (between the so-called *bidding zones*) is implicit in the offers that the agents place on the daily market and assumes the existence of a single market managed by a single market operator. When the cross-border interconnection capacity is higher than the transit of energy arising from the closing of the market, the interconnection does not get congested and there is only one market price for the two bidding zones. On the other hand, when the interconnection capacity is lower than the transit of energy arising from the closing of the market, the interconnection gets congested at its limit and the markets offer different prices - higher on the importing market and lower on the exporting market.

⁴⁵ This Regulation was replaced by Regulation (EU) 2019/943 of 5 June 2019 of the Parliament and of the Council <https://eur-lex.europa.eu/legal-content/PT/TXT/PDF/?uri=CELEX:32019R0943&from=en>

⁴⁶ The [Access to Networks and Interconnections Code](#) (RARI) was approved by ERSE Regulation no. 560/2014 of 22 December, later amended by ERSE Regulation no 620/2017, published in *Diário da República*, 2.^a série, of 18 December.

⁴⁷ The [Manual of Procedures for the Joint Management Mechanism of the Portugal-Spain Interconnection](#) was approved by ERSE Directive no. 10/2018, published in *Diário da República*, 2.^a série of 10 July, with the amendments introduced by ERSE Directive no. 1/2019, published in *Diário da República*, 2.^a série of 7 January.

⁴⁸ [Manual of Procedures for Global Technical System Management of the Electricity System](#) was approved by Directive 23/2022 of 13 December.

- Commission Regulation (EU) 2016/1719 of 26 September, establishing a guideline on forward capacity allocation (FCA GL);
- Commission Regulation (EU) 2015/1222 of 24 July, establishing a guideline on capacity allocation and congestion management (CACM GL), including those related to the capacity calculation regions defined by ACER Decision No. 6/2016, of 17 November, namely the Capacity Calculation Region South-west Europe (CCR SWE) that includes the interconnections of Portugal, Spain and France;
- Commission Regulation (EU) 2017/2195 of 23 November, establishing the guidelines on balancing of electricity system (EB GL)
- Regulation (EU) 2019/943 of 5 June, on the internal market of electricity.

The implementation of these standards will have a direct influence on the mechanisms for capacity allocation and congestion management in the interconnections.

REVENUE FROM CONGESTION ON INTERCONNECTIONS

According to European legislation and regulation⁴⁹, congestion revenue may only be used to: 1) to compensate for costs incurred in guaranteeing the effective availability of the allocated interconnection capacity; 2) invest in reinforcement or maintenance of interconnection capacity; or 3) reduce the transmission network tariff, if the revenue is not used for the two aforementioned purposes.

In 2023, the congestion revenue on interconnections between Portugal and Spain, resulting from the difference between zonal prices after the application of market splitting, reached a total of 29.56 million euros, a value above the amount registered in 2022 (9.63 million euros). This rise is explained both by the doubling of congested hours (+85%) and by a staggering increase of the spread in those.

In Portugal, the congestion revenue in 2023 had two main uses: i) coverage of costs related to balancing coordinated actions, foreseen in the Manual of Procedures for the Joint Management Mechanism of the Portugal-Spain Interconnection⁵⁰; and ii) compensation of the settlement of the risk of price differentials (value to be returned to the market agents due to the occurrence of market splitting), taking into account

⁴⁹ Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June on the internal market in electricity

⁵⁰ [Manual of Procedures for the Joint Management Mechanism of the Portugal-Spain Interconnection](#)

the previously acquired rights of use. As the revenue from congestion rents has contributed, as far as possible and applicable, to achieving the priority objectives defined in the European Regulation, and as there are no other costs related to investments with a significant contribution to maintaining or increasing interconnection capacity, the remaining amount of this revenue will revert to the calculation of the transmission network use tariff.

Table 3-8 shows the monthly evolution of the main variables that reflect the use of the interconnection, namely the number of congestion and market splitting hours, and the respective price in each market, as well as the arithmetical price differential. The table also shows the monthly evolution of the congestion revenue and the energy associated with each of the interconnection directions.

Table 3-8 – Monthly evolution of congestion revenue, 2023

Month	Congestion		Average Price PT	Average Price ES	Price differential	Import (PT <-- ES)	Export (PT --> ES)	Congestion revenue
	no. hours	% hours/month	(€/MWh)	(€/MWh)	(€/MWh)	(MWh)	(MWh)	10 ³ €
January	20	3%	69.35	69.55	-0.20	308 159	477 899	409
February	23	3%	134.23	133.47	0.76	404 752	621 938	2 877
March	27	4%	90.05	89.70	0.35	1 360 330	40 565	809
April	83	12%	76.96	73.73	3.23	1 371 303	20 153	5 876
May	38	5%	76.09	74.21	1.88	1 304 162	16 419	1 909
June	77	11%	95.59	93.02	2.56	1 021 021	78 453	4 539
July	71	10%	93.80	90.47	3.33	1 024 342	57 691	6 171
August	44	6%	97.86	96.05	1.81	1 110 200	46 744	3 091
September	31	4%	104.15	103.34	0.81	1 158 201	63 640	2 305
October	18	2%	89.74	90.03	-0.29	828 466	252 728	969
November	7	1%	63.26	63.45	-0.19	349 422	471 881	320
December	25	3%	72.20	72.17	0.03	909 598	217 266	281
TOTAL	464	5%	88.61	87.43	1.17	11 149 955	2 365 376	29 556

Source: OMIE⁵¹ data

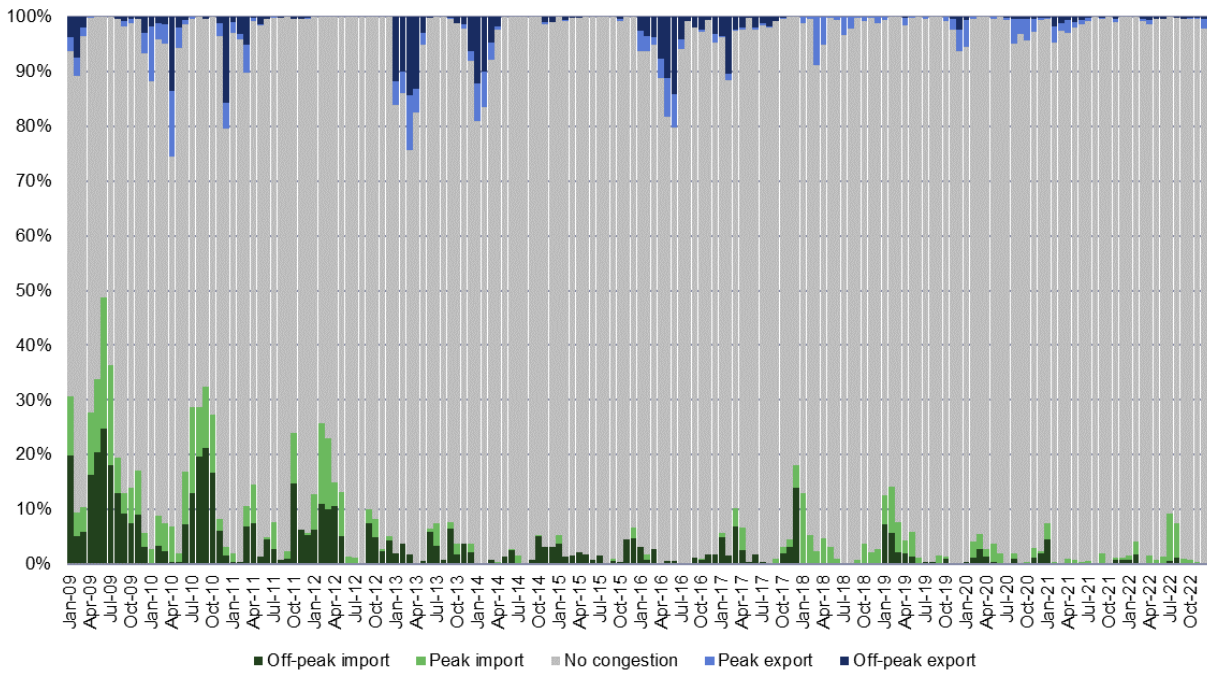
⁵¹ Operador del Mercado Ibérico de Energía – Spanish hub.

When comparing the total number of congestion hours, the variation was 213 hours (251 hours in 2022 to 464 hours in 2023, in both directions of the interconnection) continuing to reflect strong market integration.

In terms of the price differential, in 2023, there was a positive average spread of 1.17 €/MWh, in the import direction, a value above the figures for 2022 (also import spread of 0.37 €/MWh). In some months, there was an inversion of the direction of congestion, following differences in generation mix, mostly in months with a high share of hydropower generation.

Figure 3-17 shows the use of the available capacity in both directions of the Portugal-Spain interconnection, from 2009 to 2023. The figure shows the reduced number of congestion hours verified in recent years. Also to be noticed is an increase in off-peak transit hours in the import direction during periods of high solar generation in Spain.

Figure 3-17 – Usage of the Portugal-Spain interconnection capacity, 2009 to 2023



Source: REN and OMIE data

COOPERATION

ERSE cooperates regularly with the other European regulators in the context of CEER and ACER, pursuing the internal energy market.

The Iberian market is currently coupled with the *North-West* Europe (NWE) region, which includes the markets of France, Belgium, Netherlands, Germany, Luxembourg, United Kingdom, Norway, Denmark, Sweden and Finland).

Given Portugal's geographic location, ERSE cooperates closely with the Spanish regulator, through the MIBEL Council of Regulators, namely in terms of the coordinated management of the Portugal-Spain interconnection. Similarly, ERSE cooperates closely with Spain and France, in terms of the work inherent to the Capacity Calculation Region of South West Europe (CCR SWE), work is underway with a view to the successful European integration of the Iberian Electricity Market.

APPROVAL OF THE AMENDMENT OF THE COMMON METHODOLOGY FOR CAPACITY CALCULATION IN THE SOUTH WEST EUROPEAN CALCULATION REGION

Upon a proposal from the Portuguese TSO, in coordination with other TSOs of the Southwest region (SWE), and subsequent analysis of the proposal, on 12 July the SWE regulators approved the Terms of Reference of the "Agreement by the South West Europe Regulatory Authorities at the South West Europe Energy Regulators' Regional Forum on South-West Europe TSOs methodology for cross-zonal capacity calculation within the balancing timeframe for the exchange of balancing energy or for operating the imbalance netting process in accordance with Article 37 of Commission Regulation (EU) 2017/2195 of 23 November 2017, 12.06.2023". Under this agreement, the respective methodology was approved.

FORWARD TRADING OF THE COMMERCIAL CAPACITY ON THE PORTUGAL-SPAIN INTERCONNECTION

The process for the harmonised allocation of financial transmission rights (FTR) concerning capacity on the Portugal-Spain interconnection (IPE) proceeded smoothly in 2023. This results from the work to integrate the Portugal-Spain interconnection into a harmonised and coordinated referential for the forward allocation of commercial capacity, carried out within the framework of the MIBEL Council of Regulators and of the South West Europe region.

As stated in last year's report, in the framework of the early implementation of Commission Regulation (EU) 2016/1719 of 26 September 2016 establishing a guideline on forward capacity allocation (FCA GL), ERSE approved in November 2016, the Harmonised Allocation Rules (HAR) for European electricity interconnections, as well as the respective annex with the specificities relating to the Portugal-Spain interconnection.

At the end of 2017, following the proposal of all TSOs, in accordance with Article 51 of Regulation (EU) 2016/1719, ACER published its Decision No 3/2017, of 2 October on harmonised allocation rules for long-term transmission rights in the European Union.

According to Article 38(2) of Regulation (EU) 2016/1719, the allocation of forward interconnection capacity should be carried out through a single European allocation platform. These functions were delegated by the TSOs to the *Joint Allocation Officer* (JAO). The migration process to this platform was completed in December 2018.

During the December 2018 auction, contracts with annual, quarterly and monthly maturities and 2019 delivery were placed in line with the harmonised allocation rules for long-term transmission rights in the European Union, set out in Article 52 of Regulation (EU) 2016/1719, including the annex on capacity calculation methodology in the Southwest (CCR SWE).

This annex establishes orientations, approved by ERSE and CNMC, on the structure for the allocation of capacity among different timeframes for the Portuguese-Spanish interconnection (*Structure for the allocation of capacity among different timeframes for Portuguese – Spanish Interconnection - IPE Splitting Rules*).

Following the publication of these harmonised capacity allocation and splitting rules in the Portuguese-Spanish interconnection, ERSE amended the Manual of Procedures for the Joint Management Mechanism of the Portugal-Spain Interconnection, provided for in the ERSE Network Access Code, through ERSE Directive 1/2019, of 7 January.

Between December 2022 and November 2023, the financial transmission rights (FTR) auctions of commercial capacity on the Portugal-Spain interconnection with 2023 delivery took place at the joint allocation platform, as shown by Table 3-9.

Table 3-9 – Financial transmission rights auctions of commercial capacity on the Portugal-Spain interconnection with 2023 delivery

Contract	Maturity	Date	Premium (€/MWh)	Volume (MW)	Participants	Participants with allocated capacity
ES-PT YR	Yearly	09/12/22	0.35	510	26	14
PT-ES YR	Yearly	09/12/22	0.20	460	23	16
ES-PT Q1	Quarterly	16/12/22	0.23	510	14	9
PT-ES Q1	Quarterly	16/12/22	0.18	530	14	8
ES-PT M1	Monthly	22/12/22	0.21	590	28	16
PT-ES M1	Monthly	22/12/22	0.26	310	27	11
ES-PT M2	Monthly	24/01/23	0.26	280	25	10
PT-ES M2	Monthly	24/01/23	0.18	830	24	16
ES-PT M3	Monthly	22/02/23	0.18	440	26	12
PT-ES M3	Monthly	22/02/23	0.11	1180	25	21
ES-PT Q2	Quarterly	09/03/23	0.09	670	11	10
PT-ES Q2	Quarterly	09/03/23	0.13	320	9	7
ES-PT M4	Monthly	23/03/23	0.00	0	1	0
PT-ES M4	Monthly	23/03/23	0.08	1170	26	21
ES-PT M5	Monthly	25/04/23	2.21	10	26	3
PT-ES M5	Monthly	25/04/23	0.13	650	25	8
ES-PT M6	Monthly	24/05/23	1.22	640	31	16
PT-ES M6	Monthly	24/05/23	0.12	600	24	9
ES-PT Q3	Quarterly	08/06/23	1.50	510	20	12
PT-ES Q3	Quarterly	08/06/23	0.13	410	11	5
ES-PT M7	Monthly	22/06/23	1.22	1020	32	21
PT-ES M7	Monthly	22/06/23	0.15	370	26	9
ES-PT M8	Monthly	25/07/23	1.77	740	33	27
PT-ES M8	Monthly	25/07/23	0.00	0	2	0
ES-PT M9	Monthly	23/08/23	1.72	1170	40	23
PT-ES M9	Monthly	23/08/23	0.16	700	28	9
ES-PT Q4	Quarterly	08/09/23	0.58	360	16	8
PT-ES Q4	Quarterly	08/09/23	0.21	580	14	6
ES-PT M10	Monthly	22/09/23	0.36	1080	32	18
PT-ES M10	Monthly	22/09/23	0.16	250	26	11
ES-PT M11	Monthly	24/10/23	0.41	890	31	11
PT-ES M11	Monthly	24/10/23	0.40	720	31	9
ES-PT M12	Monthly	22/11/23	0.30	1020	29	15
PT-ES M12	Monthly	22/11/23	0.41	850	28	11

Source: JAO data, ERSE elaboration

Table 3-10 presents the settlement of annual FTR auctions with 2023 delivery on the Portugal-Spain interconnection.

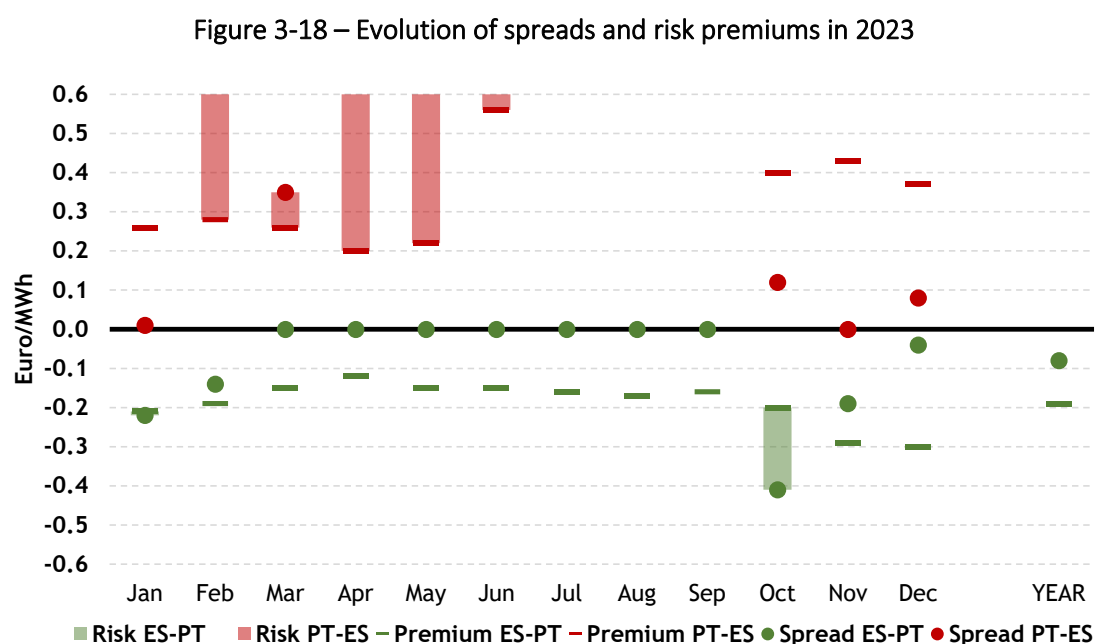
Table 3-10 – Annual FTR settlement with 2023 delivery

Annual FTR settlement	GLOBAL	Pr ES > Pr PT	Pr PT > Pr ES
		FTR E-P	FTR P-E
Capacity (MW)	1 552 + 1 681	1552	1681
Energy (MWh)	13 593 583 + 14 727 974	13 593 583	14 727 974
Premium (€/MWh)	----	0,19	0,61
Spread (€/MWh)	----	0,08	1,26
Spot congestion (euros)	29 555 607	1 799 696	27 755 911
FTR risk (euros)	19 002 872	1 073 755	17 929 118
FTR actions premium (euros)	11 551 851	2 545 709	9 006 142
Net FTR auctions (euros)	-7 451 021	1 471 955	-8 922 976
Spot congestion + Net FTR (euros)	22 104 586	3 271 651	18 832 935
FTR - Financial Transmission Rights			

Source: JAO, REN and OMIE data, ERSE elaboration

It can be seen that during 2023, in the direction Portugal-Spain, there was a risk premium⁵² of 0.19 €/MWh and a spread⁵³ of 0.08 €/Wh. In the direction Spain-Portugal, there was a risk premium of 0.61 €/MWh and a spread of 1.26 €/MWh.

Figure 3-18 shows the evolution of spreads and risk premiums in 2023.



Source: JAO, REN and OMIE data, ERSE elaboration

Considering these results, the FTR capacity auctions on the Portugal-Spain interconnection with 2023 delivery yielded approximately 7.45 million euros, resulting in a net loss for the system.

PORTUGAL-SPAIN INTERCONNECTION ANALYSIS AND MONITORING OF COMPLIANCE WITH THE MINIMUM LEVEL OF MARGIN AVAILABLE FOR CROSS-ZONAL TRADE IN 2022

Article 16(8) of Regulation (EU) 2019/943, of 5 June, on the internal electricity market, establishes the minimum values of interconnection capacity to be made available by TSOs for cross-zonal trade:

⁵² The risk premium is defined as the premium weighted by placed product in the financial transmission rights auctions of commercial capacity on the Portugal-Spain interconnection with 2022 delivery.

⁵³ The spread is defined as the average price difference between the Portuguese and Spanish zones in the OMIE daily market considering the applicable power flow direction (different figures for import or export).

“8. Transmission system operators shall not limit the amount of interconnection capacity to be made available to market participants to resolve congestion within their own bidding zones, or as a means of managing flows resulting from internal transactions to bidding zones. Without prejudice to the application of the derogations pursuant to paragraphs 3 and 9 of this article and in application of article 15, paragraph 2, the provisions of this paragraph shall be considered fulfilled if the following minimum levels of capacity are reached available for cross-zone trade:

a) For borders using an approach based on coordinated net transport capacity, the minimum capacity will be 70% of the transport capacity, respecting the operational safety limits after deduction of emergencies, as determined under the guidance on the allocation of capacity and congestion management, adopted on the basis of Article 18(5) of Regulation (EC) No 714/2009;”

Article 59(1)(h) of Directive (EU) 2019/944 states that the NRA of each Member State has the responsibility of "ensuring that transmission system operators make available interconnector capacities to the utmost extent pursuant to Article 16 of Regulation (EU) 2019/943".

In this regard, in July 2023, ERSE published⁵⁴ a report on the "Analysis of the Portugal-Spain interconnection capacity and monitoring of compliance with the minimum level of margin available for cross-zonal trade in 2022". With this report, ERSE intended, on the one hand, to assess the evolution and current status of the interconnection capacity between Portugal and Spain and, on the other hand, to assess the degree of compliance with the minimum levels set out in Article 16(8) of Regulation (EU) 2019/943.

In general, it was concluded that the minimum levels have been complied with in 79.4% of the situations in which it was possible to carry out the evaluation. Broken down by direction, it was found that, in the export direction (from Portugal to Spain), the minimum levels were complied with in 74.1% of the situations which it was possible to assess and that, in the import direction (from Spain to Portugal), the minimum levels were complied with in 84.6% of the situations which it was possible to assess.

⁵⁴ <https://www.erse.pt/atividade/regulamentos-eletricidade/acesso-as-redes-e-as-interligacoes/relatorios-maczt-e-pedidos-de-derrogacao/>

APPROVAL OF THE DEROGATION REQUEST TO APPLICATION IN 2024 OF ARTICLE 16(8) OF REGULATION (EU) 2019/943 ON THE MINIMUM LEVEL OF MARGIN AVAILABLE FOR CROSS-ZONAL TRADE

Article 16(9) of Regulation (EU) 2019/943 allows regulatory authorities to grant a derogation from the requirement set out in paragraph 8 of the same article, in relation to the minimum 70% interconnection capacity offered, upon request of TSOs.

On 1 November 2023, REN sent ERSE its “request for derogation on the implementation of the minimum margin available for cross-zonal trade in accordance with Article 16(9) of Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the internal market for electricity (recast), November 2023”. REN requested a one-year derogation, for 2024, on the obligation of network operators to make available at least 70% of the transport capacity for inter-zonal trade, respecting the operational safety limits after deduction of emergencies.

After a technical evaluation of the request for a derogation sent by REN, ERSE approved⁵⁵ the derogation requested by REN.

COMMON EUROPEAN PLATFORMS FOR THE IMBALANCE NETTING PROCESS AND FOR THE EXCHANGE, BETWEEN TSOs, OF BALANCING ENERGY FROM THE RESERVES ESTABLISHED IN COMMISSION REGULATION (EU) 2017/2195

Following the publication of Commission Regulation (EU) 2017/2195 establishing a guideline on electricity balancing (EB GL), common European platforms were established for imbalance netting (IN) and for the exchange of balancing energy from frequency restoration reserves with automatic activation (aFRR) and with manual activation (mFRR)); and from replacement reserves (RR), aiming to integrate the balancing markets.

The TERRE project, started in 2013, is a voluntary pilot project that results from the early implementation initiatives of the Balancing Network Code, to which Regulation (EU) 2017/2195 referred to above gave substance. The platform for the exchange of balancing energy from replacement reserves (LIBRA), which implemented the TERRE project, began operating in January 2020 with the Czech TSO (CEPS). In early March 2020, the Spanish TSO (REE) started using the platform, followed by the Portuguese TSO (REN - Rede

⁵⁵ <http://www.erse.pt/atividade/regulamentos-eletricidade/acesso-as-redes-e-as-interligacoes/relatorios-maczt-e-pedidos-de-derrogacao/>

Elétrica Nacional) on 29 September, the Swiss TSO (Swissgrid), on 8 October, the French TSO (RTE) on 2 December 2020 and finally the Italian TSO (TERNA) on 13 January 2021.

Table 3-11 shows the energy values and weighted average prices in 2023 of replacement reserves (RR) traded within TERRE in each direction. Regarding Portugal, the table also shows the same information as regards bids, activated bids and the respective weighted average price, as well as the energy in the interconnection, imported (up) and exported (down).

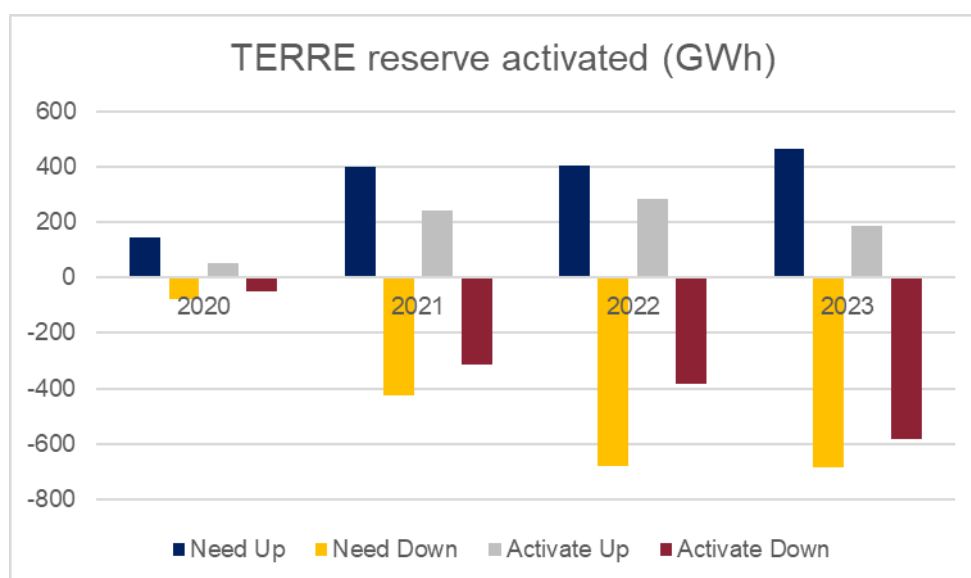
Table 3-11 – Statistics on TERRE, 2023

	Up	Down
Energy (GWh)	468	686
Average Price (€/MWh)	101.78	42.84
PT Bids (GWh)	16 917	9 939
PT Activated Bids (GWh)	186	582
Average PT Price (€/MWh)	87.22	87.88
Interconnection (GWh)	830	652

Source: REN data

The next figure shows the evolution of the replacement reserve activated on the TERRE platform between 2020 and 2023, in GWh, as regards the needs declared by REN and the answer from market agents in Portugal.

Figure 3-19 – Replacement reserve activated in TERRE platform from 2020 to 2023



Source: REN data

We recall that on 16 December 2020, REN started using the IGCC platform from the IN process. The annual energy volumes are quite relevant compared to the energy activated nationally on the frequency restoration process with automatic activation.

On 5 October 2022, the European platform MARI, responsible for the mFRR process began operations with the TSOs from Czechia (CEPS) and Germany (TenneT DE, 50Hertz, Amprion and TransnetBW). The Austrian TSO (APG) joined MARI on 20 June 2023.

On 1 June 2022, the European platform PICASSO began operating the aFRR process, with the TSO from Czechia (CEPS) only. On 22 June, the TSOs from Germany (TenneT DE, 50Hertz, Amprion and TransnetBW) and Austria (APG) began to use the platform, followed by the Italian TSO on 19 July 2023.

Due to high prices that occurred in MARI but especially in PICASSO (higher than 7 500 €/MWh) and to the technical difficulties in the implementation, the number of TSOs that are using PICASSO and MARI platforms is quite small. Participation in these platforms is mandatory, although several derogations have been given, until 24 July 2024. In the case of TERRE, mentioned above, the obligation is limited to Member States whose TSOs use RR, previously known as regulation reserve.

In 2023, following the joint work with regulators and TSOs that began in 2019, ACER continued the monitoring initiated in 2022 of several activities such as the implementation of the MARI and PICASSO platforms, the “ISH - Imbalance settlement harmonisation” and the TSO-TSO settlement methodologies (at

the interconnections, excluding the platforms). Additionally, ACER continued the work initiated in 2022, according to EB GL, such as the definition of the methodologies *“Harmonisation of Cross-Zonal Capacity Allocation methodologies”*, *“RCC facilitation for Balancing Capacity procurement”* and *“RCC regional sizing of reserves”*. Following the contribution for the *“Framework Guideline on Demand Response”*, responding to a request from the European Commission as regards the *“Scoping exercise for the development of a network code regarding demand side flexibility, including rules on aggregation, energy storage and demand curtailment”*, ACER followed in 2023 the work of ENTSO-E and EU DSO Entity that will lead to the presentation to ACER of the draft of that *Network Code*.

NOMINATED ELECTRICITY MARKET OPERATOR

Article 4 of Regulation (EU) 2015/1222, which sets out the guidelines for capacity allocation and congestion management, provides that each Member State shall designate one (or more) Nominated Electricity Market Operator (NEMO).

In the Portuguese case, this entity was designated by the Government through the provisions under the Santiago Agreement, established by Resolution 23/2006 from the Parliament, which approved the Agreement between the Portuguese Republic and the Kingdom of Spain for the Constitution of an Iberian Electricity Market (MIBEL), signed in Santiago de Compostela on 1 October 2004.

This agreement establishes OMIE as the designated NEMO responsible for the management of the day-ahead and intraday markets. This decision was reported to ACER in December 2015.

In 2023, there were no developments regarding the designation of OMIE as NEMO.

XBID PROJECT

The XBID project (European cross-border intraday initiative) is a joint initiative between the European energy exchanges and TSOs to create an integrated and continuous intraday market across Europe resulting from the implementation of the target model set out in the CACM GL (EU Regulation N. 2015/1222). As a result of this initiative, the first go-live phase of the XBID project was launched on 13 June 2018.

Currently, this initiative integrates the continuous intraday market in the following countries: Austria, Belgium, Bulgaria, Croatia, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy,

Latvia, Lithuania, Luxembourg, Norway, the Netherlands, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain and Sweden.

The XBID platform was established as a SIDC (Single Intraday Coupling), which allows cross-border trading across Europe. XBID is based on a common IT system with a shared order book, an interconnection capacity management module and a matching module for offers. This means that market agents in a particular bidding zone can establish ongoing transactions with any agent that operates in any other bidding zone that is involved in the project, as long as there is available cross-zonal interconnection capacity for the trade. The solution aims to increase the overall efficiency of the continuous intraday trading.

To implement the new market design, on 11 June 2018, ERSE approved revisions to specific regulations MPGGS and the Manual of Procedures for the Joint Management Mechanism of Portugal-Spain Interconnection.

Under the Commission Regulation (EU) 2015/1222, ACER approved Decision 04/2018, related to the continuous intraday market timeframes, which established the gate opening time at 15h00 CET and the gate closure time at 60 minutes before energy deliveries at the relevant time negotiated in the continuous intraday market.

Seeking to implement the ACER Decision 04/2018, the Iberian TSOs (REN and REE) and the designated Portuguese and Spanish NEMO (OMIE) launched a public consultation regarding the adaptation of the intraday auctions' timetables to better cope with the 15h00 CET continuous intraday market gate opening time. This consultation led to the decision to keep the six intraday auctions with some timetable adaptations. To implement the continuous intraday market 15h00 CET gate opening time, ERSE approved an alert proposed by the Portuguese TSO, aiming to change the timetables considered by the MPGGS.

In 2023, there were no new developments related to the XBID project.

APPROVAL OF THE APPROPRIATE STEPS FOR ESTABLISHING FREQUENCY CONTAINMENT RESERVES WITH LIMITED ENERGY RESERVOIR DURING ALERT STATES

Article 156(10) of Commission Regulation (EU) 2017/1485 of 2 August 2017 laying down guidelines on the operation of electricity transmission systems (SO Regulation) provides that, in the case of the Continental Europe (CE) and Nordic synchronous areas, TSOs shall draw up a proposal for the minimum activation period to be ensured by providers of Frequency Containment Reserves (FCR) with limited energy reservoir (T_{minLER}) during alert states. The specified period shall not exceed 30 minutes and shall not be less than

15 minutes, and the proposal shall take into account the results of a cost-benefit analysis carried out for this purpose in accordance with paragraph 11 of the same article.

On 8 October 2021, REN sent ERSE the proposal "All Continental Europe TSOs' proposal for the definition of a minimum activation time period required for FCR providing units or groups with limited energy reservoirs to remain available during alert state in accordance with Article 156(11) of the Commission Regulation (EU) 2017/1485, Date: 5 October 2021", which was approved by all the European electricity TSOs in the Continental Europe synchronous zone for submission to the respective regulatory authorities, for the purposes of complying with the provisions of Article 156(10) of Regulation (EU) 2017/1485. Article 156(10) of Regulation (EU) 2017/1485.

After a technical assessment of the proposal, all the regulators of the Continental Europe Synchronous Area agreed, on 2 December 2022, on the terms of the request for amendment to the TSOs' proposal - "Request for amendment by the Regulatory Authorities of the Continental Europe Synchronous Area of all Continental Europe TSOs' proposal for the definition of a minimum activation time period required for FCR providing units or groups with limited energy reservoirs to remain available during alert state in accordance with article 156(10) of the Commission Regulation (EU) 2017/1485, 2 December 2022". The regulators' decision considered that TSOs should take into account the result of a proper assessment of the sizing and performance criteria of the Frequency Containment Reserve (FCR) and the Replenishment Reserve (RR) in all power-frequency control (PFC) zones of the synchronous zone and the correlation with the ongoing revision of the FCR sizing criteria with probabilistic assessment.

On 27 March 2023, REN sent ERSE the document "CBA LER - TSOs response to RfA of NRAs - Schedule of activities", which was approved by all the TSOs in the Continental Europe synchronous zone for submission to the respective regulatory authorities, for the purposes of complying with Article 156(10) of Regulation (EU) 2017/1485.

After analysing the document received, the regulatory authorities took the view that this document could not be considered a valid response to the change request made, so Article 5(9) of Regulation (EU) 2017/1485 was applied, and it was up to the NRAs to approve the appropriate steps for establishing the TminLER.

In these terms, on June 26, 2023, the regulatory entities of the Continental Europe synchronous area agreed on the terms of the "Agreement by the Regulatory Authorities of the Continental Europe Synchronous Area on the appropriate steps for the adoption of the definition of a minimum activation time

period required for FCR providing units or groups with limited energy reservoirs to remain available during alert state pursuant to Article 5(9) of the Commission Regulation (EU) 2017/1485, 26 June 2023”, which integrate the tasks and the respective calendar to be fulfilled by the TSOs in order to allow T_{min}LER to be approved.

3.1.4 INVESTMENTS IN ELECTRICITY NETWORKS

In 2023, no investment plans were approved for the transmission network or the distribution network, although the TSO should have submitted a draft investment plan (TYNDP 2024-2033) to ERSE and to DGEG, as legally foreseen under article 126(4) of Decree Law no 15/2022, of 14 of January.

However, under article 124(2) of the same Decree Law, the national TYNDP shall be drawn as sectorial programme Plan, as foreseen in article 39 (2)a of Decree Law no 80/2015, of 14 May, in its current wording.

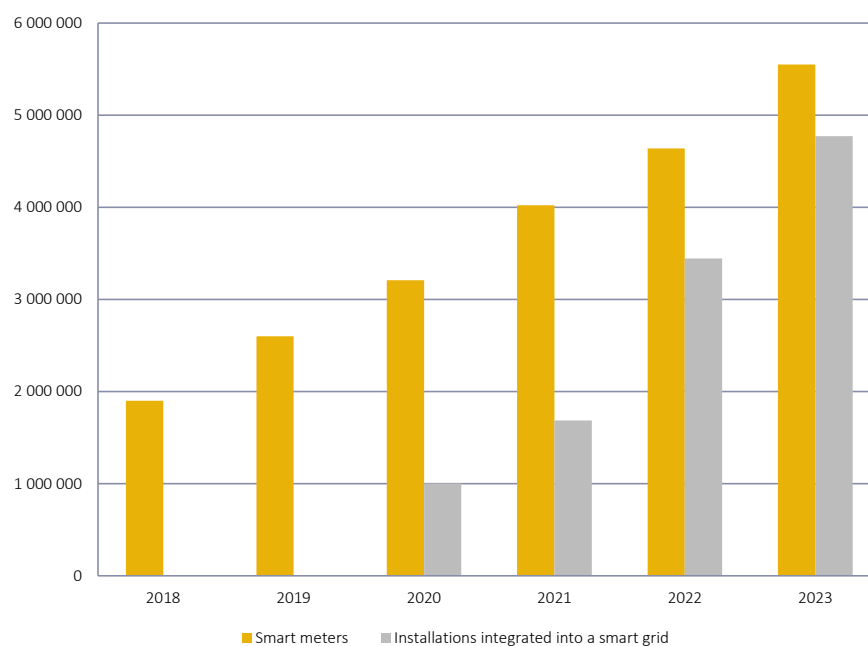
Since the next TYNDP will be the first Investment Plan to be submitted following the entry into force of Decree Law no 15/2022, of 14 of January, on 9 January 2024, the Secretary of State for Energy and Climate issued an order setting each stage for the TSO drawing the TYNDP proposal, also setting the respective schedule for its approval as a sectorial plan. In this regard, it is expected that by mid-July 2024, the TSO will submit its TYNDP proposal.

SMART GRIDS

Smart grids are a reality that has been gradually integrated into and developed in the Portuguese electricity system. Starting with the mass deployment of smart meters, system operators develop new services for the capacity of the smart infrastructure. In order to promote and guide the development of services in smart grids, ERSE approved in 2019 the Code on Smart Grids Services (Code no. 610/2019, of 2 August), reformulated in 2023. This code defines a mandatory package of services to be provided by system operators and suppliers to clients integrated in a smart grid.

At the end of 2023, more than 5.5 million facilities had a smart meter (i.e., 86%) and about 4.8 million were integrated into smart grids (i.e., 74%). The following figure shows the evolution registered in recent years. It is important to note that the total number of installations in mainland Portugal is slightly over 6.4 million.

Figure 3-20 – Evolution of the number of smart meters installed and the number of installations integrated into a smart grid, 2018 to 2023



Source: data E-REDES, ERSE elaboration

In 2022, legislation was published (specifically, Decree Law no. 15/2022, of 14 January and Order no. 14064/2022, of 6 December) establishing the schedule for installing smart meters and integration into a smart grid, ensuring 100% customers coverage by the end of 2024. The timetable was published following a proposal submitted by ERSE to the Government⁵⁶.

3.1.5 LOW VOLTAGE DISTRIBUTION CONCESSIONS

Electricity distribution in the Portuguese electricity system, particularly in mainland Portugal, is carried out under a public service concession at two levels: i) a single concession of the National Distribution Network (RND) at MV and HV awarded by the State; and ii) municipal concessions for distribution at LV awarded by the 278 municipalities of mainland Portugal.

⁵⁶ Available online at: <https://www.erse.pt/media/pmdjohr3/cronograma-contadores-governo-dl15.pdf>

The concession contracts have a term of 20 years, ending at different times, between 2016 and 2026, depending on the various concessions. Most of them ended between 2021 and 2022. Their attribution, according to the law, must result from a public tender.

Law no. 31/2017, of 31 May, approved the general principles and rules regarding the organisation of public tender procedures for the award, by contract, of concessions intended for the exclusive exercise of the operation of municipal electricity distribution networks at low voltage. This law encourages territorial aggregation (several concessions awarded to a single concessionaire in a single procedure) and the synchronised launch of tenders.

Following the work carried out, because tenders had not yet been launched, article 285.⁹ of Decree Law no. 15/2022, of 14 January extended the term of concession contracts until the effective entry into operation of the successful tenderer for the concession to be selected in the tender, including those whose terms had already expired, allowing some of the contractual conditions to be amended by agreement between E-REDES and the National Association of Portuguese Municipalities (ANMP), in conjunction with the member of the government responsible for energy. In December 2022, E-REDES informed ERSE of the agreement reached with ANMP.

Subsequently, on 28 November 2023, Government Order no. 397/2023 was published, regulating the standard documents for the public tender procedure⁵⁷ for the award of low-voltage electricity distribution concessions in mainland Portugal. This Government Order regulates the standard documents for the public tender procedure for the award of low-voltage electricity distribution concessions in mainland Portugal, specifically: i) the procedure programme; ii) the procedure specifications and iii) the standard concession contract.

The procedure is made up of the following documents: i) the notices of the procedure; ii) the programme of the procedure, including its annexes; iii) the specifications, including its clauses and annexes and the invitation to tender, which is sent to qualified candidates.

The procedure documents will be made available in full, directly on the respective electronic platform, from the day of publication of the notice of the procedure in the Official Journal of the European Union.

⁵⁷ Tender limited by prior qualification, with international publicity.

Council of Ministers Resolution no. 27/2024, of 23 February established the timeframe for the award of municipal low-voltage electricity distribution concessions, complying with the provisions of Article 7 of Law no. 31/2017, of 31 May which determined the need to indicate a programme of actions, as well as the various acts required for the procedure, in conjunction with ANMP.

Under the terms of the aforementioned Resolution of the Council of Ministers, the following was determined:

- a) By 31 July 2024, ERSE must provide municipalities and inter-municipal entities with delegated powers in this area⁵⁸ with documentation on the assets and fixed assets allocated to low-voltage (LV) electricity distribution networks, and the information must subsequently be updated on the date of the opening of the procedure;
- b) The information must have a level of detail compatible with the provisions of the standard documents approved by Government Order no. 397/2023, of 28 November, particularly with regard to public lighting;
- c) The administrative entities shall provide the necessary clarifications to the entities that are part of the group of contracting entities that so request;
- d) 31 October 2024 as the deadline for municipalities and inter-municipal entities with delegated powers in this area to conclude an agreement to form a group of contracting entities;
- e) 31 October 2024 is set as the deadline for municipalities and inter-municipal entities with delegated powers in the matter, which choose not to join the group, to comply with the provisions of Article 5(3) of Law no. 31/2017, of 31 May, by attaching the technical and economic studies that served as the basis for this choice to the specifications of the autonomous public procurement procedures that they develop;
- f) Until 31 March 2025, the entities that make up the group of contracting entities shall ensure that all the decisions necessary to launch the public procurement procedure are taken;
- g) 30 June 2025 is set as the deadline for the representative of the group of contracting entities to launch the public tender procedure for the award of LV electricity distribution concessions in mainland Portugal.

⁵⁸ Under the terms of Article 4(1) of Law no. 31/2017, of 31 May.

3.2 PROMOTING COMPETITION

3.2.1 WHOLESAL MARKET

In 2023, the level of electricity market concentration remained at a similar level to 2022, despite more favourable hydrological conditions for hydropower generation by the dominant operator⁵⁹, EDP. On the other hand, there was smaller share of thermal generation compared to 2022 through a decrease in generation by combined cycle natural gas power plants.

As mentioned in Chapter 3.1.3, in 2023 the price differential hours between the MIBEL areas increased relative to 2022. Therefore, from a general point of view, despite better hydrological conditions, due to EDP generation assets sales to Movhera and new Iberdrola hydro assets (Daivões and Gouvães in 2022 and Alto Tâmega in 2023, making up the Alto Tâmega hydro system), 2023 was marked by a neutral evolution for the dominant operator EDP, leading to no change in the global concentration of electricity generation. Nevertheless, a high concentration level lingers in the electricity market and the implementation of further measures to foster competition and promote transparency should follow on from already achieved developments.

3.2.1.1 MONITORING THE PRICE LEVEL, TRANSPARENCY LEVEL AND THE LEVEL AND EFFECTIVENESS OF MARKET OPENING AND COMPETITION

PRICES

Spot market prices

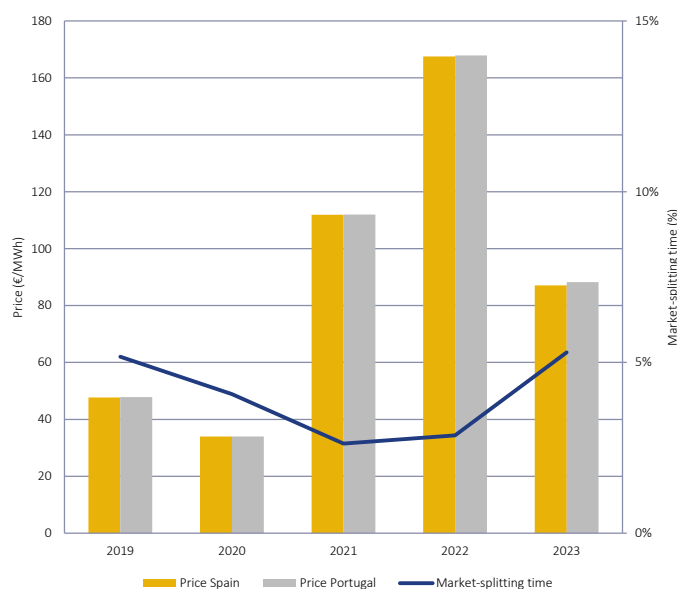
The evolution of prices generated on the wholesale market in Portugal is intrinsically related to the integration of the Iberian market and the participation of Portuguese agents in MIBEL.

The spot market price is common to Portugal and Spain, except in situations in which there is interconnection congestion, resulting in the need to apply the market-splitting mechanism, and thus, resulting in different prices in the two countries.

⁵⁹ The MIBEL Board of Regulators' document "Dominant Operator - Methodology and Applications" defines a dominant operator as any company or business group that holds a market share of more than 10% of the electricity produced within MIBEL.

The evolution of the annual average price in the spot market, in Portugal and Spain, between 2019 and 2023, as well as the percentage of market splitting time are presented in Figure 3-21.

Figure 3-21 – Evolution of annual average spot market price and market splitting, 2019 to 2023



Source: OMIE data

In 2023, the average price on the spot market for Portugal was 88.27 €/MWh, about 47 % below the price recorded in 2022 (167.89 €/MWh).

Compared to the previous year, there were significantly more favourable hydrological conditions and a resulting increase in hydropower generation. There was a reduction of thermal production costs despite the impacts resulting from the Ukraine invasion. Despite this, there was a decrease in the demand for this type of production. The downward trend in natural gas supply costs, albeit an increase in the CO₂ license emission markets, contributed towards the decrease in Portuguese spot market prices.

In 2023, the average market price in Portugal was approximately 22 % below the marginal⁶⁰ reference cost for combined-cycle natural gas power plants, excluding the cost component associated with access to the high-pressure natural gas network.

⁶⁰ Estimated marginal cost computed according to the methodology adopted by the ERSE Manual of Procedures for Global Technical Management System of the electricity sector, which excludes the estimate for third party access to the high-pressure natural gas network. The marginal cost of the combined-cycle natural gas thermal power stations is published at: <https://mercado.ren.pt/PT/Electr/InfoMercado/InfSistema/BandaSecundaria/Paginas/AjustePrc.aspx>.

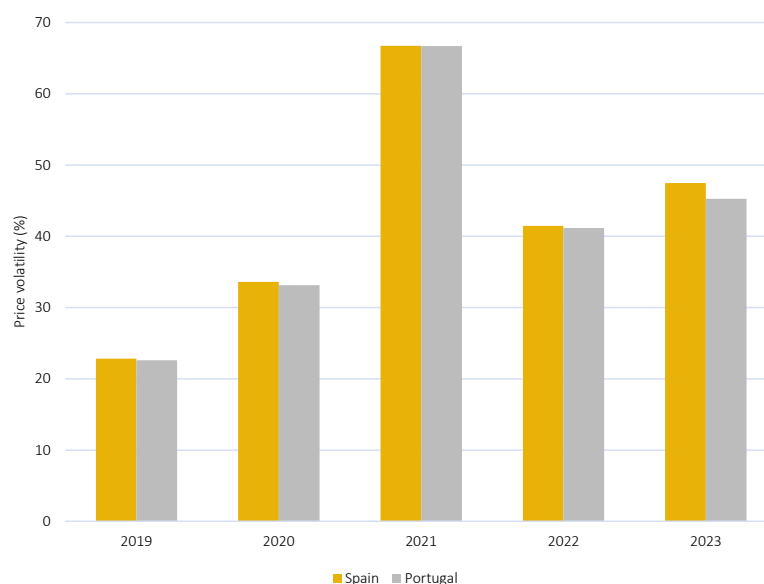
The exceptional mechanism for adjusting production costs in MIBEL with repercussions in the MIBEL wholesale spot market came into force on 15 June 2022 after an agreement between the governments of the Portuguese Republic and the Kingdom of Spain. This exceptional mechanism accounts for why the average spot market prices in 2023 were below the marginal reference cost for combined-cycle natural gas power plants.

Regarding the setting of the spot market price, the market's volatility is a factor that is considered important by market agents, namely as regards the need to cover price risks.

In 2023, the volatility of the spot market price for Portugal, measured as the coefficient between the standard deviation of prices in the year and the respective average price, was approximately 45%, which means prices ranged, on average, between 48 €/MWh and 128 €/MWh.

Figure 3-22 shows the evolution of the annual volatility of the spot market price, from 2019 to 2023, for both Portugal and Spain. It shows an increase in the spot price volatility between 2022 and 2023, as a result of the hydrological conditions but mainly the evolution of the price commodities related to the price formation of thermal power plants, namely the natural gas price and the CO₂ emission costs.

Figure 3-22 – Volatility of spot price, 2019 to 2023

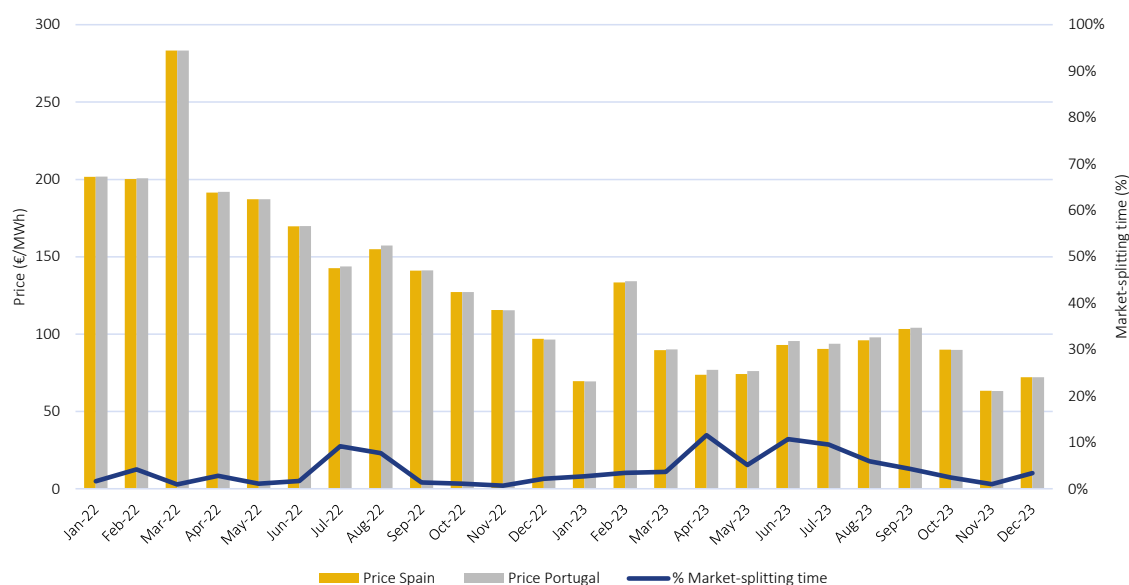


Source: OMIE data

Note: volatility measured as a ratio between the standard imbalance of the spot price and the respective annual average.

Figure 3-23 presents the evolution of prices in Portugal and Spain and the percentage of market splitting time, on a monthly basis, for 2022 and 2023.

Figure 3-23 – Spot market price and market splitting, 2022 and 2023



Source: OMIE data

Regarding 2023, the following should be highlighted: (i) despite some volatility, there was a decrease in the average market price compared to 2022; (ii) more favourable hydrological conditions throughout the year and continued high costs of commodities linked to thermal production; and (iii) an increase in market splitting compared to 2022.

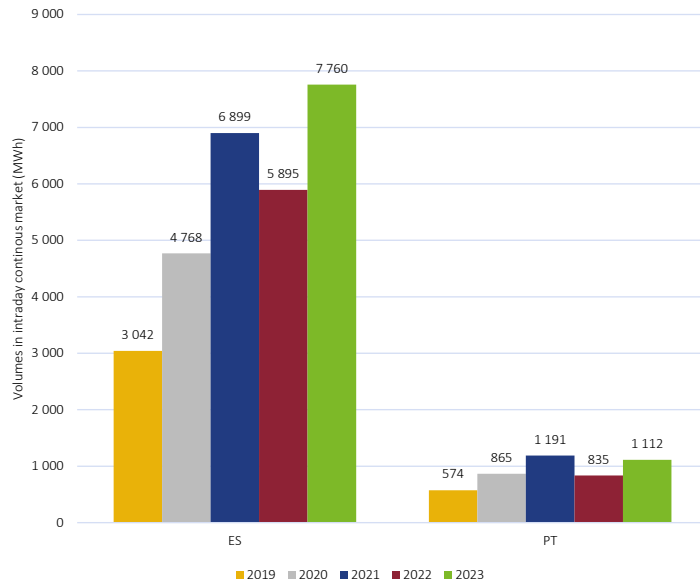
Intraday continuous market prices (XBID)

As previously mentioned, the XBID project (*European Cross-Border Intraday Initiative*) started on 13 June 2018 with the first phase go-live, delivering electricity intraday continuous negotiation in several European countries, including Portugal and Spain.

Figure 3-24 presents the negotiated volume⁶¹ since 2019 until the end of 2023, for Portugal and Spain.

⁶¹ The methodology to compute negotiated energy volumes in each price zone considers the negotiated energy volume, namely buying and selling, by counterparts, which belong to those price zones.

Figure 3-24 – Negotiated volume in the intraday continuous market, 2019 to 2023

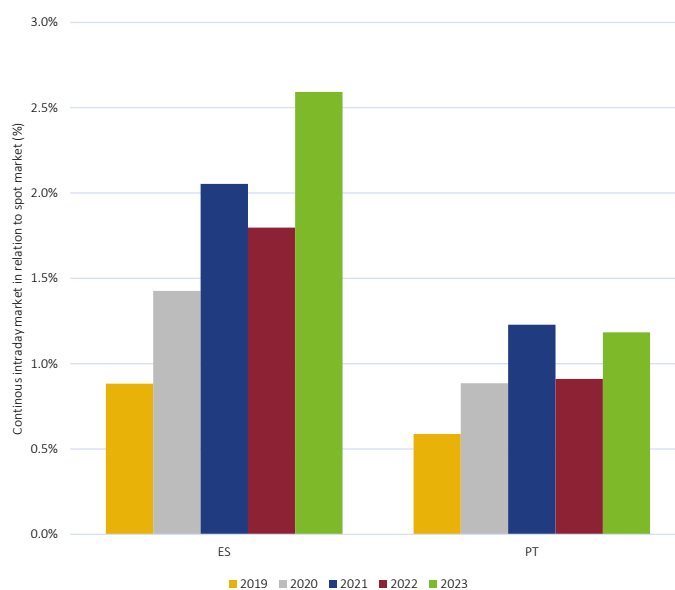


Source: OMIE data

Since 2019, excluding 2022, there was an increase trend in the negotiated volume for each price zone (Portugal and Spain). In Portugal, the increase between 2022 and 2023 wasn't enough to surpass the 2021 volumes.

Figure 3-25 compares negotiated volumes between the continuous intraday market and the daily spot market, since 2019 until the end of 2023, for Portugal and Spain.

**Figure 3-25 – Comparison of negotiated volumes
in the continuous intraday market and the daily spot market, 2019 to 2023**



Source: OMIE data

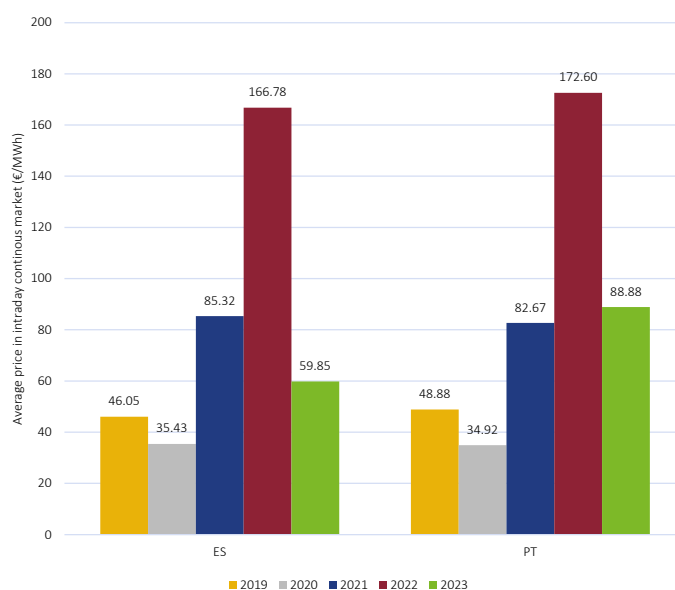
In 2023, the negotiated volume in Portugal in the continuous intraday market amounted to about 1.2 % of the daily spot market volume (around 1112 GWh). This was an increase compared to 2022, which can be understood by the evolution of liquidity levels in this market.

Figure 3-26 presents the weighted continuous intraday market price⁶² since 2019 until the end of 2023, for Portugal and Spain.

The figure shows a general decrease in the average weighted price for Portugal and Spain, in line with similar developments in the daily spot market.

⁶² The methodology to compute the weighted average price in each price zone considers the weight of the price of the negotiated energy volumes, namely buying and selling, by counterparts which belong to those price zones.

Figure 3-26 – Continuous intraday market weighted average price, 2019 to 2023



Source: OMIE data

Forward market prices

The model for MIBEL's functioning provides for the existence of references for forward contracts in an organised market, where agents can place some of their electricity needs, namely to define in part the future price for electricity to be supplied to end-users. The forward market is, in fact, an additional tool for agents to be able to mitigate the risks of price volatility and to ensure the availability of electricity (supply) or to meet demand with greater predictability and stability.

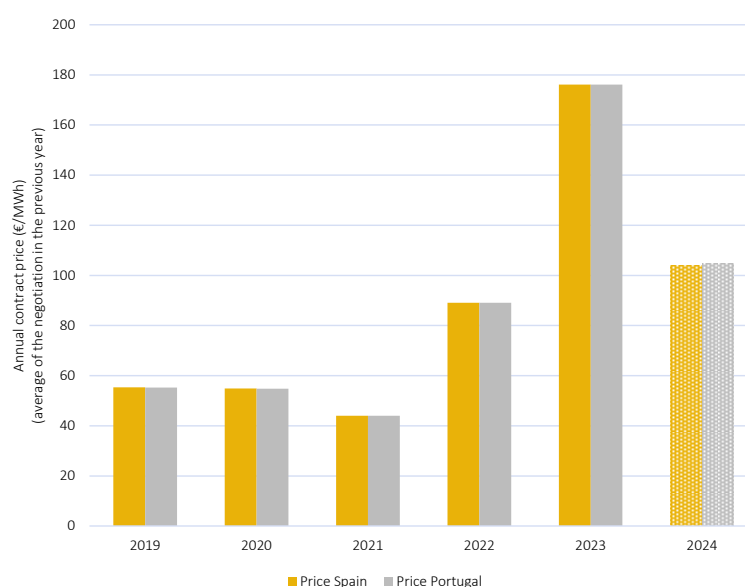
The spot market is a fairly liquid platform in the Iberian context. In the Portuguese case, approximately 92% of 2023 consumption was met through contracts made in this market referential⁶³. In this context, as there is no intrinsic market problem of liquidity or depth within the definition of the classic indicators (number of transactions, market volume, dispersion of traded volumes), there is a growing need to cover the risks of fluctuating spot market prices. One of the most efficient and transparent answers is the use of organised market platforms for forward contracting, in this case, the market managed by OMIP that was formally established within the scope of the agreement for the creation of the MIBEL.

⁶³ Includes daily market and intraday auctions.

The evolution of the price set in the forward market saw a sharp increase between 2022 and 2023, and a sharp decrease between 2023 and 2024. Market agents who had acquired in 2022 a position in a base load contract with a 2023 delivery would have paid an average price (176.17 €/MWh for Portugal⁶⁴), about 100% above than the price set in the spot market. This difference is a consequence of the evolution in 2023 of the costs of commodities which influence price formation for natural gas combined cycle plants.

Figure 3-27 presents the evolution of the average market closing prices related to an annual contract with a base load delivery.

Figure 3-27 – Evolution of the average price for annual futures contract negotiation (delivery in Portugal and in Spain), 2019 to 2024



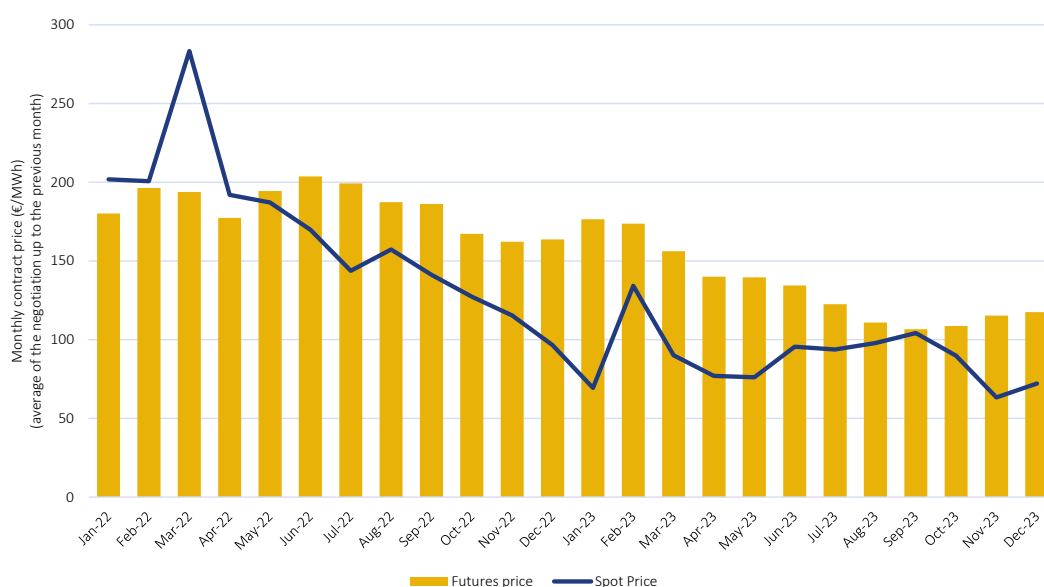
Source: OMIE data

Note: the average closing price for the year prior to delivery, for a base load delivery (e.g. the 2024 price corresponds to the average price set during 2023).

Figure 3-28 presents the evolution of monthly futures contract prices in the OMIP managed market, as well as of the spot negotiation price, both for Portugal. The evolution of the forward price of monthly contracts showed, on average, a downwards trend throughout 2023.

⁶⁴ The value of the forward provisioning price reflects the average weighted value per contract volumes of shares of the 2023 annual contract with delivery in the Portuguese area of MIBEL, including the record of auction, continuous and over-the-counter (OTC) operations.

Figure 3-28 – Evolution of the average price for negotiating the monthly futures contract (delivered in Portugal), 2022 and 2023



Source: OMIE and OMIP data

In 2023, the negotiation of monthly future contracts with a base load delivery yielded a risk premium (difference between the forward price and the *spot* price, for the corresponding month) in forward contracting along all the year. There wasn't any month where the situation was more favourable for agents with forward market negotiation.

During 2023, as part of the implementation of the forward contracting mechanism for energy acquired from guaranteed revenue generation, no guaranteed revenue generation auctions were held.

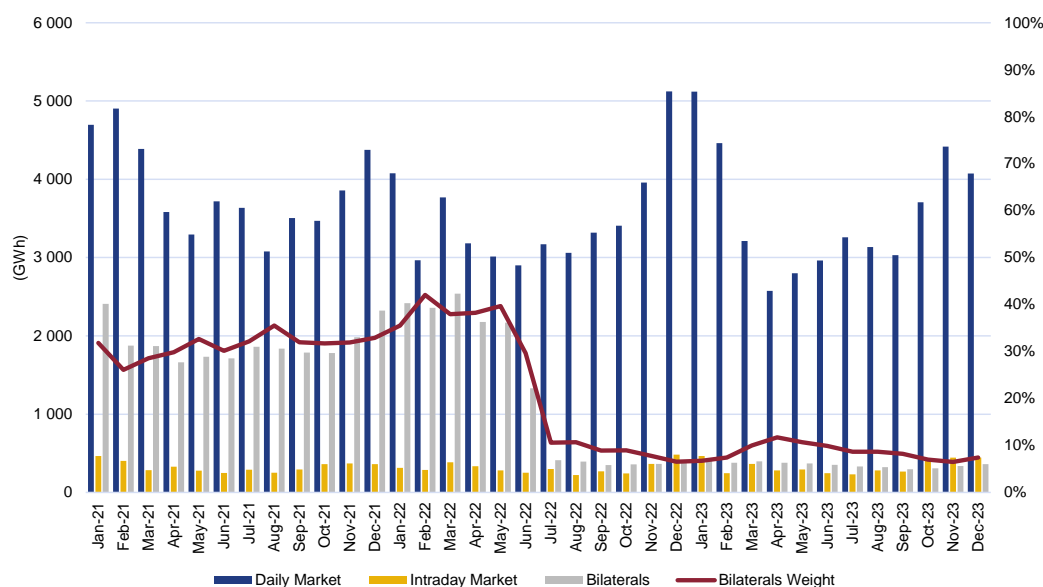
As a complement to the ordinary guaranteed revenue generation auctions, ERSE through the publication of the Regulation no. 11/2021, of 15 October, which set up several extraordinary measures in the electricity national system and the gas natural systems, applicable to commercial relations between markets agents in said systems, established a mechanism for extraordinary guaranteed revenue generation auctions, with specific contracting conditions for electricity supplied by guaranteed revenue generation by market agents specified in Section III of said regulation. During 2023, no extraordinary guaranteed revenue generation auctions were held.

Also, during 2023 and as part of the implementation of the forward contracting mechanism for energy supply by the supplier of last resort (SOLR), five SOLR supply auctions were held (12th, 13th, 14th, 15th and

16th), with the placement of three distinct products (one annual base load and two quarterly base loads). These auctions resulted in the placement of 100 MW in the year of 2023, 55 MW in the third quarter of 2023 and 70 MW in the fourth quarter of 2023. The volume of energy placed with this instrument amounted to approximately 2% of national consumption (1152.07 GWh). The auctions held for 2023 delivery ensured the full placement of the minimum volumes open for negotiation and allowed a stabilisation of the SOLR supply price.

Regarding the spot market (daily and intraday markets), in Portugal negotiation is much higher than for bilateral contract trading, as shown in Figure 3-29. It is useful, however, to bear in mind that the acquisition of fixed-term products listed on the MIBEL forward market could be settled through the daily market.

Figure 3-29 – Breakdown of energy supply volumes between markets, 2021 to 2023



Source: OMIE and REN data

The average weight of bilateral contracts in 2023 was 8.3% or 4 TWh. Comparing with 2022, there was a decrease in the average weight of bilateral contracts and also a decrease in its absolute value (decrease of 72%, equivalent to 11 TWh).

It is worth mentioning that the energy volume associated with bilateral trading takes into account the firm positions taken by market agents in the spot market. The main reason for this reduction in bilateral contracts comes from several agents stopping the use of generic market units in spot market purchases which would then establish bilateral contracts within the system operator to supply their customer portfolios. This development resulted from the exception established in Article 7 of Decree Law no.

33/2022, of 14 May, regarding the Exceptional Mechanism for Adjusting Production Costs in MIBEL which began on 15 June.

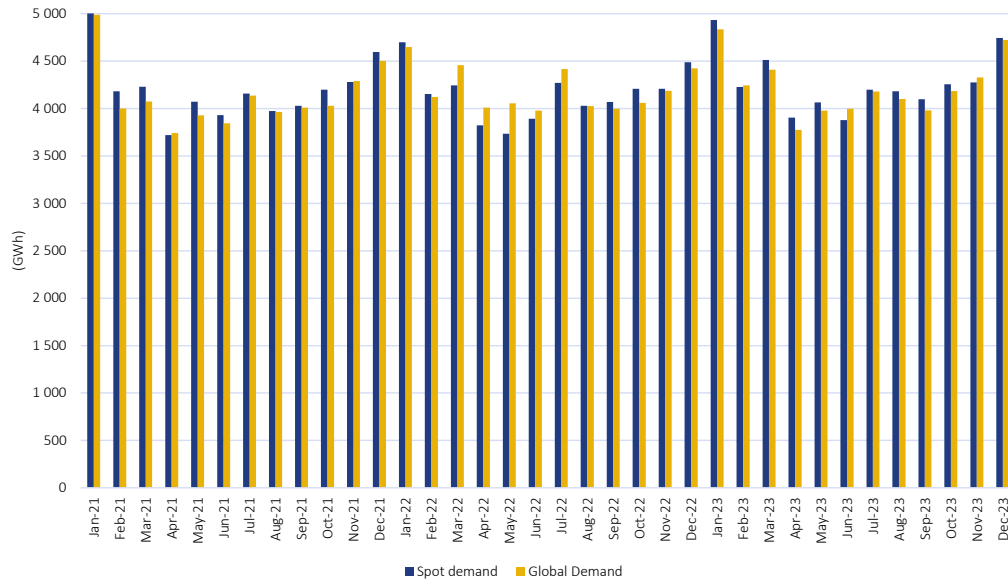
Evolution of the market

Spot contracting in the wholesale market in Portugal is part of the project to deepen MIBEL, within the single market for Portugal and Spain with an associated mechanism for dealing with congestion on a daily basis, based on market splitting whenever the flow of electricity generated by aggregated demand and supply exceeds the commercial capacity available on the interconnection. The contracting structure of the spot market is characterised by the following aspects:

- On the demand side, agents registered in Portugal, including the SOLR, place most of their demand on the spot market;
- On the supply side, all market agents offer their supply mostly on the spot market. In the case of endogenous, renewable and non-renewable resources and combined heat and power generators with guaranteed remuneration, their supply is placed on the spot market through the single buyer for this generation - the SOLR - who aggregates the expected generation and submits the offers to the market.

The evolution for spot market demand and overall consumption in mainland Portugal is shown in Figure 3-30, where it can be seen that demand is met by spot market acquisitions.

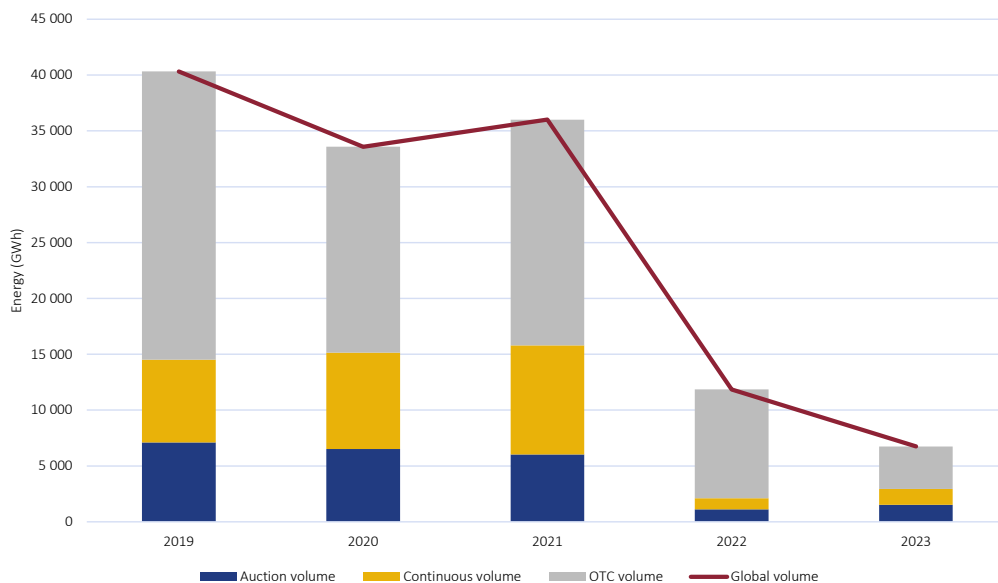
Figure 3-30 – Spot market demand and total monthly consumption, 2021 to 2023



Source: OMIE data

Figure 3-31 shows the evolution of the volumes recorded in the organised forward market between 2019 and 2023. In 2020, there was a decrease in the overall trading volume of 17%, equivalent to 6.7 TWh. In 2021, there was a 7 % increase, or 2.4 TWh. Regarding 2022, there was a sharp 67% decrease (24.2 TWh). Regarding 2023, there was an additional 43 % decrease (or 5.1 TWh)

Figure 3-31 – MIBEL forward market volumes, 2019 to 2023



Source: OMIP data

TRANSPARENCY

From a market monitoring point of view, it is important to consider the transparency rules in the markets. The wholesale electricity market in Portugal benefits from a regulatory system which already imposes obligations to disclose insider information to the market. Indeed, the requirements to report relevant facts under the RCC were implemented several years ago and are comparable to the requirements in the Regulation on Wholesale Energy Market Integrity and Transparency (REMIT)⁶⁵ regarding the obligation to report insider information.

The reporting of transactions and trading orders associated with contracts negotiated in organised market platforms across the entire European Union began on 5 October 2015, in accordance with the schedule provided for in Article 12 of the Commission Implementing Regulation (EU) no. 1348/2014 of 17 December, on data reporting, implementing Articles 8(2) and 8(6) of REMIT. All the contracts mentioned in Article 3, traded in the organised market platforms managed by OMIE and OMIP, are covered by this obligation.

The reporting of transactions and trading orders associated with contracts related to electricity transmission concluded following an explicit primary capacity allocation by the transmission network operator and contracts negotiated outside the organised market platforms began on 7 April 2016 across the entire European Union. The calendar for this reporting was set out in Article 12 of the Commission Implementing Regulation (EU) no. 1348/2014 of 17 December, in order to give effect to the data reporting obligations in Articles 8(2) and 8(6) of REMIT, as well as other relevant market information concerning the final assignments of electricity transmission capacity between bidding areas.

Among the facts subject to reporting obligations are the unplanned unavailability of electricity generation plants including updates on their status, in addition to network unavailability (transmission and distribution) which may affect consumption or price setting. Alterations to the capacity commercially available on the Portugal-Spain interconnection also require reporting by REN, as the system manager, as do significant imbalances in the system aggregate consumption forecast and/or of each particular agent.

Insider information can be reported in Portugal in a centralised manner, and is available on a portal managed by REN⁶⁶ without excluding the European regulatory framework possibility of using other ACER

⁶⁵ Regulation (EU) no. 1227/2011 of the European Parliament and of the Council on wholesale energy market integrity and transparency

⁶⁶ <http://www.mercado.ren.pt/PT/Electr/InfoMercado/Paginas/default.aspx>

certified IIP⁶⁷ platforms. Since February 2023, EDP GEM Portugal stopped using REN's platform and started using OMIE's⁶⁸ IIP platform.

During 2023, 3517 relevant facts were reported in REN's IIP platform. Of these, approximately 42% concerned generation unavailability, 29% to secondary ancillary services unavailability, 17% to changes in the interconnection capacity available for the market and 12% to hydropower plant constraints.

During 2023, 4195 relevant facts were reported in OMIE's IIP platform. All of those concerned generation unavailability.

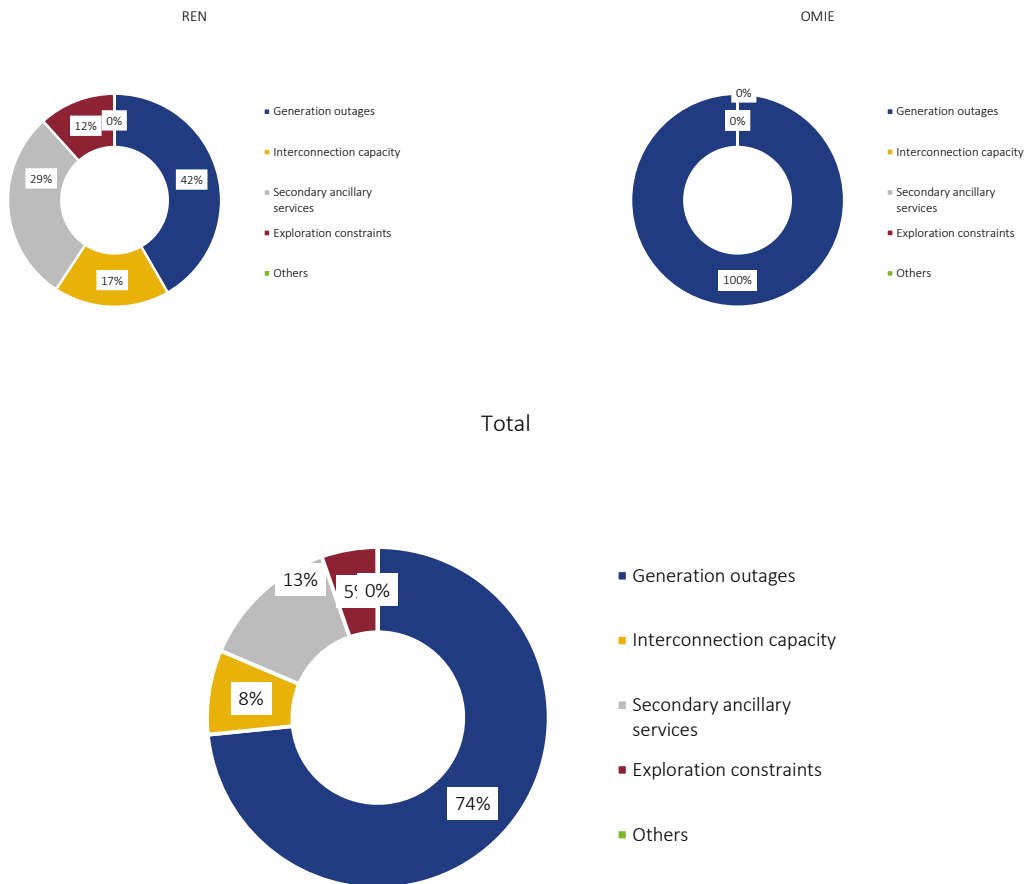
In total during 2023, 7712 relevant facts were reported. Of these, approximately 74% concerned generation unavailability, 13% to secondary ancillary services unavailability, 8% to changes in the interconnection capacity available for the market and 5% to hydropower plant constraints.

Figure 3-32 presents the relevant facts reporting.

⁶⁷ IIP, Inside information platform

⁶⁸ <https://umm.omie.es/electricity-list>

Figure 3-32 – Reporting of relevant facts, 2023



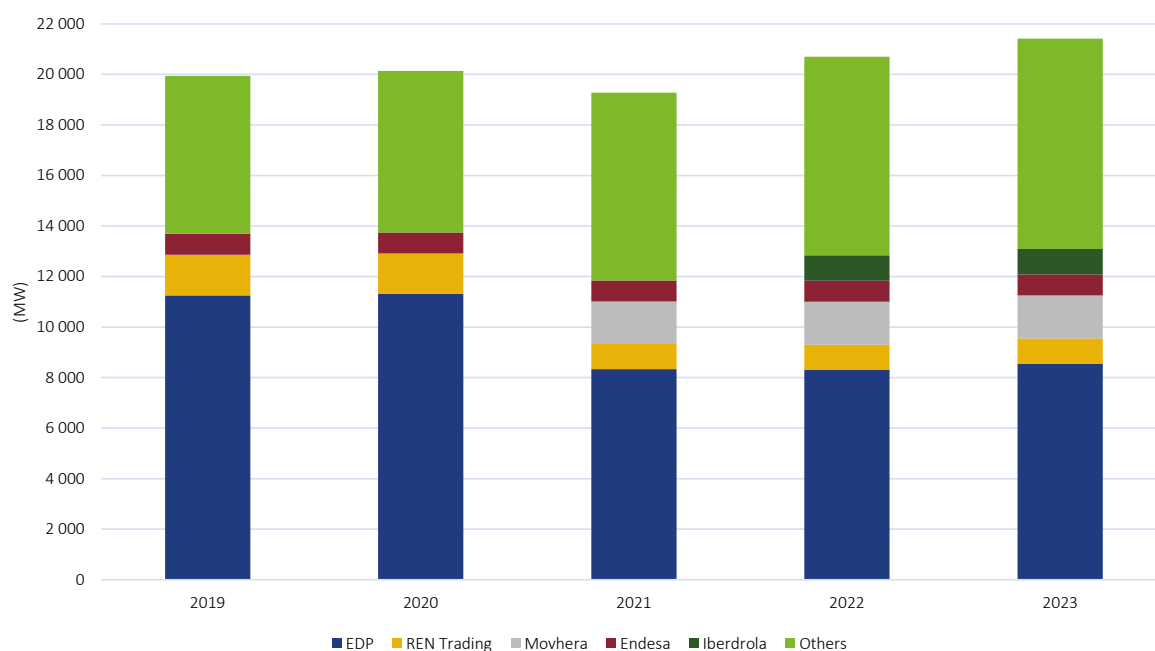
Source: REN data, OMIE data

EFFECTIVENESS OF COMPETITION

The wholesale market must be assessed by evaluating the installed capacity and its effective production. To this end, it is important to analyse the evolution of the primary energy used.

In addition to the installed capacity breakdown by technology, it is important to assess the installed capacity breakdown by ownership. Figure 3-33 shows that the EDP group (including EDP Production and EDP Renewables) owns most of Portugal’s installed capacity.

Figure 3-33 – Installed capacity in Portugal by ownership, 2019 to 2023



Source: REN data, EDP group. Note: "Other" includes all undertakings that hold SRG assets with guaranteed revenue. The values refer to the end of each year.

On 17 December 2020, EDP announced⁶⁹ the conclusion of the sale of a portfolio with six hydropower plants to an investor consortium composed by Engie (40%), Crédit Agricole Assurances (35%) and Mirova – Natixis Group (25%). This hydropower plant portfolio amounts to a 1 689 MW installed capacity and is located in the Douro basin. It is composed of three run-of-the-river plants (Miranda, Picote and Bemposta) with a 1.2 GW installed capacity and three pumped storage plants (Foz Tua, Baixo Sabor and Feiticeiro) with a 0.5 GW installed capacity. Movhera is the company resulting from the transmission of the mentioned consortium portfolio.

EDP announced the anticipated closure of the Sines coal-fired power plant⁷⁰. On 14 July 2020, EDP delivered a statement to DGEG renouncing the plant production license so that it could terminate its activities by January 2021. In addition, the Pego coal-fired power plant which was represented by REN Trading ceased its operations in November 2021.

⁶⁹ EDP press release: https://www.edp.com/sites/default/files/2020-12/20201217_Closing%206%20Hydro%20Plants_EN.pdf

⁷⁰ <https://www.edp.com/en/news/anticipation-shutdown-process-coal-power-plants-iberia>

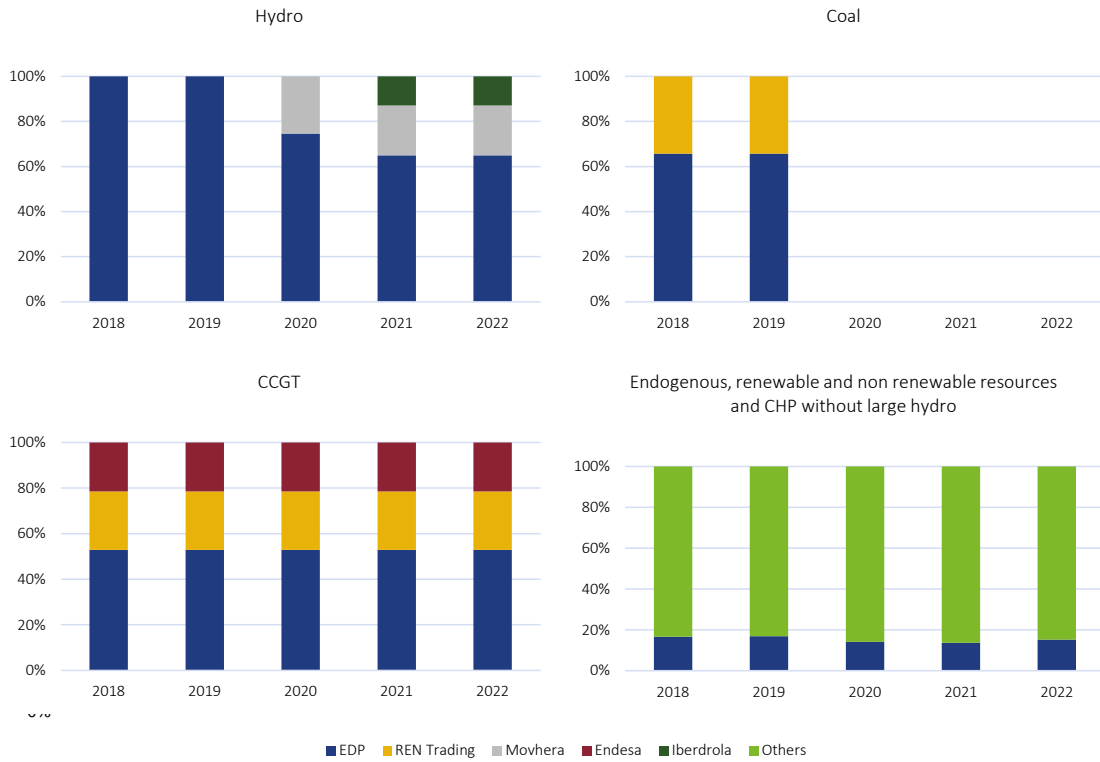
In July 2022, Iberdrola started the Tâmega hydro production project. The Tâmega hydro complex is composed of three plants – Alto Tâmega, Daivões and Gouvães - and accounts for a 1 158 MW total installed capacity. The Tâmega plant expected to begin operation in 2024. As of 2023, the Daivões plant, with an installed generation capacity of 118 MW, and the Gouvães plant, with 880 MW installed generation capacity and 880 MW installed pump capacity, are in industrial operation. Additionally, the Alto Tâmega plant, with 160 MW installed generation capacity, will begin operation in 2024.

The review of the wholesale market also includes an evaluation of concentration, both in global terms and also in terms of each of the generating technologies.

The evolution of the quotas of the different agents in terms of installed capacity by technology or regime is presented in Figure 3-34. All factors combined, the concentration level of the electricity generation segment in Portugal is high in terms of installed capacity, as can be seen in Figure 3-35, which presents the Herfindahl-Hirschman Index (HHI⁷¹) values, measuring corporate concentration.

⁷¹ The Herfindahl-Hirschman Index (HHI) is a measure of concentration of businesses within the same activity sector and an indicator of the level of competition between them based on their market shares.

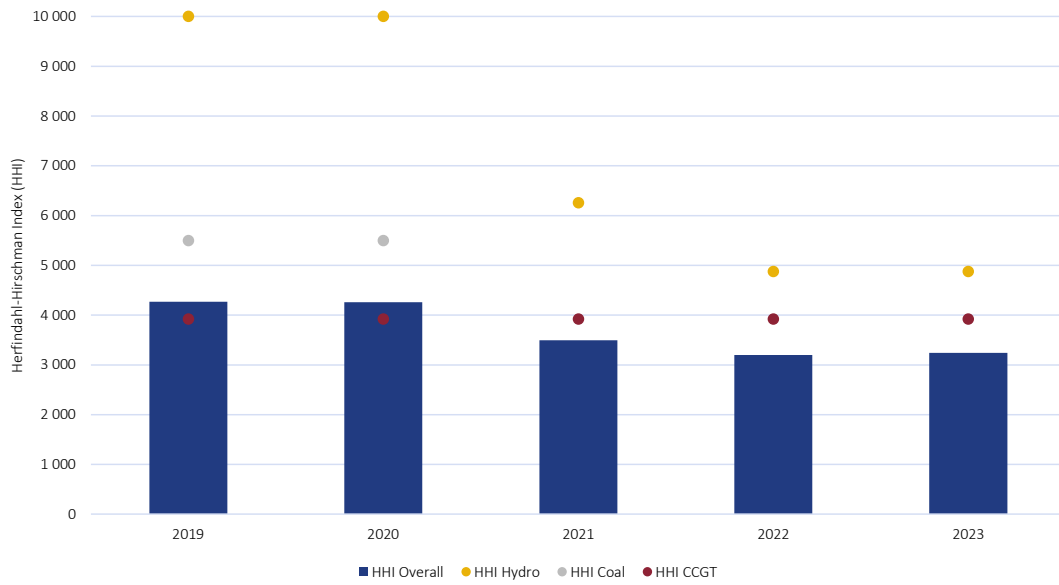
Figure 3-34 – Share of installed capacity by agents and technology for mainland Portugal, 2019 to 2023



Source: REN data and EDP group

The HHI figures for installed capacity show that there were no significant changes in market concentration in the natural gas combined cycle sector. Regarding hydropower, in 2021 the effect of EDP’s asset sales to Movhera can be seen, while in 2022 the impact of Iberdrola’s new generation assets is observed. It is worth highlighting the end of coal-fired power plants in 2021 as a means of electricity production.

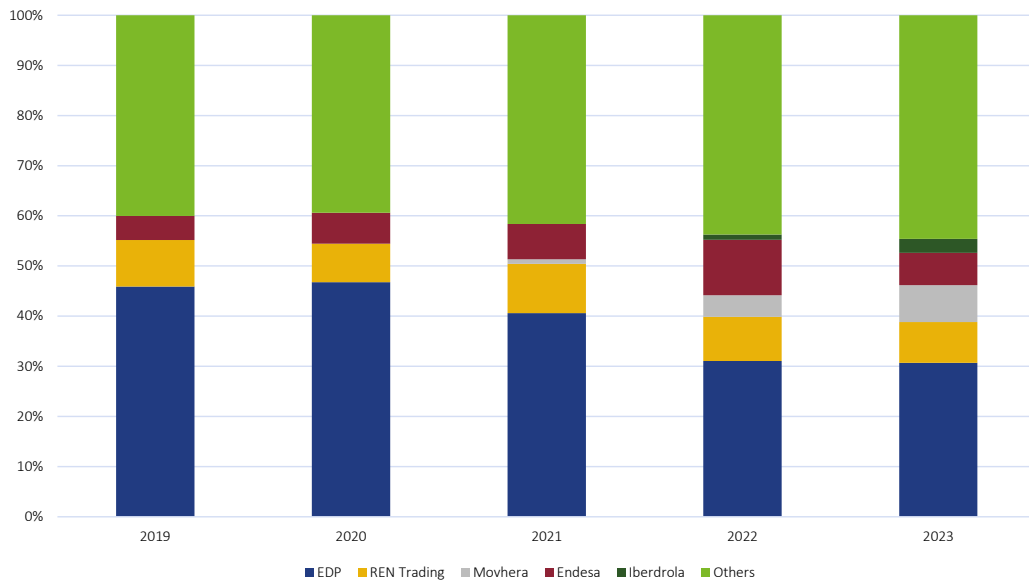
Figure 3-35 – Concentration in terms of installed capacity, 2019 to 2023



Source: REN data and EDP group

Electricity generation quotas by agent are shown in Figure 3-36.

Figure 3-36 – Energy generation quotas by agent, 2019 to 2023

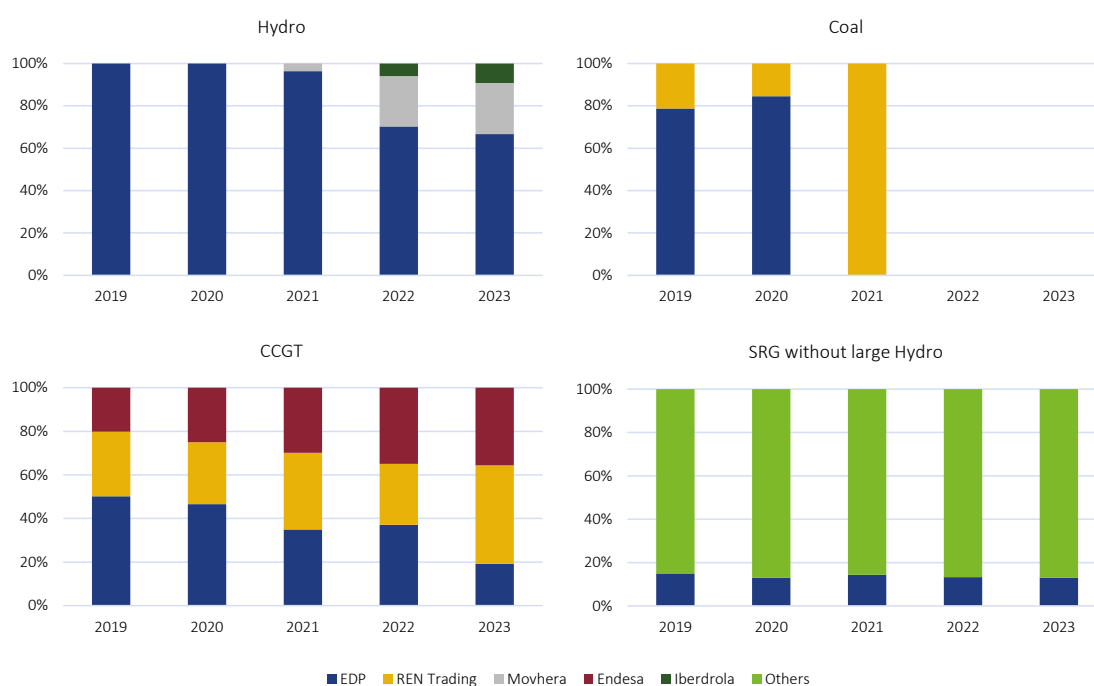


Source: REN data and EDP group. Does not include energy net import figures on the Spain-Portugal interconnection.

For 2021, it is worth noting that there was a decrease in the EDP Group's participation in total generation in mainland Portugal, mainly due to a decrease in hydropower generation due to less favourable hydrological conditions, the sale of hydro assets, the Sines coal-fired power plant closure and a relative decrease in its combined cycle gas power plants production. Regarding 2022, the EDP Group's smaller participation is also due to unfavourable hydrological conditions and the new generation by Iberdrola's hydro assets. In 2023, there was an increase by the agents with exclusively hydro production.

Electricity generation quotas by agent considering technology and SRG with guaranteed remuneration are presented in Figure 3-37.

Figure 3-37 – Energy produced by agents by technology, 2019 to 2023



Source: REN data and EDP group

Regarding electricity production, the trend between 2019 and 2023 points towards distinct trends in the dominant operator EDP's generation quota in each of the main technologies.

For endogenous, renewable and non-renewable resources and CHP without large hydro, from 2019 to 2023, this situation remained relatively unchanged despite a downward tendency for EDP.

In relation to hydropower production, until 2020 the exclusive presence of the dominant operator EDP continued, as it owned all the major hydropower plants. In 2021, the assets sale to Movhera resulted in

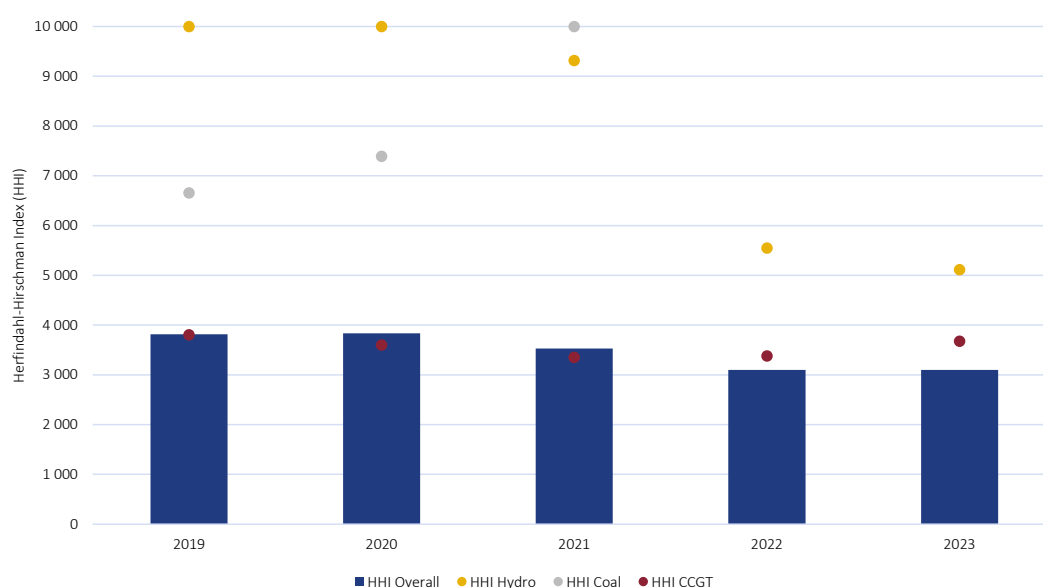
relative quotas changes. In 2022 and 2023, there was a similar evolution due to Iberdrola's new hydropower assets.

Regarding natural gas combined cycle plants, there was a in 2023 compared to 2022. This variation of approximately 6.0 TWh, in absolute terms, resulted mainly from reduced production by the EDP (Lares and Ribatejo plants) and Endesa (Pego CCGT) generating assets. The assets managed by REN Trading (Turbogás plant) kept an approximate equal production level.

Coal-fired power plants had no production in 2023 as in 2022. This situation resulted from closure of all coal-fired power plants by both the EDP Group (Sines plant in the beginning of 2021) and REN Trading (Pego plant in November 2021).

The concentration indicators for electricity generation presented in Figure 3-38 show that, in 2023, generation was similarly concentrated as in 2022. This evolution is mainly linked to EDP group's reduced thermal production as opposed to its increased hydro production.

Figure 3-38 – Concentration in terms of electricity generation, 2019 to 2023



Source: REN data and EDP group

At the same time, one should bear in mind that as a more detailed analysis is not possible, the generation by endogenous, renewable and non-renewable resources and combined heat and power without large hydro with guaranteed remuneration not controlled by EDP is reflected as a single entity (a single market share), for the purpose of calculating the concentration indicators. Therefore, if on the one hand, the true

evolution of market concentration in this category cannot be assessed, on the other hand, the figures for overall concentration will be equal to or smaller than those that actually occur in the current market structure.

INVESTIGATIONS AND MEASURES TO PROMOTE EFFECTIVE COMPETITION

In the Portuguese legislative framework, the sectorial regulatory bodies, which include ERSE, cooperate with the Competition Authority in matters of defence and promotion of competition, under the terms of the framework law for regulatory bodies and of the legal framework for competition.

In turn, within the scope of its Statutes⁷², ERSE must promote and defend the existence of a competitive environment, namely by identifying and notifying the Competition Authority of situations which may constitute practices restricting competition. Additionally, national legislation, including the legal framework for competition, approved by Law no. 19/2012, of 8 May, in its current wording, establishes the principle of collaboration between sectorial regulators and the Competition Authority.

ERSE is responsible, under Article 5.º of its Statutes, for "fostering and ensuring compliance with competition rules in the sectors it regulates, without prejudice to the competences of the Competition Authority", and is also responsible for "reporting to the Competition Authority the practices restricting competition of which it is aware and collaborating with it in the corresponding sanctioning procedure".

The obligation of articulation between the Competition Authority and the sectorial regulatory authorities in the scope of merger control also follows from the legal framework for competition. Thus, whenever a concentration of companies has an impact on a market which is subject to the sectorial regulation of ERSE, the Competition Authority, before taking a decision which terminates the procedure, requests that ERSE issues an opinion on the notified operation, setting a reasonable deadline for that purpose.

In these terms, ERSE must be consulted by Competition Authority in the scope of corporate concentration processes, whenever the entities involved operate in the electricity market. Under the terms of the law ERSE's opinion is not binding but the measures to minimise the competition risks (commonly known as "remedies" of the operation) may be monitored by ERSE.

⁷² Decree Law No. 97/2002, of 12 April, in its current wording.

The monitoring of competition in electricity markets has both a structural and a behavioural dimension. It tends to be the responsibility of sectorial regulation to act on the structural conditions of competition in the market, namely through regulation which must induce principles of competitive development of the market. In the framework of behavioural action, ERSE, as sectoral regulator, has specific powers to monitor the functioning of the electricity market.

During 2023, nine opinions were issued, requested by Competition Authority, concerning the following concentration operations relative to the electricity sector, broken down into the electricity and electric mobility market segments:

- Concentration operation consisting of the acquisition by Atlante S.R.L. of exclusive control over Kilometer Low Cost, S.A., through the acquisition of the majority of the share capital and voting rights of KLC Infra, from the companies Estrela Capital, S.A.; Bonera Group - SGPS, S.A.; and Smartwatt - Energy Services, S.A..
- The operation concerned the market for the installation and operation of charging points for the electric mobility network. ERSE did not oppose the operation in question, as it had no substantial impact on the structure of the electric mobility market.
- Concentration operation consisting of the acquisition by EDP Renewables, SGPS, S.A., of exclusive control over the company Parque Eólico de Moncorvo, Lda, briefly referred to as Morgavel.
- The operation concerned electricity generation, and the companies involved in this operation operate or, in the case of the acquired company, intended to operate in the electricity generation segment, both under the guaranteed remuneration regime using a renewable source and under the so-called market regime, under the terms of the applicable legislation.
- Given the uncertainties and contours of this operation, ERSE expressed to the Competition Authority the need to gather additional information and possibly re-evaluate the operation in a different perimeter if the involvement of other production assets was confirmed.
- Within the scope of this operation, it was also proposed that, once this information had been obtained, in the event that it changed the design of the operation, the operation in question should

be re-examined, as well as adopting a precautionary measure to compensate for the non-realisation of the energy storage potential allocated to the Moncorvo wind farm.

- Concentration operation consisting of the acquisition by EDP Renewables, SGPS, S.A. of exclusive control over Sociedade Produção de Energia Eólica, S.A..
- The operation concerned electricity generation. In the context of this operation, ERSE raised a number of reservations, partly identical to those formulated with regard to the EDP Renewables, SGPS, S.A./Morgavel merger, which should be taken into account with regard to the impact that the operation could have on the Notifying Party's market power, both in electricity generation and in the market structure associated with the supply of system services.
- Concentration operation consisting of the acquisition by Finerge Alfama, S.A. of sole control over the company Corner and Border, S.A..
- The operation concerned the production of electricity from renewable sources. ERSE did not oppose the operation in question, as the Notifying Party's ability to influence the operational management of the assets involved in the merger and thereby influence the formation of the price of electricity on the wholesale market was reduced.
- Concentration operation consisting of the acquisition of Acciona Energía Internacional, S.A. acquiring sole control over Amper Central Solar, S.A..
- The operation concerned the electricity generation, and the companies involved in this operation operate in the segment of electricity production from renewable sources. ERSE did not oppose the operation in question, as the Notifying Party's ability to influence the operational management of the assets involved in the merger and thereby influence the wholesale market price seems limited.
- Merger consisting of the acquisition by Greenvolt Next Portugal Lda. of sole control over the company Ibérica Renovables, S.L..
- The operation involved an entity, the Notifier, which is active in the production of electricity from renewable sources. ERSE did not oppose the operation in question because it is of the non-horizontal type, since the Notifying Party did not intend to exercise exclusive control over any of its competitors in the market in which it operates. Furthermore, the fact that the Acquired Party did not dominate the market in which it operates also contributed to the operation not presenting

any risks in terms of barriers to access by Greenvolt's competitors to the construction of photovoltaic power stations.

- Concentration operation consisting of the acquisition by Enercapital Energia, Lda. (Enercapital) - a company that is part of the Sousa Group (GS) - and Albert Eberhard (AE) of exclusive control over the company Atlantic Islands Electricity (Madeira) - Produção, Transporte e Distribuição de Energia, S.A..
- ERSE did not oppose the operation in question, given that there is no competition in the electricity production activity in the Autonomous Region of Madeira, since Empresa de Eletricidade da Madeira, S.A. acts as a monopsony when buying from producers, and as a monopolist when selling to end-consumers. Therefore, the Notifying Parties would not be able to influence the normal functioning of the market in the region.
- Concentration operation consisting of the acquisition by Helios - Fundo de Capital de Risco Fechado, managed by LYNX Asset Managers - SGOIC, S.A. and by Mirova Energy Transition 5 S.L.P., managed by Mirova, S.A. of joint control over the company Hyperion Energy Investments SGPS, S.A..
- The operation concerned electricity generation, with the companies involved in this operation operating in the production of electricity from renewable sources. ERSE did not oppose the operation in question as it was not likely to create significant obstacles to effective competition in the national market or in a substantial part of it.
- Concentration operation consisting of the acquisition by Solar International Lda. of sole control of three companies: (i) C.S.N.S.P. 451, S.A. ("CSNSP 451"); (ii) C.S.N.S.P. 452, S.A.; (iii) Cubico Portugal Solar Holdings Spain, S.L. ("Cubico ES") and, consequently, its subsidiary, Cubico Portugal Solar Holdings, S.L. ("Cubico ES"). ("CSNSP 452"); (iii) Cubico Portugal Holdings Spain, S.L. ("Cubico ES")

and, consequently, its subsidiary Cubico Portugal Solar Holdings, S.A. and its subsidiary CEF Energia Ibérica, S.A..

- The operation concerned electricity production, and the companies involved in this operation were active in the production of electricity from renewable sources. ERSE did not oppose the operation in question as it was not likely to create significant obstacles to competition.

REGULATORY DEVELOPMENTS

Declarative Obligations pertaining to the “measure aimed at reducing the wholesale electricity prices in the Iberian wholesale electricity market”

The Governments of the Portuguese Republic and of the Kingdom of Spain agreed to set forth a measure aimed at reducing the wholesale electricity prices in the Iberian wholesale electricity market by lowering the input costs of fossil fuel-fired power stations, whose duration was extended as approved by the European Commission, under EU State Aid rules⁷³.

In the Portuguese legal framework, measure was initially approved by Decree Law no. 33/2022, of 14 May equivalent to the Royal Decree Law 10/2022, of 13 May enacted in Spain. Decree Law no. 21-B/2023, of 30 March in Portugal, mirrored by Royal Decree Law 3/2023, of 28 March in Spain, extended the duration of the measure until the end of 2023.

The execution of the measure and its extension implies that the cost of the adjustment paid to the fossil fuel power plants is borne by electricity demand and levied only on unhedged electricity customers or those without contracts for the supply of electricity at a fixed price.

The identification of the electricity volumes exempted from funding the cost of the measure depends on information reporting by MIBEL’s Markets Agents; an obligation enacted through ERSE’s regulations. The exemption rules adjusted by Decree Law no. 21-B/2023, of 30 March were executed with ERSE’s Directive no 10/2023 of 11 April, in line with Directive no. 11/2022, of 14 May, that implemented Decree Law no. 33/2022, of 14 May.

⁷³ European Commission Communication 2022/C 253/01, published on the Official Journal of the European Union of 1 July 2022 (Aid number SA.102569)

Revision of the ancillary services market settlement rules in line with the “measure aimed at reducing the wholesale electricity prices in the Iberian wholesale electricity market”

The measure aimed at reducing the wholesale electricity prices in the Iberian wholesale electricity market forcibly elicited the adaptation of the settlement rules and procedures applied by the TSO in the ancillary services market, namely Procedure no. 21-A of the MPGGS, approved by ERSE Directive no. 13-A/2022, of 21 June.

After the implementation of these changes, a number of market agents affected by the measure brought forth a set of questions pertaining to the repercussion and distribution of the measure in the ancillary services market, which brought forth a proposal from the TSO to change Procedure no. 21-A of the MPGGS for ERSE’s approval.

Based on a proposal from the TSO, ERSE prepared and performed changes to the ancillary services market settlement rules, with the approval preceded by a specific consultation, to allow relevant stakeholders to express their views. After the aforementioned consultation, ERSE approved Directive no. 8/2023, of 22 March changing Procedure no. 21-A of the MPGGS.

Manual of Procedures of the Issuing Body for Guarantees of Origin (EEGO)

The Procedures Manual of the Issuing Body for Guarantees of Origin (PM EEGO) sets out the EEGO's competences in implementing and managing a Guarantees of Origin (GO) system for electricity and heating and cooling energy produced from renewable energy sources and renewable and low-carbon gases.

Since its approval and publication, the legislative context that frames the PM EEGO has undergone significant changes, namely the extension of the EEGO's activity to the emission of GOs for the production of renewable and low-carbon gases.

Additionally, the experience of implementing the activity of the EEGO, together with the need to integrate it with the electricity labelling rules published by ERSE and with the systems of the Association of Issuing Bodies (AIB), and the legal, regulatory and normative changes that occurred after it was drawn up, justified the revision and publication of a new PM EEGO, through Directive no. 17/2023, of 31 August.

The structure of the new PM EEGO is based on a framework of autonomous procedures, which includes rules on GO issuing for renewable and low-carbon gases, one of the justifying pillars of the revision, as well

as specific rules for systematising the EEGO's reporting of information to the market and to ERSE, based on a framework of auditability by the EEGO itself.

3.2.2 RETAIL MARKET

2023 was marked by a significant reduction in electricity prices in the wholesale markets, compared to 2022, despite the high volatility observed. This price improvement contributed to the reinforcement of free retail market penetration, both in terms of consumption and number of customers.

A set of structural measures, such as the extinction of regulated tariffs and the adoption of transitory regulated tariffs, the adoption of hedging mechanisms by suppliers and the stronger transparency level required to suppliers when communicating to final customers have allowed for the entrance of new market suppliers. As such, the higher stability in retail electricity markets, compared to 2022, brought an increase in the number of suppliers.

Hence, at the end of 2023, there were 34 market suppliers in the market, 32 of which supplying normal low voltage (BTN) customers, which means an increase of 3 suppliers compared to 2022.

The level of penetration in the free market either remained stable or increased, both in terms of consumption and number of customers, for all customer segments. The segment with lowest penetration, normal low voltage, increased its penetration from 85% in 2022 to 86% in 2023. The supplier switching rate rose to 17% in customer terms, up by 1 pp, and to almost 25% in consumption terms which meant an increase of almost 2 pp.

3.2.2.1 MONITORING THE PRICE LEVEL, TRANSPARENCY LEVEL AND THE LEVEL AND EFFECTIVENESS OF MARKET OPENING AND COMPETITION

METHODOLOGY FOR MONITORING REFERENCE PRICES AND AVERAGE PRICES CHARGED IN THE RETAIL MARKET

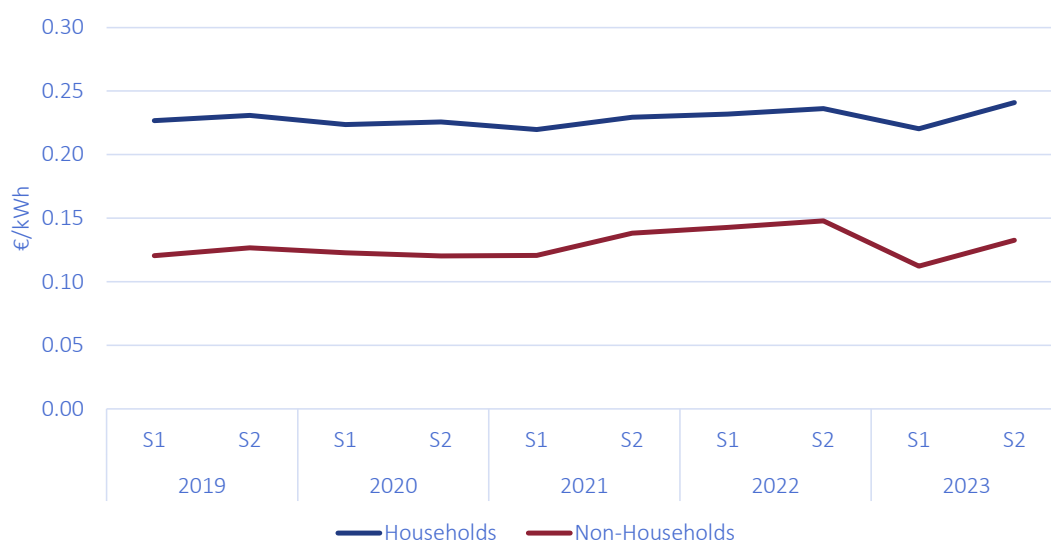
According to ERSE's legal competences regarding electricity market monitoring and its position as the information focal point for consumers and other agents regarding the prices applied, ERSE receives

information from suppliers on actual prices charged to consumers in the retail market, as well as updated information on the reference prices they offer or expect to offer for all LV electricity supply⁷⁴.

The information on the average prices applied, reported quarterly, supports ERSE in its functions of monitoring and supervising the retail electricity market, also serving as an information tool for the dissemination of average prices charged, being used by official statistical data bodies (National Institute of Statistics - INE at national level, or Eurostat at European level, for example).

Figure 3-39 highlights the evolution of electricity average prices both for household consumers and non-household consumers. The energy price depends on several different supply and demand conditions, the national energy mix, diversification of imports, network costs, environment protection costs, severe weather conditions or levels of taxes and levies. It is worth noting that the prices presented in this figure include VAT, taxes and other levies for household consumers. For non-household consumers, VAT is excluded.

Figure 3-39 – Evolution of electricity average prices for household consumers (with VAT, taxes and other levies) and non-household consumers (without VAT)



Source: Eurostat, ERSE

⁷⁴ Under the terms of [Order no. 18637/2010](#), of 15 December. In September 2023, ERSE began revising this Order through its Consultation of Interested Parties No. 7/2023, which ended in 2024.

Reference prices are the set of tariffs, tariff options and corresponding prices and indexes per billing variable offered by suppliers to their customers, as well as the conditions for applying the tariffs, namely consumption characteristics, contract duration and price revision conditions. Reference prices constitute the supplier's basic standard offer, which does not inhibit the application of differentiated contractual conditions such as discounts or other promotional campaigns. This information must be sent on an annual basis and whenever there is a change in prices or contractual conditions.

ERSE incorporates information on electricity offers on its comparison website and other tools which support consumers in their decision-making⁷⁵; which are described in the following section dedicated to transparency. Since the second quarter of 2017, these tools were complemented with the publication of quarterly newsletters on reference market prices in StLV⁷⁶.

The analysis of standard offers sent by suppliers shows that, in the last quarter of 2023, for the representative household customers⁷⁷, there were 21 suppliers on the market, with 239 offers (exclusively) of electricity and 150 integrated offers of electricity and natural gas (dual), totalling 389 commercial offers, with an increase in the number of suppliers (+3) and an increase in the number of offers compared to the last quarter of 2022 (+113).

In the last quarter of 2023, the electricity commercial offer with the lowest monthly bill was € 69.91/month, corresponding to a 24% discount and a monthly saving of € 22.52 compared to the regulated tariff. For dual commercial offers (electricity and natural gas), the most competitive commercial offer was € 114.16/month.

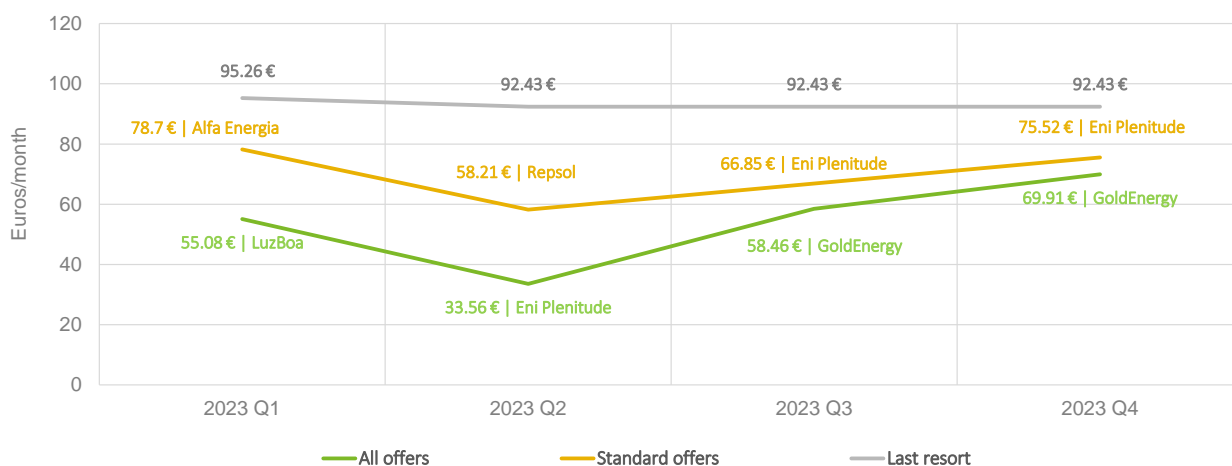
Based on all commercial electricity offers, Figure 3-40 shows that the differential between the best offer and the Regulated Tariff increased significantly from the 1st to the 2nd quarter of 2023. However, in the 3rd and 4th quarters of 2023, there was a significant reduction in this gap. In the 4th quarter of 2023, the difference between the best offer and the Regulated Market offer was 22.52 euros/month for type 2 consumers, based on all commercial offers. Throughout 2023, the minimum value standard offer was always more competitive than the Regulated Market tariff for type 2 consumers.

⁷⁵ See <https://www.erse.pt/simuladores/precos-de-energia/>.

⁷⁶ See in <https://www.erse.pt/biblioteca/atos-e-documentos-da-erse/?tipologia=----+Ofertas+Comerciais&setor=Eletricidade&ano=&descricao>.

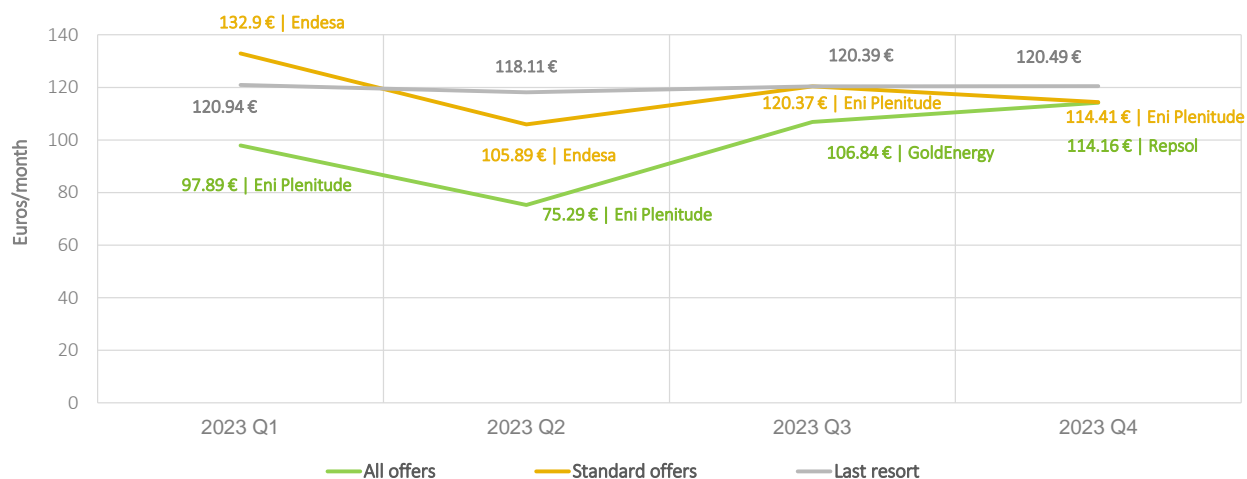
⁷⁷ In units of energy. Corresponds to type 2 consumer with an annual consumption of 5000 kWh/year of which 40% in off peak period, and a capacity of 6.9 kVA.

Figure 3-40 – Monthly billing of the most competitive electricity offer for type 2 consumer in 2023



With regard to dual offers, Figure 3-41 shows that, in the 1st quarter of 2023, the minimum value standard offer was higher than the Regulated Market tariff for type 2 consumers. From the 2nd quarter of 2023 onwards, the standard offer was more competitively priced than the Regulated Tariff for type 2 consumers.

Figure 3-41 – Monthly billing of the most competitive electricity dual offer for type 2 consumer in 2023



Source: ERSE data

Prices shown include applicable taxes and fees, except the Energy and Geology tax for electricity (DGEG tax) and the underground occupancy tax for natural gas. In addition, the analysis carried out includes all commercial offers, i.e. in addition to standard offers (without any restrictions), it includes conditional offers (with contractual conditions that affect the subscription to the general public, such as offers that require

the establishment of partnerships with other institutions or offers that require compliance with other conditions); loyalty offers (requiring consumers to stay for a previously established period, with penalties in the event of early termination of the contract); and indexed offers (offers with price indexing mechanisms to wholesale energy markets). Commercial offers with mandatory additional services are not considered.

TRANSPARENCY

ERSE continued its efforts to provide information to electricity consumers on market reference prices, as well as IT tools to support consumers in the choice of supplier. In this regard, ERSE makes available on its website the following simulators, which provide objective information to electricity consumers to help them make their choices, in a reasoned way, in particular as regards choosing the best offer on the market:

- Price comparison tool for StLV supply in mainland Portugal⁷⁸
- Simulation of contracted capacity⁷⁹
- Electricity labelling simulator⁸⁰

Since August 2022, ERSE has made available an interactive list of "Prices of Commercial Energy Offers on the market"⁸¹, which allows you to identify the best offer on the market and monitor the constant change in prices and conditions of electricity and natural gas offers.

This tool allows access to all prices of commercial offers, complementing the information provided through ERSE's price comparison tool. In addition, ERSE has updated the price comparison tool as a result of the amendment to Law 19/2022 of 21 October⁸², which determines the reduction of VAT on the supply of electricity, scheduled to last until 31 December 2024⁸³.

⁷⁸ Available at <https://www.erse.pt/simuladores/precos-de-energia/> (Portuguese only).

⁷⁹ Available at <https://www.erse.pt/simuladores/potencia-contratada/> (Portuguese only).

⁸⁰ Available at <https://www.erse.pt/simuladores/rotulagem/>.

⁸¹ Available at <https://www.erse.pt/simuladores/lista-de-precos-de-ofertas-comerciais/>.

⁸² Pursuant to Law no. 19/2022, of 21 October, since 1 October 2022, the reduced VAT rate (6%) applies to the variable part of the electricity bill for the first 100 kWh or 150 kWh (for families with 5 or more members), for the 30-day period, for contracted powers up to 6.90 kVA.

⁸³ Under the terms of Article 285 of Law no. 82/2023, of 29 December, which approves the Portuguese State Budget for 2024.

In line with a greater critical awareness of consumers in terms of environmental sustainability, ERSE makes available on its website the electricity labelling simulator which allows consumers to be assisted in the process of contracting energy supply based on information on the energy sources used in the production of electricity consumed, as well as the respective associated environmental impacts. In addition, it allows commercial offers to be ranked by their total emissions associated with billed consumption, so that consumers can check which offers have the least impact in terms of CO₂ emissions.

In order to ensure the transparency of information available from suppliers to consumers, ERSE also evaluates whether the former disclose on their websites the offers they are applying in the market, both in terms of prices and commercial conditions, and if these are in line with the reference price data sent to ERSE in the context of monitoring. In situations where there are discrepancies or gaps, ERSE reserves the right to refuse publication of the commercial offers in its price comparison tool, until the issues identified are resolved.

In addition to the simulator and the list of "Prices of commercial energy offers on the market", ERSE makes available on its website, in an open and up-to-date format, all the information on reference prices and other contractual conditions that serve as the basis for the operation of the simulator for comparing LV offers, with the aim of guaranteeing access to information for all interested parties.

ERSE also provides a social tariff calculator⁸⁴. This is an instrument that allows social tariff beneficiaries to understand and check social tariff discounts on electricity bills. This calculator is updated periodically with the prices of the tariffs published by ERSE.

Considering the increase in the number of offers available to customers in StLV, ERSE devised a mechanism to provide consumers with more effective information, with the aim of enabling them to make informed choices. Therefore, in 2015 ERSE approved⁸⁵ rules requiring suppliers to disclose the content of pre-contractual and of contractual information to electricity consumers in mainland Portugal, thus harmonising them through a standardised contractual sheet. The standardised contractual sheet is a measure that ERSE believes enables the effective promotion of competition, facilitating the comparability of offers available in the market.

⁸⁴ Available since 2017, at <https://www.erse.pt/media/0t1f42hc/desconto-tarifa-social-2023-eletricidade.xlsx>.

⁸⁵ [Directive no. 6/2015](#), of 27 April (Portuguese only).

Within the scope of the equivalent regime⁸⁶, suppliers are obliged to present in the client's invoice the value of the difference between the supplier's tariff and the equivalent tariff under the transitional or regulated tariffs regime. If the transitional or regulated tariff presents a lower price than the supplier's price, the consumer⁸⁷ may, at any time, end the supply contract with the supplier and switch to the SOLR or another supplier that has the same prices as the transitional or regulated tariffs⁸⁸.

In regulatory terms, suppliers with more than five thousand customers⁸⁹ are still obliged to advertise⁹⁰ their commercial offers, as well as the general conditions of contracts for low voltage customers. Additionally, when expressly requested, the supplier must submit a proposal for the supply of electricity within 8 business days for LV customers, and within 12 business days for all other customers, from the date on which the request was made by the customer.

With the revision of the RRC, it is now compulsory for suppliers with more than 50 000 customers to offer indexed tariffs, while suppliers with more than 200 000 customers are now obliged to offer dynamic tariffs⁹¹.

Rules are also in force concerning the information included in the invoices sent to customers, namely information regarding the cost of network access tariffs and CIEG⁹² as well as labelling of electricity⁹³.

Also, with regard to electricity bills, electricity suppliers continue to be obliged⁹⁴ to inform StLV customers of the preferred date or dates for the communication of meter readings, in order to improve the effectiveness of that communication and allow customers to be billed without the use of consumption estimates.

⁸⁶ Approved by [Law no. 105/2017, of 30 August](#) and [Governmental Decree no 348/2017, of 14 November](#).

⁸⁷ Applicable to natural or legal persons who purchase electricity for their own consumption, with a contracted power up to 41.4 kVA.

⁸⁸ The content and form of information provided to consumers regarding the exercise of the equivalent regime was approved by ERSE through [Directive no. 1/2018](#), of 3 January.

⁸⁹

Under Article 378, n° 3 of the [RRC](#), "in the case of suppliers with a number of customers equal to or greater than 5,000, it is presumed that their supply activity covers all types of electricity supply".

⁹⁰ Through the means of communication they make available, in particular on their websites.

⁹¹ As set out in Article 15(2) and (3) of the RRC.

⁹² Articles 51 and 7 of Annex I in the [RRC](#) (Portuguese only).

⁹³ Pursuant to Article 57 of the RRC.

⁹⁴ [Directive no. 14/2016](#), of 26 July, by which ERSE approved additional obligations applicable to electricity suppliers.

Rules for customers to access information on electricity consumption are regulated by ERSE under the Measurement, Reading and Data Availability Guide⁹⁵ and, since 2019, in the Code on Smart Grid Services, as regards StLV installations⁹⁶. With regard to metering rules, EHV, HV, MV and SpLV facilities are equipped with remote metering systems (telemetry), with daily collection of four-hourly records.

Decree Law no. 15/2022, of 14 January, provides that, by the end of 2024, all customers in mainland Portugal will have smart meters on their premises. In this context, the RRC also determined the end of the use of estimates for customers integrated into smart grids, since these installations collect daily (remote) readings and quarter-hourly records.

The Government approved the schedule for the installation of smart meters and their integration into smart grid infrastructures by Order 14064/2022 of 6 December⁹⁷ for distribution network operators in mainland Portugal, following a proposal from ERSE.

The main services of smart grids include, for example, invoices based on real consumption, without estimates, real daily reading of the consumption of each customer, as well as access to real consumption data, with greater frequency and greater discrimination, through electronic means, or the provision of services remotely (e.g. change of contracted power, conclusion and termination of contracts).

In facilities connected at StLV without a smart meter or not integrated into a smart grid, the reading must be collected locally, in 92% of cases, at intervals of no more than 96 days⁹⁸. The DSO is obliged to provide a toll-free telephone assistance service to all its customers so they can submit their own readings⁹⁹. The meter readings provided by the customer and by the DSO have the same legal value for billing purposes.

EFFECTIVENESS OF COMPETITION

The liberalisation of the electricity sector in mainland Portugal has progressed gradually, despite the energy crisis which emerged in late 2021. The process of phasing out regulated tariffs was extended to include all

⁹⁵ [Directive no. 5/2016, of 26 February](#) (Portuguese only).

⁹⁶ Approved by Regulation No. 610/2019 of 2 August 2019.

⁹⁷ Available at <https://dre.pt/dre/detalhe/despacho/14064-2022-204338646>.

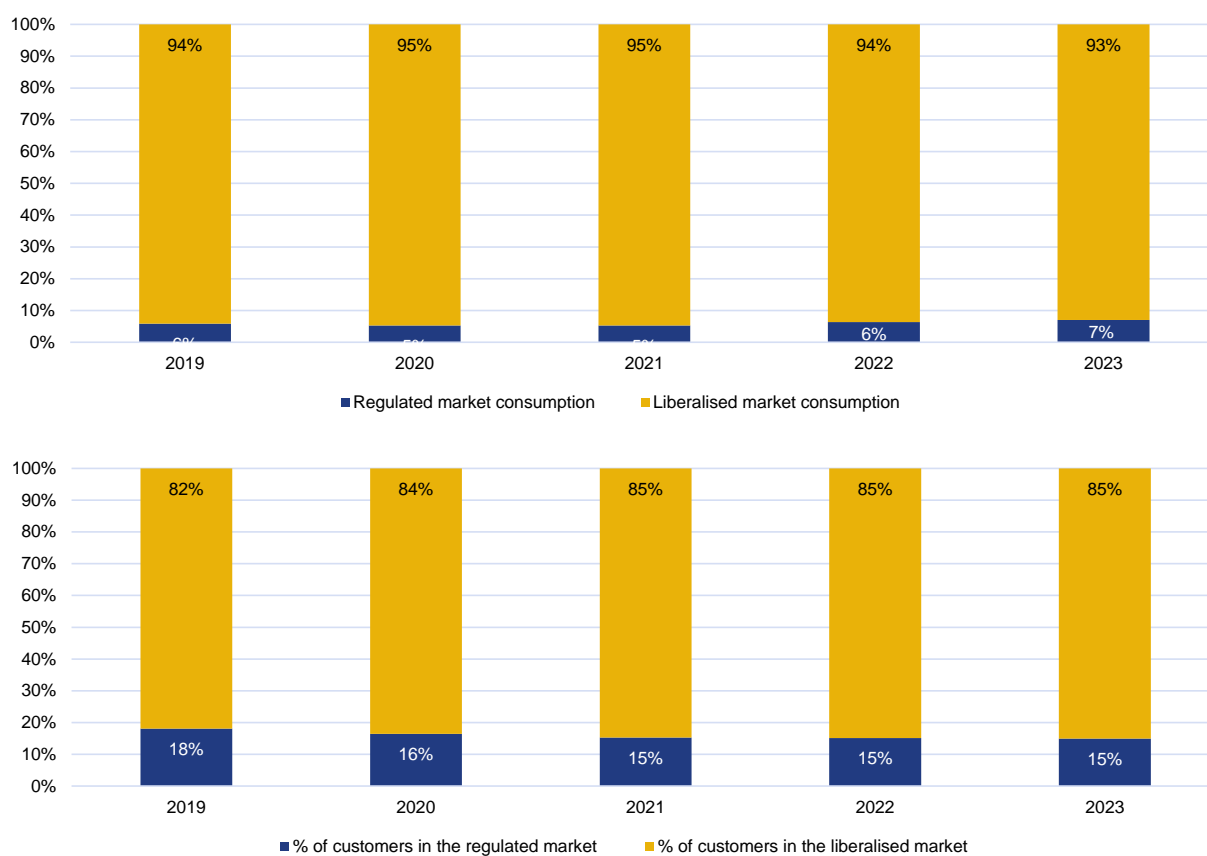
⁹⁸ Under the terms of the Quality of Service Regulation, Article 86, the obligation to read the metering equipment is realised through a general indicator, calculated as the ratio between the number of local readings with an interval from the previous local reading of less than or equal to 96 days and the total number of local readings. The standard set for this indicator is 92%.

⁹⁹ Under the terms of Article 35 of the [Electricity and Natural Gas Quality of Service Code](#) (RQS).

clients in January 2013, including household customers, despite successive deadline extensions. This process has contributed to alerting customers to the need to opt for a supply in the liberalised market.

The evolution of consumption and the number of customers in the liberalised electricity market in mainland Portugal between 2019 and 2023 can be seen in Figure 3-42.

Figure 3-42 – Breakdown of consumption and number of customers in the regulated and the liberalised electricity markets, 2019 to 2023



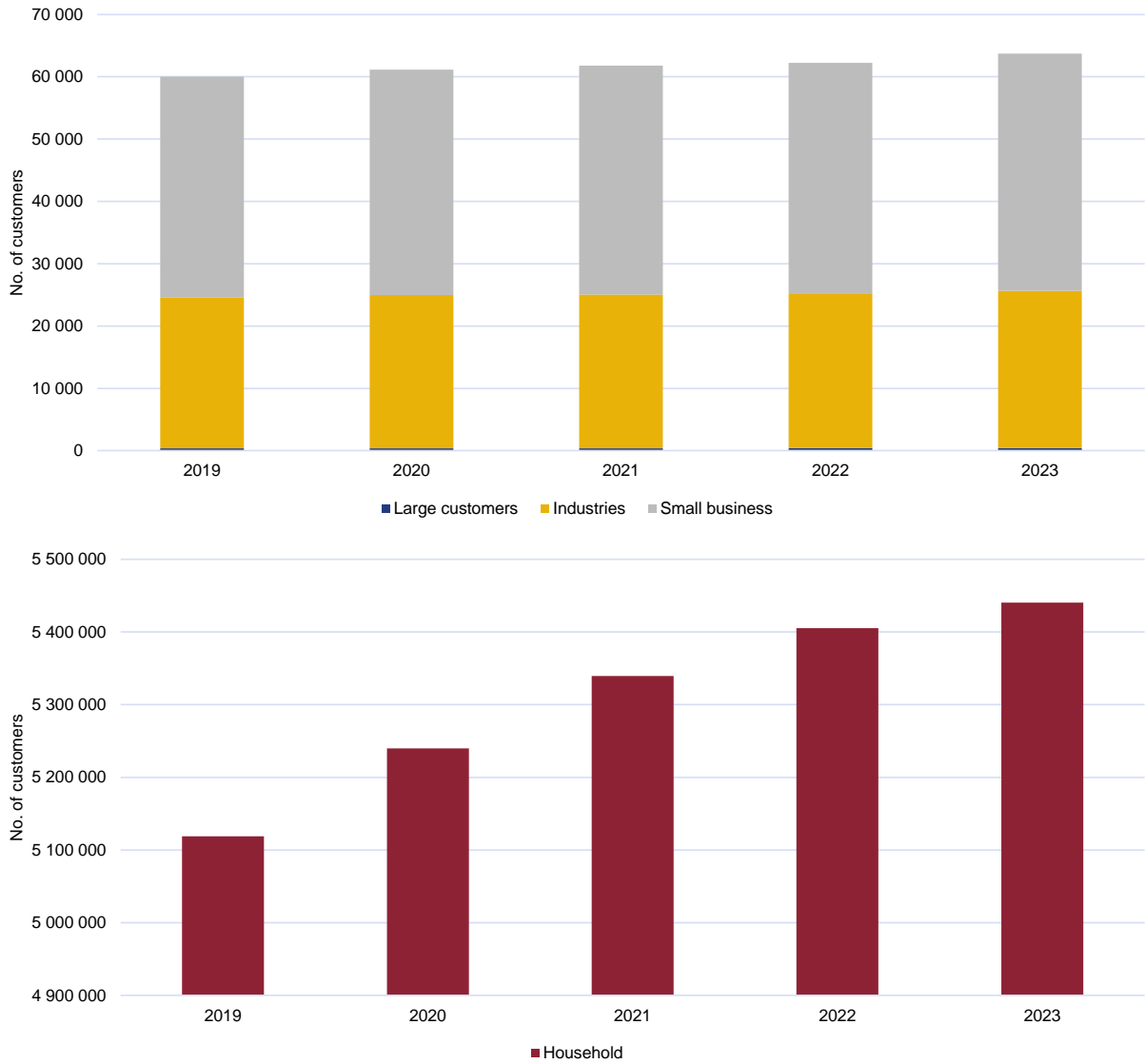
Source: OLMC data

In a first phase, the phasing out of regulated tariffs resulted in an increase in the size of the liberalised market. However, and despite the adverse situation experienced in 2023, the liberalised market maintained the consolidation acquired in previous years. At the end of 2023, market consumption represented around 93% of total consumption.

Figure 3-43 shows that the number of customers in the liberalised market has risen in all segments compared to 2022.

In 2023, three of the non-residential segments – large customers (EHV¹⁰⁰ and HV), industrial customers (MV) and small businesses (SpLV) – continued to experience growth between 1% and 3% in the liberalised market.

Figure 3-43 – Evolution of the liberalised electricity market in mainland Portugal, 2019 to 2023



Source: OLMC data

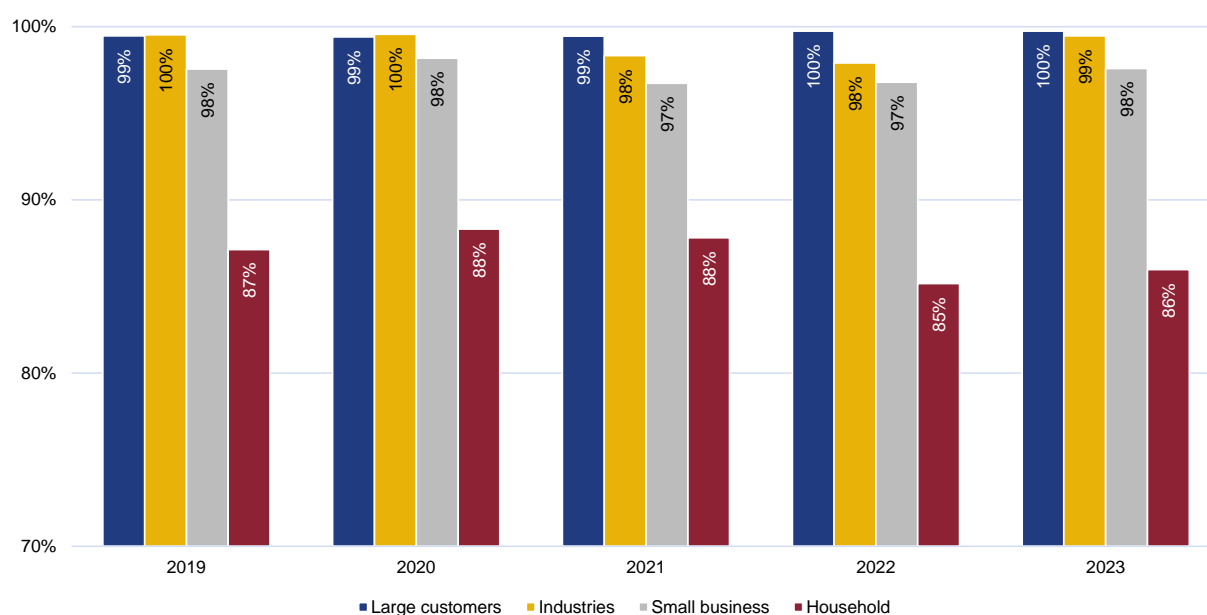
¹⁰⁰ All EHV customers have been in the liberalised market since July 2013.

The level of consumption associated with each customer segment of the liberalised market is shown in Figure 3-44. In 2023, almost all of the consumption by large customers and industrial customers was ensured by market suppliers.

As regards the number of household customers, and despite the fact that this customer segment still has a lower penetration in the liberalised market, and had an 1 p.p. increase in the degree of penetration in 2023, compared to 2022, it should be noted that around 86% of the customers in this segment were in the liberalised market.

In 2023, there was a slight increase in the penetration of industrial, small businesses and residential customers in the liberalised market.

Figure 3-44 – Penetration of the liberalised market by customer segment, 2019 to 2023

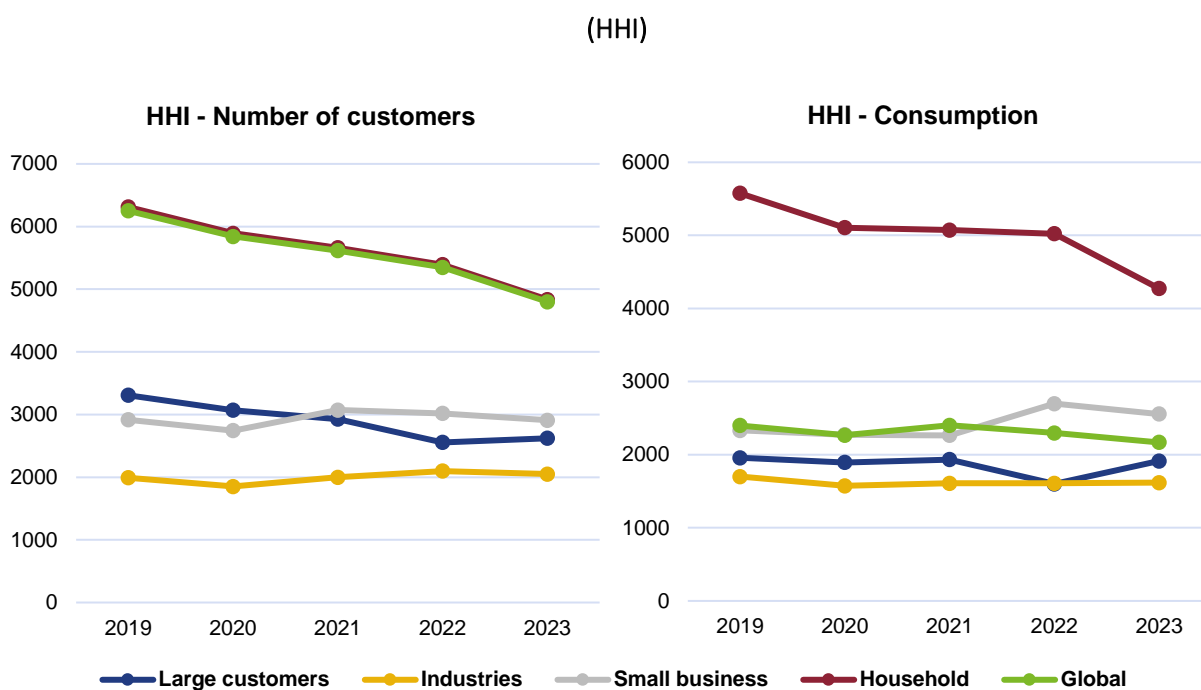


Source: OLMC data

In the liberalised market, an analysis by segment indicates that, in 2023, the large and industrial customer segments are the most competitive of all, both in number of customers and consumption with the lowest HHI levels, below 2,000 in these segments. The household customer segment is the one where the highest market concentration is observed.

Despite the growth of the liberalised market, overall business concentration remained high in 2023, mainly due to the concentration in the household segment. However, since 2019, a decreasing trend of the HHI indicator in terms of number of customers, as shown in Figure 3-45.

Figure 3-45 – Evolution of market concentration in number of customers and consumption, 2019 to 2023

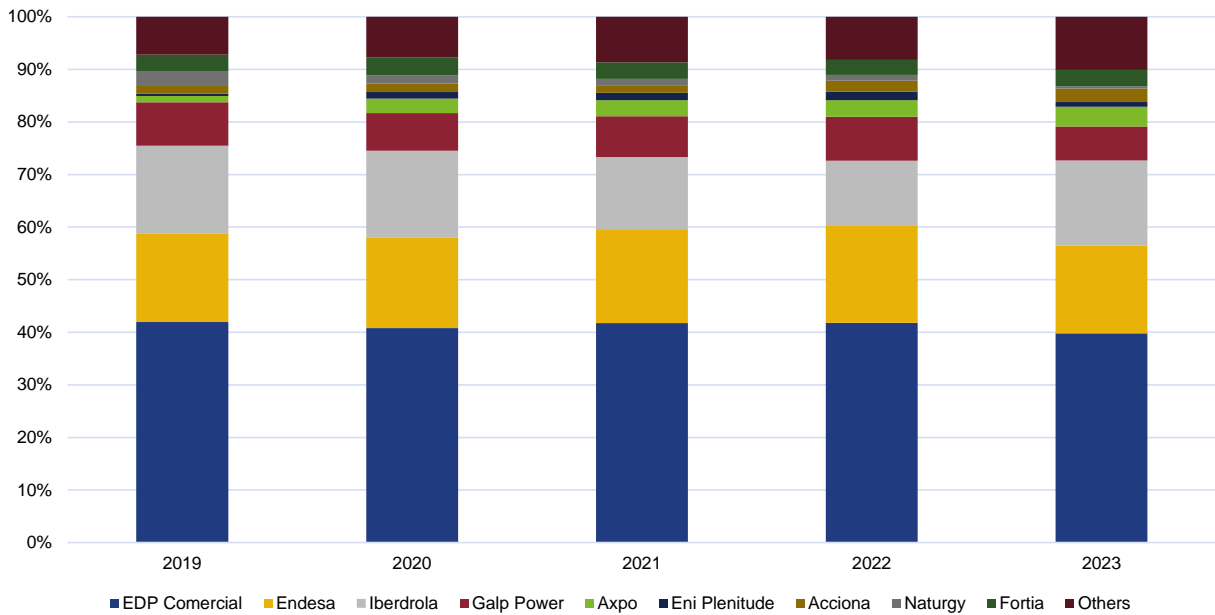


Source: OLMC data

Each supplier's commercial focus is reflected in the evolution of market shares, in terms of consumption and number of customers, by segment. The high market share of EDP Comercial, the main actor in the electricity market, mainly in the household segment, is the factor that most contributes to this situation – as the liberalised market supplier. This supplier represented, in 2023, around 40% of supplies on the market in the last year, as shown in Figure 3-46.

Even so, it should be noted that EDP Comercial lost 5 p.p. market share, when compared to the share it held in 2019.

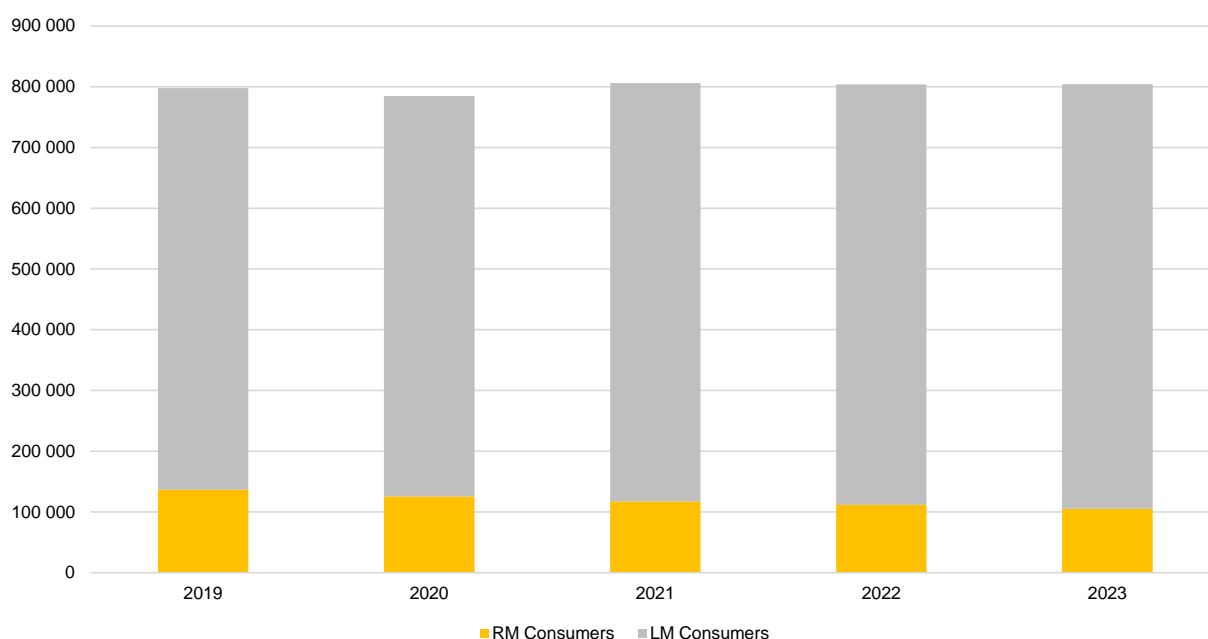
Figure 3-46 – Supply structure in the liberalised market by supplier, 2019 to 2023



Source: OLMC data

At the end of 2023, 804 309 consumers in the electricity sector were covered by social tariffs, 105 243 in the regulated market and 699 066 in the liberalised market. Globally, 13.1% of electricity consumers in mainland Portugal were on the social tariff, which in 2014 was less than 50 000 since in that year the social tariff was not yet automatically attributed. This evolution in the number of customers covered by the social tariff is shown in Figure 3-47.

Figure 3-47 – Number of consumers on social tariffs, electricity sector, 2019 a 2023



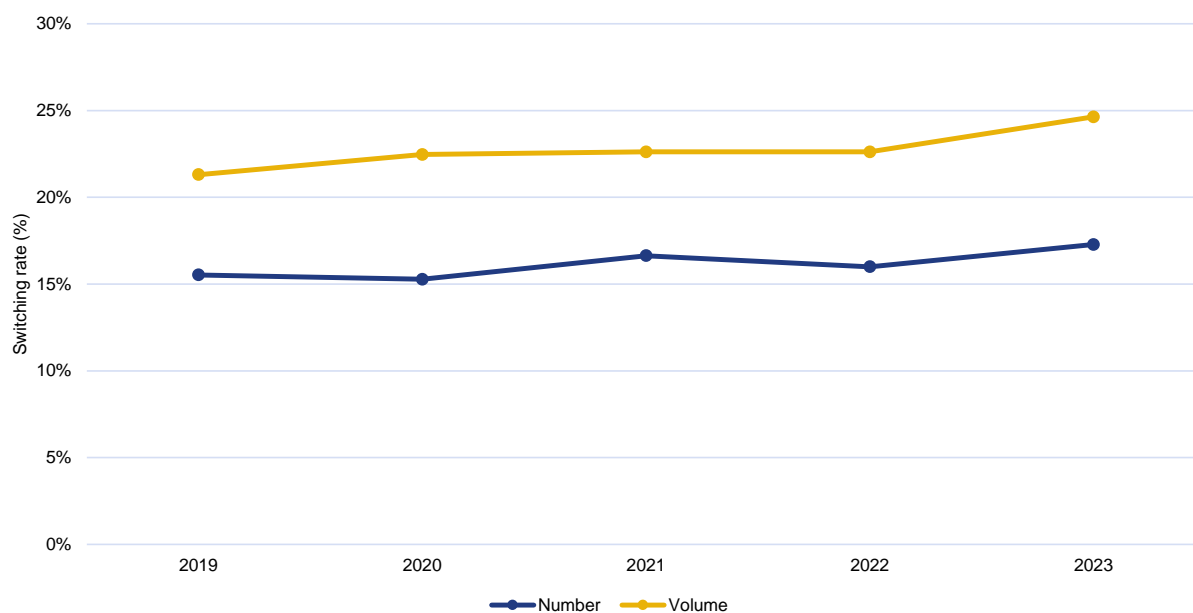
Note: LM - liberalised market; RM - regulated market

Source: Suppliers' data

Despite a downward trend, supplier switching rates¹⁰¹ were still significant: in 2023, approximately 17% of electricity consumers switched supplier, as shown in Figure 3-48; consistent growth has been observed since 2019, both in terms of the number of customers and consumption.

¹⁰¹ The supplier switching rates by number of customers are calculated by the sum of direct market entries; switches from the regulated market to the liberalised market; switches within the liberalised market; and switches from the liberalised market to the regulated market during 2022 to be divided by the average number of customers in mainland Portugal during 2023. The supplier switching rates by consumption are calculated in a similar way, that is, by the consumption associated with the sum of direct market entries from the regulated market to the liberalised market; switches within the liberalised market; and switches from the liberalised market to the regulated market during 2023 to be divided by the average annual consumption in mainland Portugal during this year.

Figure 3-48 – Supplier switching, 2019 to 2023



Source: OLMC data

An analysis of the evolution of the retail market is available on the ERSE website in the form of a monthly report¹⁰², which provides information regarding issues linked to competitive pressure on the market and on each of its segments.

3.2.2.2 RECOMMENDATIONS ON SUPPLY PRICES, INVESTIGATIONS AND MEASURES TO PROMOTE EFFECTIVE COMPETITION

RECOMMENDATIONS FOR SUPPLY PRICES

In the course of 2023, ERSE did not publish recommendations on the conformity of supply prices in accordance with Article 59 of Directive (EU) 2019/944, of 5 June, within the framework of the free market.

With regard to the regulated market, ERSE approved the tariffs and prices for electricity by means of [Directive 3/2023 of 11 January](#). Subsequently, through [Directive 9/2023](#), of 3 April, the first update was undertaken of the Energy Tariff applicable to the SOLR. This update was justified due to the high volatility

¹⁰²<https://www.erse.pt/biblioteca/atos-e-documentos-da-erse/?tipologia=----+Mercado+Liberalizado+-+Eletricidade&setor=&ano=&descricao=>

of energy prices in MIBEL, with an impact on the SOLR's cost of supply for the whole of 2023, and resulted in the Energy tariff being updated by -5 EUR/MWh, with effect from 1 April 2023.

In July 2023, [Directive 14/2023](#) of 26 July was published, approving, under Article 217 of the Electricity Tariffs Code (RT), the exceptional setting of electricity tariffs and prices, with effect from 1 July 2023, impacting the prices of Network Access tariffs.

The exceptional setting of the Energy tariff and the Global Use of the System tariff and the other tariffs that incorporate these two tariffs resulted from the sharp reduction in electricity prices on the wholesale markets in the first few months of 2023, not fully provided for in the income to be recovered by the tariffs in force. The exceptional setting of tariffs for the period from July to December 2023 was essential to ensure tariff stability in the context of volatility and uncertainty in the evolution of prices on the electricity and natural gas wholesale markets. The reduction in prices on the wholesale electricity markets had a strong impact on the allowed income of some regulated activities and caused significant deviations from the values in force at the time.

It should be noted that the mechanism for updating the energy tariff, provided for in Article 156 of ERSE's electricity Tariffs Code, provides that, in the event of deviations greater than or equal to EUR 10/MWh in the forecast of the average price of the SOLR, for the whole year to which the tariffs refer, an update of EUR 5/MWh must occur in the same direction.

It is important to highlight that the transitional regime of regulated tariffs for the supply of electricity to for end-customers in StLV remained in force, with the transitional tariffs for SpLV having ended on 31 December 2022¹⁰³.

In situations where the SOLR acts to ensure supplies on a supplementary basis, namely in places where there is no supply from market electricity suppliers and in situations where a supplier has been prevented from carrying out the activity of electricity supplier, supplementary tariffs are applicable, under the terms of Article 32 of ERSE's electricity Tariffs Code.

¹⁰³ In 2023, under the terms of Decree Law no. 15/2022 of 14 January, the transitional tariffs will only apply to StLV supplies, and the transitional tariffs for supply to final customers in EHV, HV, MV and SpLV are extinct.

MEASURES TO PROMOTE EFFECTIVE COMPETITION

As part of the implementation of the mechanism for adjusting electricity production costs, with repercussions on electricity price formation in MIBEL wholesale market benchmarks, the Portuguese and Spanish governments decided, with the approval of the European Commission¹⁰⁴, in the context of state aid rules, to extend the mechanism until the end of 2023¹⁰⁵. To this end, ERSE approved Directive 10/2023, of 11 April, which implemented the reporting of exemptions to the cost of the mechanism for the period of its extension. In addition to completing the necessary legal and regulatory framework, ERSE's regulatory action sought to ensure conditions of absolute equal treatment and transparency in the costs and benefits of the mechanism. In turn, the defence of such conditions of fairness and transparency are essential to the defence of a framework of effective competition in the national and Iberian electricity sector, seeking to minimise the possible distortions of competition that an administrative intervention may entail.

Also with regard to the mechanism for adjusting electricity production costs (which was previously reported to the European Commission as part of the assessment of state aid in the area of energy), in 2023 ERSE ensured the support required by the Government of Portugal in determining the value of the reported measure, to guarantee that it complies with the decision handed down by the European Commission on the effects of state aid.

In the context of regulatory development, ERSE approved Directive 18/2023 of 22 December, which implemented the Frequency Restoration Reserve Band market with Manual activation ("BmFRR"). The BmFRR is a service provided to the SEN to guarantee the regularity and continuity of electricity supply to all SEN customers, and the service is mobilised through market rules, approved in ERSE regulations (MPGGS), so that its overall cost is as low as possible for the SEN and its customers. The rules approved in Directive 18/2023, of 22 December, emphasised the principle of technological neutrality in the provision

¹⁰⁴ Communication from the European Commission 2023/C 203/14, published in the OJEU of 9 June 2023 (case no. SA.106096)

¹⁰⁵ In accordance with Decree Law no. 21-B/2023 of 30 March.

of the service and, as such, the extension of the conditions of competition in its provision by contracted entities, including on the demand side.

TRANSITIONAL REGIME FOR THE APPLICATION OF TARIFFS FOR END-CUSTOMERS BY THE SUPPLIER OF LAST RESORT

Since 1 January 2013¹⁰⁶, electricity tariffs for LV end-customers published by ERSE for mainland Portugal¹⁰⁷ have a transitional nature¹⁰⁸. In 2023, these tariffs applied exclusively StLV¹⁰⁹ supply delivered by the supplier of last resort. Transitional EHV, HV, MV and SpLV tariffs were abolished, given that the SOLR was no longer supplying to these voltage levels.

Transitional tariffs for end-customers in force from 1 January 2023 onwards were determined by the sum of network access tariffs, the transitional energy tariff and the regulated supply tariff, all approved by ERSE¹¹⁰.

REGULATORY DEVELOPMENTS

REVISION OF THE CODE ON COMMERCIAL RELATIONS FOR THE ELECTRICITY AND GAS SECTORS

On 28 March 2023, ERSE launched Public Consultation no. 113, which included the proposal to revise the RRC, with the aim of incorporating the changes to the organisation and operation of the SEN recommended by Decree Law no. 15/2022 of 14 January, as well as altering other aspects deemed necessary, and also the internal reorganisation of the code itself.

In order to meet the ambitious challenges posed to the electricity system, which will guide Portugal's energy policy in the coming years, ERSE has moved ahead with the aforementioned regulatory review process, taking as its motto a regulation that is easy to understand and implement, whose regulatory review proposal incorporated a set of changes relating to the following main topics: supplementary energy supply; extinction of transitional tariffs; contracting and aggregation modalities; aggregation of last resort; aspects

¹⁰⁶ Pursuant to [Decree Law no. 75/2012](#), of 26 March.

¹⁰⁷ Provisions related to the organised market are not applicable in the autonomous regions, as well as the provisions regarding the legal separation of the activities of electricity production, transport, distribution and supply, under the terms of the derogation foreseen in Article 66 of Directive 2019/944/CE, of the European Parliament and Council, of 5 June.

¹⁰⁸ For the other voltage levels (EHV, HV, MV and SpLV), [Decree Law no. 104/2010](#), of 29 September, in its current form, applies.

¹⁰⁹ In 2023, according to [Decree Law no. 15/2015, of 30 January](#), as amended.

¹¹⁰ Directive 3/2023 of 11 January, as amended by Directive 9/2023 and Directive 14/2023, available at <https://www.erse.pt/atividade/regulacao/tarifas-e-precos-eletricidade/>.

of the commercial relationship with customers; intermediation in commercialisation; commercial relationship of supplier and aggregator's switching logistics operator (OLMCA); unilateral amendment of the contract by the supplier; measurement, reading and provision of data; connections to the networks; obligation to provide LV reference prices and prices of regulated services.

In addition, and as a result of the comments received during the public consultation, a second set of issues were added to the procedure which, after due scrutiny, were considered relevant, namely: clarification of the security deposit regime; billing adjustments and frequency; interruptions due to an event attributable to the customer; metering at a voltage other than the supply voltage; commercial relationship of closed distribution networks; Technological Free Zones; pilot projects; connections to electricity sector networks; billing of contracted power between distribution network operators; conditions for establishing a connection to the gas network; contracted power and tariff options; billing of network access tariffs.

TARIFF DEFICIT

In line with Decree Law no. 165/2008 of 21 August, in 2009, the tariff adjustments made in 2007 and 2008 to the costs of electricity were deferred for a period of 15 years with effect from 2010, as was the extra cost of purchasing electricity from renewable generators with guaranteed revenue in 2009.

In 2011, a new possibility was introduced to pass on the cost differentials associated with the purchase of energy from renewable generators, based on a deferral of the portions which are passed on in the allowed revenues to be recovered through the tariffs of the following five years, through the publication of Decree Law No. 78/2011 of 20 June, more specifically Article 73-A.⁹

Decree Law no. 178/2015, of 27 August, amended the established inter-temporal transfer regime, extending its application until 31 December 2020, pursuant to no. 8 of Article 73-A. In 2020, this mechanism was amended by Decree Law no. 79/2020, of 1 October, allowing the intertemporal transfer of the recovery through tariffs of the cost difference with the purchase of energy from producers of electricity from endogenous renewable and non-renewable resources and cogeneration with guaranteed remuneration for a maximum period of five years, until 31 December 2025. It should be noted that Decree Law No 15/2022, of 14 January, extended the possibility of inter-temporal transfer to all CIEGs, regardless of their type.

The next table shows that 2022 and 2023 were the only recent years without extra costs for buying energy from producers with guaranteed remuneration.

The final outstanding balance in 2023 of the main items of the electricity sector's tariff deficit is presented in Table 3-12.

Table 3-12 – Tariff deficit, 2023

	Unid: 10 ³ EUR
	Outstanding debt in 2023 (10³ EUR)
Tariff deficit 2009	132 085
2020 SRG additional cost deferral	191 483
2021 SRG additional cost deferral	555 367
2022 SRG additional cost deferral	0
2023 SRG additional cost deferral	0
Total	878 935

3.3 SECURITY OF SUPPLY

Under the Portuguese legal framework, the government is responsible for security of supply in the SEN, and it has delegated responsibility for monitoring this to the DGEG¹¹¹. However, ERSE monitors the evolution of installed capacity and electricity demand, which is discussed below.

The following points refer to the various aspects of security of supply.

CAPACITY MECHANISM PAYMENT – INCENTIVE FOR INVESTMENT (DMC)

The capacity mechanism payment was set out by Order No. 251/2012, of 20 August, with amendments by Law No. 42/2016, 28 December, which suspended the availability of the incentive for security reserve for thermal producers who are not in any of the situations outlined in Article 3 of Order No. 251/2012.

The allocation of incentives for investments related to capacity mechanism payments was applicable to:

- Hydropower plants that were granted a license between the publication of Decree Law No. 264/2007, of 24 July, and of Order No. 251/2012, of 20 August, or those hydropower plants whose agreements fall within the scope of the implementation of the National Programme for Plants with

¹¹¹ In accordance with Decree Law no 15/2022 of 14 January.

Significant Hydroelectric Potential (PNBEPH), in compliance with Article 3 of Decree Law No. 182/2008, of 4 September, and that were granted a license by 31 December 2013.

- Reversible hydropower plants whose installed capacity has been increased and were granted a generation license by 21 August 2012.

Order No. 233/2020, of 2 October, revoked Order No. 251/2012, of 20 August, regarding incentives for 2020 for hydropower producers whose eligibility was acknowledged until 2019 and whose tariff impact would occur during 2021. The following hydropower plants were affected: Alqueva II, Ribeiradio-Ermida, Baixo Sabor (upstream and downstream), Salamonde II and Venda Nova III (Frades II).

The transitional arrangement established by Order No. 233/2020 sets out that the incentives for investment will still be paid until 2021 for producers whose eligibility was acknowledged during 2020. The Foz Tua hydro plant can be found under this arrangement as its eligibility was recognised by a dispatch issued by the Deputy Secretary of State and of Energy on 17 September 2020. The amount for 2019, totally 3.1 million euros, was approved in April 2021, adding €9 100 in interest, which was reflected in the tariffs in 2022.

Additionally, an exception was introduced in the transitory regime foreseen in Portaria no. 233/2020, of 2 October, for cases in which the capacity guarantee incentive is contractually guaranteed.

The new Gouvães, Daivões e Alto Tâmega hydropower plants fall under this disposition. Therefore, the impact of the measures will only be felt in the future, following recognition of these producers by the member of government responsible for energy.

Thus, to date, ERSE has not yet been informed of the approval of the annual amounts of the capacity mechanism payments, nor of the recognition of eligibility to benefit from this incentive, under the terms and for the purposes of Article 16 of Government Order no. 251/2012, of 20 August, applicable by virtue of Government Order no. 233/2020, of 2 October, rectified under the terms of Declaration of Rectification no. 42/2020, of 30 October.

SECURITY RESERVE

Decree Law no. 15/2022, of 14 January, in its current wording, provides for the creation of a mechanism for the allocation of incentives for reserve capacity made available to the national electricity system by

power producers. The objective is to ensure an adequate level of electricity demand coverage and an adequate management of power plant availability.

Through Order No. 41/2017, of 27 January, and in accordance with the guidance of Law No. 42/2016, of 28 December, which approved the State Budget for 2017, an auction mechanism was implemented, remunerating exclusively the availability services provided in the market to ensure the security reserve for the national electricity system.

In relation to 2023, the security reserve auction, under Government Order No. 41/2017, did not take place and the mechanism was suspended, as the Portuguese Government did not receive the unequivocal pronouncement of the European Commission on the compatibility of this security reserve mechanism with European provisions concerning state aid to the energy sector¹¹².

Thus, for 2023 availability contracts were not concluded for the security reserve regime and, consequently, the national electricity system incurred no cost.

Regulation Reserve Band

Taking into consideration the profound changes that have been occurring in the SEN, namely the decommissioning of coal-fired power plants and the end of the interruptibility service, the TSO signalled, under the provisions of Regulation (EU) 2017/2195 of the Commission Regulation (EU) 2017/2195 of 23 November setting out guidelines on balancing the electricity system, the need to supplement the SEN operational reserve with regulation reserve band, to be supplied to the system by consumers entitled to do so, in order to safeguard security of supply.

To this end, ERSE published Directive no. 16/2021, of 18 November, following consultation with stakeholders, which approves the implementation of the regulation reserve band, thus contributing to ensuring regularity and stability in the supply of electricity in the SEN.

The operation of the regulation reserve band market is carried out through a competitive auction, open to all electricity consumers duly qualified for this purpose. The following market agents are eligible to provide ancillary services in Extra High Voltage (EHV), High Voltage (HV) or Medium Voltage (MV).

¹¹² [Government Order No. 93/2018](#), of 3 April.

On 24 November 2022, the second competitive regulation reserve band auction was held for the 8760 hours of 2023, with a demand required by the transmission network operator of 800 MW/hour at a reserve price of 44 €/MW/hour, split into three independent and successive blocks: B₁ for 600 MW/hour; B₂ for 100 MW/hour and B₃ for 100 MW/hour.

Within the scope of the auction process, a capacity of 316.9 MW/hour relative to the regulation reserve band was adjudicated to 23 consumer installations, which corresponds to around 40% of the needs required by the TSO, at an equilibrium price of 44€/MW/hour.

Taking into account the quantities of BRR not awarded in the second auction, the third competitive BRR auction was called for the period between 1 February 1 and 31 December 2023 (corresponding to 8016 hours), with a demand requested by the overall SEN manager of 483 MW/hour, divided into three independent and successive blocks, B₁ of 283 MW/hour, B₂ of 100 MW/hour and B₃ of 100 MW/hour at a reserve price of 48 EUR/MW/hour.

As part of this last auction, no BRR power was awarded because no bids were submitted by qualified consumer installations.

Taking into account the information provided by the overall SEN manager to ERSE, with regard to the provision of the BRR service in 2023, an average value of 38.90 EUR/MW/hour was paid for the available capacity (around 88% of the unit value of the capacity awarded in the auction), with 944 activations having taken place in regulation reserve (tertiary), corresponding to a total volume of reserve mobilised upwards (demand downwards) of 4.87 GWh, at a weighted average price of 132.73 EUR/MWh.

FREQUENCY RESTORATION RESERVE WITH MANUAL ACTIVATION (BmFRR)

With a view to the adoption by the overall SEN manager (GGs) of standardised balancing products, namely the standardised mFRR product and its subsequent integration into the European mFRR contracting platform - the MARI platform - the need arose to revise the MPGGs, discontinuing the regulation reserve market and adapting the specific BRR product to a new specific mFRR Band product.

To this end, ERSE published Directive 18/2023, of 22 December, following consultation with interested parties, which approved the implementation of the mFRR band market, thus helping to ensure regularity and stability in the supply of electricity in the SEN.

The BmFRR service is contracted through an open competitive tender with technological neutrality open to demand-side market participants, storage units and generators that comply with the technical requirements and are connected to distribution (HV and MV) or transmission grids (EHV)

On 18 and 19 December 2023, the first BmFRR auction was tendered for the following products:

- BmFRR YEAR-2024, annual product for the 35 136 quarter hours (QH) of 2024, needs of 450 MW/QH as identified by the TSO with a reserve price of 12 EUR/MW/QH;
- BmFRR Q1-2024, quarterly product for the 8 732 quarter hours (QH) of the first quarter of 2024, needs of 200 MW/QH as identified by the TSO with a reserve price of 11 EUR/MW/QH;
- BmFRR JANUARY-2024, monthly product for the 2 976 quarter hours (QH) of January 2024, needs of 150 MW/QH as identified by the TSO with a reserve price of 10 EUR/MW/QH;
- BmFRR FEBRUARY-2024, monthly product for the 2 784 quarter hours (QH) of February 2024, needs of 150 MW/QH as identified by the TSO with a reserve price of 10 EUR/MW/QH
- BmFRR MARCH-2024, monthly product for the 2 972 quarter hours (QH) of February 2024, needs of 150 MW/QH as identified by the TSO with a reserve price of 10 EUR/MW/QH.

No âmbito do processo de leilão, resultou adjudicado:

The BmFRR auction results were:

- BmFRR YEAR-2024, 360,6 MW/QH, 21 consumer installations awarded, around 80% of the TSO's identified needs, at 12 EUR/MW/QH;
- BmFRR Q1-2024, 25 MW/QH, 3 consumer installations awarded, around 13% of the TSO's identified needs, at 11 EUR/MW/QH;
- BmFRR MARCH-2024, 6 MW/QH, 1 consumer installation awarded, around 4% of the TSOs identified needs, at 9.5 EUR/MW/QH.

There were no offers for the BmFRR JANUARY-2024 and BmFRR FEBRUARY-2024 products, thus no capacity was contracted.

3.3.1 MONITORING THE BALANCE BETWEEN SUPPLY AND DEMAND

The capacity margin, defined as the difference between the installed generation capacity and the maximum annual consumption peak, referred to the installed generation capacity, decreased in 2023, to 56%, compared to the value verified in 2022 (58%), as a result of an increase in the consumption peak and an increase in the total installed capacity. On the other hand, taking into account the increased penetration of renewable generation of intermittent sources, a decrease occurred in the percentage of dispatchable power plants in the total installed generation capacity¹¹³. The evolution of the installed capacity, the yearly peak load and the installed capacity of dispatchable and non-dispatchable power plants is presented in Table 3-13.

¹¹³ Concept associated to conventional power plants that control the availability of the primary resource. On the other hand, Article 31 of Decree Law 15/2022 of 14 January, establishes that are subject to control (forced to adjust the active power injected on RESP following an instruction from GGS) all power plants or storage facilities with an installed capacity higher than 1 MW, as well as the UPAC that foresee to inject surplus higher than 1 MVA.

Table 3-13 – Capacity margin of the national electricity system

	2022	2023	Change
	(MW)	(MW)	(%)
Total installed capacity	20 676	21 362	3.32%
Renewable capacity	16 187	16 900	4.40%
Non-Renewable	4 489	4 462	-0.60%
Maximum peak load	8 595	9 362	8.92%
Capacity margin	12 081	12 000	-0.67%
Capacity margin / Total installed capacity	58%	56%	
Dispatchable power plants	11 616	11 611	-0.04%
Non-Dispatchable power plants	9 060	9 751	7.63%
	2023	2022	Change
	(MW)	(MW)	(%)
Total installed capacity	21 362	20 676	3.32%
Renewable capacity	16 900	16 187	4.40%
Non-Renewable	4 462	4 489	-0.60%
Maximum peak load	9 362	8 595	8.92%
Capacity margin	12 000	12 081	-0.67%
Capacity margin / Total installed capacity	56%	58%	
Dispatchable power plants	11 611	11 616	-0.04%
Non-Dispatchable power plants	9 751	9 060	7.63%

Source: REN data.

Table 3-14 presents total electricity consumption and its supply sources.

Table 3-14 – Consumption supply

	2023	2022	Change
	(GWh)	(GWh)	(%)
Total generation	44 129	44 047	0%
Renewable generation	34 097	27 448	24%
Non-Renewable generation	10 032	16 599	-40%
Import balance	10 233	9 253	11%
Hydro Pump Consumption	-3 625	-2 937	23%
Total consumption	50 737	50 363	0.7%
	2023	2022	Change
	(GWh)	(GWh)	(%)
Total generation	44 129	44 047	0%
Renewable generation	34 097	27 448	24%
Non-Renewable generation	10 032	16 599	-40%
Import balance	10 233	9 253	11%
Hydro Pump Consumption	-3 625	-2 937	23%
Total consumption	50 737	50 363	0.7%

Source: REN data.

On the demand side, in 2023, total electricity consumption reached 50.74 TWh, with a 0.7% increase compared to 2022¹¹⁴.

Table 3-15 shows the evolution of consumption by voltage level, excluding losses.

¹¹⁴ Considering the production for self-consumption foreseen in 2023 (Source : [Estatísticas Rápidas das Renováveis da DGEG](#)), the gross electricity consumption has grown approximately 1.9%. A part of this production for self-consumption corresponds to an “invisible” consumption, as it does not use the electrical network.

Table 3-15 – Evolution of consumption by voltage level

(GWh)	2020	2021	2022	2023
Extra High Voltage (EHV)	2 461	2 282	2 242	2 368
High Voltage (HV)	6 792	6 826	6 862	6 677
Medium Voltage (MV)	13 916	14 416	14 898	14 701
Low Voltage (LV)	20 984	21 240	21 504	22 245
Total	44 153	44 764	45 505	45 991

Source: E-Redes

In 2023, hydrological conditions were average, with a hydrological index¹¹⁵ of 0.99, which represented a significant increase of this index compared to 2022 (dry year). Hydropower plants¹¹⁶ supplied 33% of electricity consumption, a higher value compared to the year before. The remaining renewable generation maintained an equivalent share to the previous year.

Non-renewable thermal power plants represented, in 2023, a quota of about 23%, smaller than the 38% recorded in 2022, with 22.5% of their generation coming from natural gas power plants and 0.5% coming from other non-renewable sources.

In 2023, net import cross-border balance was 10 233 GWh or 20.2% of total consumption, which represented a reinforcement of the previous year importing tendency.

Table 3-16 presents the percentage breakdown of electricity generation by primary source. Additionally, it is relevant to refer that the data on Table 3-16 does not include the consumption supplied by self-consumption, that reached in 2023 the estimated value of 1 470 GWh¹¹⁷, which represents 2.8% of national consumption.

¹¹⁵ Indicator quantifying the deviation of the total value of energy produced with hydro during a given period, relative to what would be produced under average hydrological conditions.

¹¹⁶ Including pumped hydro.

¹¹⁷ Considering the estimated production for self-consumption of 1 793 GWh in 2023 (Source : [Estatísticas Rápidas das Renováveis da DGEG](#)) and the surplus of 323 GWh (Source: DGEG and E-Redes)

Table 3-16 – Breakdown of generation, 2022 and 2023

	2022	2023
Renewable Generation	62%	77%
Hydro	19,6%	33,2%
Wind	29,4%	29,3%
Biomass	7,5%	6,6%
Solar	5,8%	8,2%
Non Renewable Generation	38%	23%
Coal	0,0%	0,0%
Natural Gas	37,2%	22,3%
Other	0,4%	0,4%

Source: REN data.

Table 3-17 illustrates the evolution of the annual peak demand and its variation in relation to the previous year. The peak demand reached its maximum value, 9 362 MW, on 26 January 2023. Compared to the historical maximum (2021 peak) this represents a decrease of 526 MW (5.31%).

Table 3-17 – Annual peak demand, 2019 to 2023

Year	Day	Peak (MW)	Variation (%)
2019	15-Jan	8 650	-1.64
2020	13-Jan	8 906	2.96
2021	12-Jan	9 888	11.03
2022	26-Jan	8 595	-13.08
2023	26-Jan	9 362	8.92

Year	Day	Peak (MW)	Variation (%)
2019	15-Jan	8 650	-1.64
2020	13-Jan	8 906	2.96
2021	12-Jan	9 888	11.03
2022	26-Jan	8 595	-13.08
2023	26-Jan	9 362	-13.08

Source: REN data

The evolution of the installed capacity at the end of each year is shown in Table 3-18. Not including the amount of 1 592 MW of installed capacity of production for self-consumption¹¹⁸. At the end of the year, the installed capacity was 21 363, distributed, in terms of capacity, in 70% of facilities connected to the RNT and the remaining 30% to the RND. The committed capacity is approximately 13 250 MW¹¹⁹.

Table 3-18 – Power generation capacity

	2023 (MW)	2022 (MW)	Change (MW)
Renewable power plants	16 901	16 186	715
Hydro	8 216	8 221	-5
Pumping	3 585	3 585	0
Wind	5 374	5 374	0
Biomass	700	700	0
of which CHP	345	345	0
Solar	2 611	1 891	720
Non-Renewable power plants	4 462	4 489	-27
Coal	0	0	0
Natural gas	4 434	4 461	-27
of which CHP	604	632	-28
Other	28	28	0
of which CHP	28	28	0
TOTAL	21 363	20 675	688

Source: REN data

In 2023, the main developments that took place on the national electricity transmission network were:

¹¹⁸ Source: [Estatísticas Rápidas das Renováveis da DGEG](#)

¹¹⁹ Estimated capacity value which is already attributed/committed for constructing new power plants, which, however, are still not connected to RESP (under licencing/building phase). Does not include UPAC. To the presented values, 452 MW are still under DGEG control but must be added.

- Reformulation and topological modification of the 150 kV network in the corridor Caniçada-Fafe-Riba d’Ave;
- Installation of the injector Vila Nova do Famalicão, equipped with two transforming units 400/60 kV(160 MVA each) and reinforcement of the transforming capacity in Alcochete substation, with the second 400/60 kV (170 MVA) unit transformer;
- Construction of the new line bays in the substations of Ribatejo at 400 kV, Fundão at 220 kV and Castelo Branco at 150 kV;
- Conclusion of the remodeling phase of equipment and protection, control and automation systems installed at Alto Mira, Sabóia, Palmela, Estoi, Pereiros, Valdigem, Rio Maior and Pocinho substations.

Table 3-19 shows the evolution of the total length of transmission and distribution networks (in continental Portugal and excluding the LV network managed by exclusively LV operators), by voltage level. In 2023, the aerial topology corresponded to 99% of the EHV network, while at the distribution, this percentage was 94%, 80% and 77% of the HV, MV and LV networks respectively.

Table 3-19 – Total length of transmission and distribution networks

(km)	2020	2021	2022	2023
Transmission network				
Extra High Voltage (EHV)	9 036	9 348	9 424	9 409
Distribution Network	229 167	230 676	232 089	234 669
High Voltage (HV)	9 574	9 607	9 637	9 674
Medium Voltage (MV)	74 110	74 380	74 701	75 047
Low Voltage (LV)	145 483	146 689	147 751	149 948

Source: REN, E-Redes

3.3.2 MONITORING INVESTMENTS IN GENERATION CAPACITY

In 2023, there were no significant developments concerning new investments in thermal generation capacity. According to the scenarios foreseen in the Monitoring Report on Security of Supply in the National Electricity System for the period 2024 to 2040 (RMSA-E 2023), the Tapada do Outeiro power plant is

expected to be kept in operation for a period of ten years and a competitive procedure was started to select who will run this power plant.

In terms of hydropower generation, there were no significant developments.

In terms of other generation technologies, there was an increase of 702 MW in solar capacity, the highlights being the new units of Cerca (142 MW), Morgável (46 MW), Tábua (40 MW), Alcochete (39 MW) and Albispark (30 MW). In addition to this installed generation capacity increase, another 629 MW of self-consumption solar capacity was also installed in 2023¹²⁰.

Regarding the predictions for the evolution of the installed capacity from renewable energy sources, the RMSA-E 2023 continues to adopt those included in the National Action Plan for Renewable Energies (PNAER), updated with the latest information on licensing procedures as well as with the scenarios used in the context of the National Energy and Climate Plan (PNEC) for 2030 and of the Roadmap for Carbon Neutrality 2050 (RNC 2050) as depicted in Table 3-20.

Table 3-20 – Predicted evolution of renewable energies 2024, 2030 and 2035

	2024	2030	2035
	(MW)	(MW)	(MW)
Hydro (< 30 MW)	7 577	7 577	7 577
Hydro (> 30 MW)	620	620	620
Wind	5 875	9 250	13 288
Solar	4 544	10 190	13 241
Biomass / Biogas	320	402	324
Urban Residues	77	97	78

Source: RMSA-E 2023 data

¹²⁰ Source: [DGEG Statistics Renewable on Renewables](#).

4 NATURAL GAS MARKET

4.1 NETWORK REGULATION

4.1.1 TECHNICAL FUNCTIONING

4.1.1.1 BALANCING

The general principles applicable to the balancing of the transmission network and infrastructure of the National Gas System (SNG) are established in the Infrastructure Operation Code (ROI) approved by ERSE. The detailed rules and procedures are provided in the Manual of Procedures for Global Technical Management of the System (MPGTG), approved by ERSE. The MPGTG adopt the transmission network balancing model provided for by the European Network Code¹²¹ on gas balancing of transmission networks, and the European Network Code for interoperability and rules of data exchange¹²².

The full implementation of the balancing model provided for in the European Network Code was completed in March 2021, with the entry into operation of the gas trading platform with delivery in Portugal, assigned to the entity MIBGAS, S.A., allowing balancing actions to be performed through the purchase and sale of standard products (daily and intraday) on the market by the entity responsible for the compensation of the gas network.

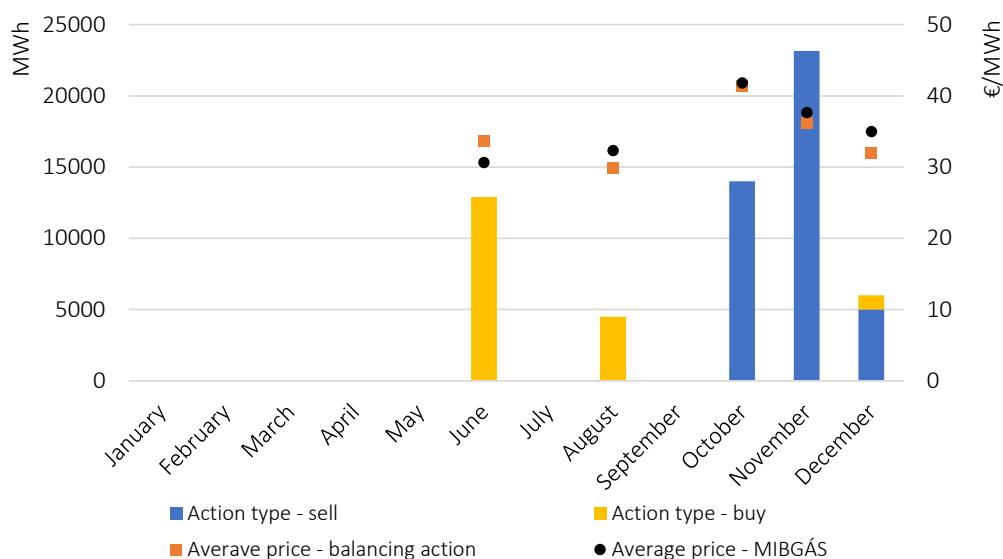
In 2023, the global technical manager of the system (GTG) carried out 26 balancing actions in the organised market through intraday products traded in the continuous market, of which 18 corresponded to sales actions (the quantity of energy awarded was 42 150 MWh) and 8 related to purchase actions (the quantity of energy awarded was 18 400 MWh).

Figure 4-1 shows the amount of energy awarded and the respective average prices resulting from the clearing actions performed in 2023.

¹²¹ Commission Regulation (EU) No. 2014/312, of 26 March

¹²² Commission Regulation (EU) No. 2015/703, of 30 April

Figure 4-1 – Quantity of energy and average prices resulting from balancing actions, through the purchase and sale of products on the market, in 2023



Note that the level of stocks in the transmission network may trigger balancing actions by the GTG in order to restore the balancing situation. In this sense, ERSE approved, upon a proposal from the GTG, a maximum limit per transaction in the balancing actions corresponding to 6 GWh, with the volumes of gas to be constituted by the technical manager of the system, for filling the transmission network or linepack corresponding to 330 GWh, and for optimising the commercial management of the high-pressure infrastructures, constituting the extension of the operating gas corresponding to 60 GWh.

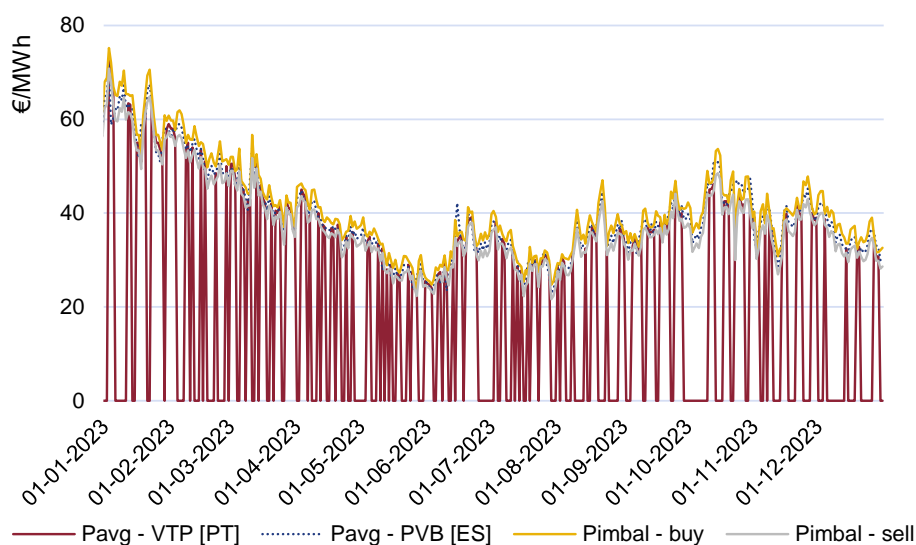
In addition to the gas transmission network balancing model, ERSE also approved a linepack flexibility service proposed by the transmission network operator¹²³. This service offers network flexibility to market agents, partially absorbing the quantities subject to the application of imbalance prices. The service is allocated through specific auctions, with a reserve price. Significant premiums were achieved in the allocation of the service for the 2022-2023 gas year, revealing the agents' great interest in the service.

The financial reconciliation of the imbalances (imbalance daily cash-out) of the market agents is carried out according to the European Network Code, applying daily imbalance prices indexed to the wholesale market. Figure 4-2 shows the imbalance prices applied to market agents in 2023. The evolution of imbalance prices reflects the reduction of wholesale gas prices.

¹²³ The conditions for offering the linepack flexibility service for 2022-23 have been published by the TSO [\[link\]](#).

The way in which the imbalance price is determined implies that when there is an average transaction price in the VTP (Portuguese hub), it is used as a reference for the imbalance prices by applying the adjustment (the value of the adjustment was 3%). When there are no transactions in the VTP with delivery on a given day, the price reference for calculating the imbalance price becomes the price in Spain (PVB), affected by the interconnection tariffs¹²⁴.

Figure 4-2 – Imbalance prices in the Portuguese balance area, in 2023



Source: REN Gasodutos data

4.1.1.2 ACCESS TO STORAGE INFRASTRUCTURE, LINEPACK AND ANCILLARY SERVICES

Access to infrastructure for storage, linepack and ancillary services is based on regulated third party access, with the operators providing these services under a separate ownership regime from the natural gas traders operating in the SNG.

Access to the Sines LNG terminal and to the natural gas underground storage of Carriço complies with the provisions of ERSE's Code on Access to Networks, Interconnections and Infrastructures (RARII), and ERSE's Manual of Procedures for Infrastructure Access (MPAI) that details the access regime. The procedures for

¹²⁴ Pursuant to Directive 13/2022, of 8 June, as explained in the section on regulatory developments. Prior 1 July 2022, PVB prices were only used when there were several days with no transactions on the VTP.

balancing, compensation and access to linepack are integrated in the MPGTG. These regulations are approved by ERSE.

Users of the gas transmission network have ancillary services to ensure their balance position (balancing). Besides the underground infrastructure for storage and reception of LNG (whose storage in tanks is also used as commercial storage), there are ancillary services offered by the technical manager of the system, using linepack in the transmission network. The assignment of linepack flexibility service to market agents was carried out as of October 2021, applying the new mechanism which provides for a remunerated service compatible with the European Network Code for compensation and attributed through standard products and competitive mechanisms.

The assignment of capacity in the storage infrastructures includes a tool made available by the technical manager of the system which constitutes a secondary market platform for capacity rights. The existence of this platform meets the requirement that came to be defined by Article 12 of Regulation (EU) 2022/2576, on 19 December 2022, which provides for measures to increase the use of the LNG reception, underground gas storage and pipeline infrastructures.

The underground storage facility of Carriço and the LNG terminal of Sines also benefit from a regulated third-party access regime. ERSE approves the capacity allocation mechanisms integrated in the MPAI and the tariff scheme applied for this infrastructure.

ERSE monitors the access conditions to the infrastructure that provide storage services, besides the transmission network. In 2023, high utilisation of this infrastructure and the respective capacity contracts continued. The entry capacity from the LNG terminal (regasification) was entirely booked in the annual allocation process for the gas year 2023-2024, as in previous years. Furthermore, the average contracting of underground storage capacity during 2023 was 100%.

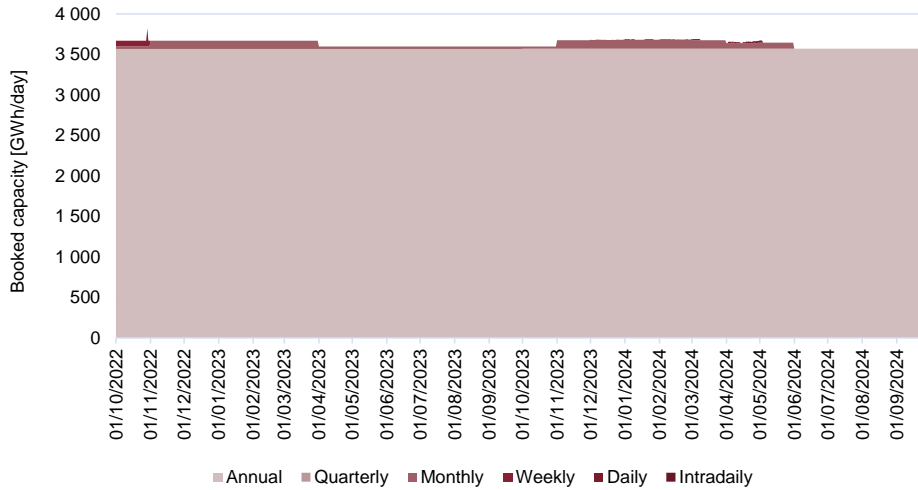
For a more comprehensive analysis of the annual evolution of capacity contracting for each gas infrastructure, it is suggested to consult the dashboard¹²⁵ provided by ERSE

Figure 4-3 shows the evolution of underground storage contracting by market agents with predominance of the annual and quarterly capacity products. For the gas year 2022-2023, the annual underground storage product became dominant in the contracting strategies. Additionally, the allocation of underground

¹²⁵ See the dashboard [here](#).

storage capacity is done in two stages: a first priority allocation for compliance with the security reserve obligations and a second commercial allocation subject to congestion premiums.

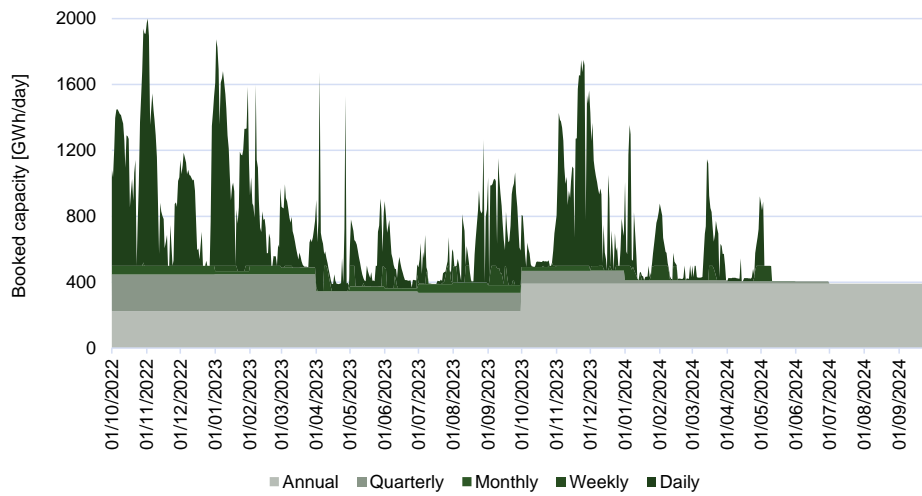
Figure 4-3 – Underground storage allocated capacity, by product



Source: REN Gasodutos data

The two figures below show the allocated capacity in the LNG terminal during the gas year 2022-2023 and a major part of the gas year 2023-2024. The booking of commercial storage in the LNG terminal is an additional source of flexibility to the gas system, however, due to the high reception rate of LNG ships (in 2023 the terminal registered receipt of 56 methane ships), the storage capacity of LNG is mainly directed at the terminal’s operational flexibility. In the case of injections into the transmission network (regasification of LNG), capacity was fully booked in the annual auction for 2023-2024.

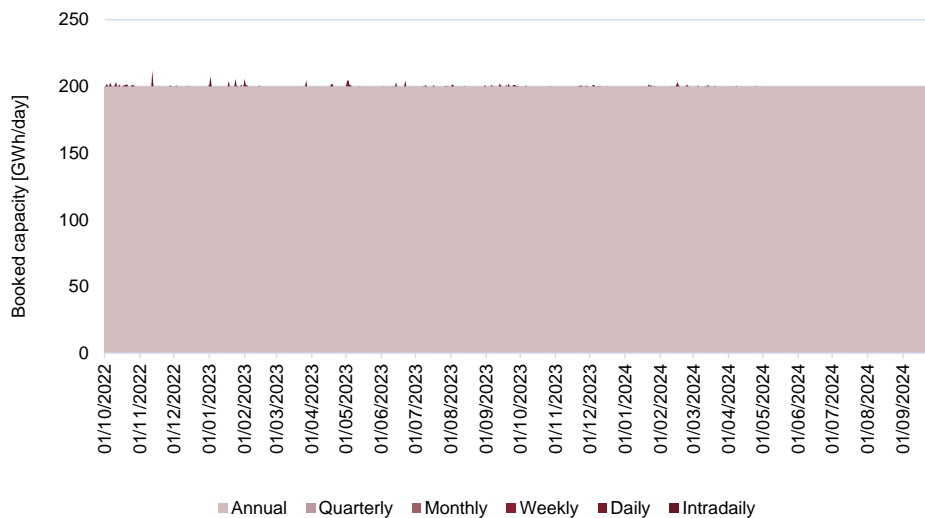
Figure 4-4 – Allocated capacity in the commercial storage of the LNG terminal, by product



Source: REN Gasodutos data

The commercial storage capacity of LNG made available on an annual basis was 500 GWh/day. Figure 4-5 shows the capacity contracting above this value, corresponding to the allocation of capacity in the short term, which is not occupied by unloading slots for methane ships. In regasification, contracting above the commercial capacity available in the annual allocation corresponds to the offer of additional firm capacity depending on the operating conditions of the LNG terminal at each moment and the offer of interruptible capacity. This optimisation of the capacity offered to the market is particularly important in the current circumstances of full annual contracting at the LNG terminal.

Figure 4-5 – Allocated capacity in the regasification of the LNG terminal, by product



Source: REN Gasodutos data

4.1.1.3 TECHNICAL QUALITY OF SUPPLY

The RQS for the electricity and gas sectors sets out the provisions on technical quality of supply. The technical component covers the following areas: continuity of supply and characteristics of gas supply (i.e. gas characteristics and supply pressure). The scope of application of the RQS covers customers, suppliers and operators of the sector's infrastructure¹²⁶.

Regarding the LNG terminal, general indicators have been established for service continuity with the objective of evaluating the service provided by this infrastructure in the following processes: reception of LNG from tankers and carriers, loading of tanker trucks with LNG (for the supply of satellite LNG units) and the injection of natural gas into the transmission network.

In 2023, the most significant aspects in terms of the performance of the LNG terminal were the following:

- The terminal supplied 6 805 LNG tanker trucks (an increase compared to the value recorded in 2021, which totalled 6 592 tanker trucks);
- The number of tanker trucks experiencing a delay in loading corresponded to 12% of the total. The main causes for delay were the unavailability of the fuelling stations, operational unavailability at the LNG terminal and technical problems;
- There were a total of 56 unloading operations involving ships (against 70 carried out in 2022);
- Four delays were recorded in unloading of ships; and
- The gas injection assignments for the transmission network recorded a compliance of 100%, as in previous years.

The continuity of supply to the transmission network is assessed based on the following indicators: average number of interruptions per exit point; average duration of interruptions per exit point (minutes/exit point); and average duration of interruptions (minutes/interruption). In 2023, there were no supply interruptions at transmission network exit points, as in the previous year.

¹²⁶ i.e. DSOs, TSO, underground storage operator and LNG reception, storage and regasification terminal operator.

In the distribution networks, as in the transmission network, performance is evaluated through indicators that consider the number and duration of interruptions. In 2023, there were no interruptions in 2 of the 11 existing distribution networks (Paxgás and Sonorgás) and only 0.5% of approximately 1.56 million customer installations suffered interruptions. Nearly 46% of the interruptions that occurred in the distribution networks were due to fortuitous events or cases of force majeure, caused by third-party interventions in the networks.

The RQS establishes that the monitoring of the characteristics of gas should be carried out by the infrastructure operators and sets limits for the following characteristics: Wobbe index, relative density, dew point, hydrogen sulphide and total sulphur.

In 2023, there was full compliance with the regulatory limits for natural gas characteristics, by transmission network monitoring point.

All distribution network operators presented information on the monitoring of the pressure in their networks. In 2023, the pressure supplied was monitored at 395 points in the distribution networks. There were one-off incidents of non-compliance of the pressure limits set out in the applicable legislation and in the monitoring methodologies, which according to the distribution network operators had no impact on the supply of gas to customers.

In accordance with the RQS, ERSE publishes an annual quality of service report¹²⁷ to present and assess the quality of service for the activities covered by the gas sector.

4.1.1.4 REGULATION DEVELOPMENTS

BALANCING MODEL FOR NON-INTERCONNECTED DISTRIBUTION GAS NETWORKS

Following Public Consultation no. [116](#), ERSE published a change in the balancing model for non-interconnected distribution gas networks, supplied through LNG Satellite Plants (UAG) and LNG tanks.

The approved model for balancing builds on the concept of a Virtual UAG, for the purpose of the commercial gas stocks of suppliers. This solution aggregates LNG quantities that each supplier has dispersed throughout all 56 UAG belonging to distribution networks in a Virtual UAG, simplifying the

¹²⁷ Available at [ERSE](#)

management of gas supply. This model also makes easier for suppliers to trade gas in these infrastructures, promoting competition.

Figure 4-6 depicts the model for gas balancing at distribution network UAG, separating the physical model from the commercial balancing model.

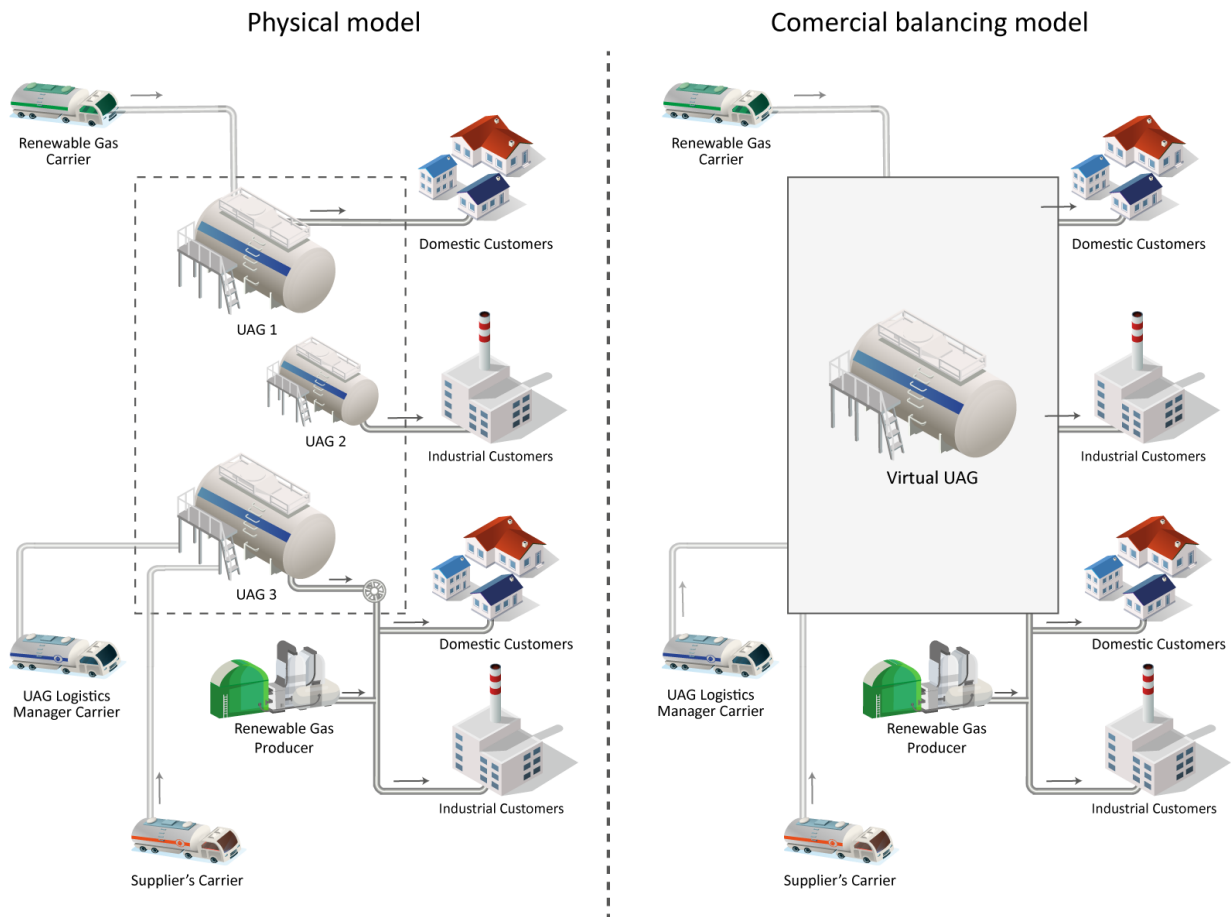
These changes are approved in MPGTG¹²⁸ and in the Manual for the logistics of distribution networks supplied via Satellite LNG stations (MGLA)¹²⁹, and a 9-month period was set for its implementation, since these changes significantly impact IT systems of network operators and suppliers.

Simplifying the process for gas supply within non-interconnected distribution networks, it is expected that the number of suppliers and the competition level may increase. It becomes also possible to supply gas from renewable sources, as foreseen in Decree Law no. 62/2020, of 28 of August, on an equal footing with the other gas networks.

¹²⁸ The revision of MPGGS was published by [Diretiva no. 8/2024](#), of 16 of January.

¹²⁹ The MGLA was published by [Diretiva no. 9/2024](#), of 1 of February.

Figure 4-6 – Gas balancing model for distribution network UAG



METHODOLOGY FOR ESTIMATING GAS CONSUMPTION PROFILES (DIR)

Following Public Consultation no. [118](#), ERSE published a set of methodologies, among which the methodology for estimating of gas consumption profiles. This methodology is provided for in the Commercial Relations Code¹³⁰ (Article 385).

ERSE received from network operators a proposal for a methodology for estimating of gas consumption profiles.

¹³⁰ Regulation No. [827/2023](#) of 28 July, which approves the ERSE Commercial Relations Code for the electricity and gas sectors

The methodology is applied in mainland Portugal, namely in the process of building consumption portfolios for participation in the wholesale gas market.

The main motivation for approving this methodology was the simplification of the annual approval processes for the respective values, along with a reinforcement of transparency and the participation of the various interested parties in the preparation of the methodology that served as the basis for this approval. The methodology for constructing consumption profiles is the basis for the annual calculation of profile values by the respective operators, without direct intervention from ERSE, which is responsible for supervising the application of the approved methodology and compliance with other obligations in this matter.

LINEPACK FLEXIBILITY SERVICE

The balancing rules of the gas transmission network in effect in Portugal include a linepack flexibility service proposed by the TSO¹³¹, as described in section 4.1.1.2.

The RNTG's operating parameters for the 2023-2024 gas year remained the same as in the previous gas year, with the exception of the alert limits, which were reduced from 20 to 10 GWh, inducing more proactive action by the GTG to keep RNTG compensation within a tighter band. The alert levels imply that when the deviation of gas stocks in the RNTG in relation to the reference exceed, by excess or by default, the alert value, the GTG must carry out compensation actions to bring stocks back within the alert levels.

4.1.2 TARIFFS FOR CONNECTION AND ACCESS TO INFRASTRUCTURE AND CONNECTION COSTS

REGULATORY FRAMEWORK

- ERSE is responsible for approving the tariff and price calculation methodology for the natural gas sector, the methodologies for regulating allowed revenues, as well as the transitional tariffs for supply to end-customers, the network and infrastructure access tariffs and the prices for regulated activities.
- The tariff calculation methodology and regulation methodologies are stipulated in the ERSE's Natural Gas Tariffs Code, which is drawn up and approved by ERSE, after public consultation and

¹³¹ The conditions for offering the linepack flexibility service for 2022-23 have been published by the TSO [\[link\]](#).

the mandatory but non-binding opinions of its advisory bodies, in particular the Tariff Council. The tariff approval process, including its timetable, is also regulated by the ERSE's Natural Gas Tariffs Code.

- The access tariffs to natural gas networks and infrastructure, in force in 2023¹³², are the result of the rules approved in the 2021 regulatory review¹³³ (gas year 2022-2023) and the 2023 regulatory review¹³⁴ (gas year 2023-2024).

PROCEDURES AND METHODOLOGY FOR CALCULATING NATURAL GAS NETWORK AND INFRASTRUCTURE ACCESS TARIFFS

In the natural gas sector, there are several regulated activities, in which the allowed revenues established by ERSE are recovered by the following tariffs: Global Use of System, Use of Transmission Network, Use of LNG Reception, Storage and Regasification Terminal, Use of Underground Storage, Switching Logistics Operation (OLMC), Use of Distribution Network in MP, Use of Distribution Network in LP.

Underlying the principle that the services associated with each regulated activity must be identified, the aim is to define the physical variables most appropriate to the valuation of the charges actually caused by the service provided to each client. This set of physical variables and the corresponding metering rules constitute the billable elements for each tariff.

The values of these billing variables are determined in order to present a structure that adheres to the structure of marginal or incremental costs, which includes a scale that ensures the allowed revenues for each regulated activity and the economic-financial equilibrium of the companies.

The network access tariff prices for each billing variable are determined by adding the corresponding tariff prices per activity. As the tariffs that make up this sum are based on marginal costs, cross-subsidisation between customers is avoided and efficient allocation of resources is ensured.

This methodology enables detailed knowledge of the various tariff components by activity. Thus, each customer can know exactly how much they pay, for example, for the use of the distribution network in MP and in which billing variable this value is considered. Transparency in the formulation of tariffs, which is a

¹³² These correspond to the tariffs approved for the 2022-2023 gas year, in force from 1 October 2022 to 30 September 2023, and those approved for the 2023-2024 gas year, in force from 1 October 2023 to 30 September 2024.

¹³³ According to [Regulation no. 785/2021](#), of 23 August.

¹³⁴ According to [Regulation no. 825/2023](#), of 28 July.

consequence of the implementation of such a system, allows for price comparisons between different suppliers, distinguishing the prices subject to competition from the prices established by regulatory decision.

Access tariffs for natural gas networks and infrastructure are paid for access to the respective SNGN infrastructure and cover the tariffs of Global Use of System, Use of Transmission Network, Use of Distribution Network, Use of the LNG Reception, Storage and Regasification Terminal, Switching Logistic Operation and Use of Underground Storage. Access tariffs to networks and infrastructure are approved by ERSE.

With regard to networks, access is paid for by all natural gas consumers, such that network access tariffs are included in the prices paid by natural gas consumers, both in market-based prices and in transitional tariffs for supply to end-customers. General speaking, these tariffs are paid by suppliers on behalf of their customers¹³⁵. As for the Use of the LNG Reception, Storage and Regasification Terminal and for the Use of Underground Storage tariffs, these are paid by the users of this infrastructure.

Table 4-1 and Table 4-2 show the set of network and infrastructure access tariffs and the respective billing variables.

Table 4-1 – Structure of the tariffs which comprise the gas network access and of infrastructure tariffs

Network access and of infrastructures tariffs	Billing variables	EHV Clients	HV Clients	MV Clients	SpLV Clients
Global Use of the System tariff	Energy	●	●	●	●
Use of the Transmission Network tariff	Capacity	●			
	Energy	●	●	●	●
Use of the Distribution Network tariff	Fixed term		●	●	●
	Capacity		⊙	⊙	
	Energy		●	●	●

⊙ - Depends on the tariff's option

Source: ERSE data

¹³⁵ Alternatively, this tariff may be paid directly by customers benefiting from the status of market agent, i.e. customers buying natural gas directly on the markets and who are responsible for managing imbalances arising from differences between the capacity contract, demand forecasts for their customer portfolios and actual consumption recorded.

Table 4-2 – Structure of tariffs for natural gas infrastructure

Network access and infrastructures tariffs	Billing variables
Use of the LNG Reception, Storage and Regasification Terminal tariff	Fixed term *
	Capacity
	Energy
Use of the Underground Storage tariff	Capacity
	Energy

* Applies only to the service for loading of tanker trucks with LNG

NETWORK ACCESS AND INFRASTRUCTURE TARIFF PRICES

The network access tariffs applicable in 2023 correspond to the approved tariffs for the gas year 2022-2023¹³⁶, which were in effect from 1 October 2022 to 30 September 2023, and to those approved for the gas year 2023-2024¹³⁷, in effect from 1 October 2023 to 30 September 2024.

In 2019, due to the changes in the methodology regarding the structure of tariffs for transmission network use and associated with the implementation of Regulation (EU) 2017/460, which establishes a network code on harmonised transmission tariff structures for natural gas, ERSE adopted a new validity period for the regulated tariffs to match the capacity attribution year. In this context, the tariff application period (previously from 1 July to 30 June) was amended to cover the period of 1 October to 30 September of the following year.

For the gas year 2023-2024, the networks access and infrastructure tariffs, based on the expected demand for that year, have undergone changes as shown in Table 4-3 and Table 4-4.

¹³⁶ Published by [Directive No. 15/2022](#), of 28 June, in the wording of [Directive No. 1/2023](#), of 9 January

¹³⁷ Published by [Directive No. 13/2023](#), of 25 July.

Table 4-3 – Tariff Evolution for high-pressure infrastructure, use of networks, overall use of the system and the switching logistics operator ¹³⁸ for the gas year 2023-2024, by activity

Tariffs per activity	Average price 2022-2023 (EUR/MWh)*	Average price 2023-2024 (EUR/MWh)	Change
Use of the LNG Terminal (Sines)	0.37	0.50	36.9%
Use of the Underground Storage	7.70	6.11	-20.6%
Use of the Transmission Network	0.33	1.13	240.4%
Use of the Distribution Network	8.33	9.43	13.3%
Global Use of the System	0.07	0.46	524.9%
OLMC	0.01	0.00	-100.0%

* Application of 2022-2023 tariffs to the demand forecasted for 2023-2024.

Source: ERSE data

Table 4-4 – Tariff evolution for network access for the gas year 2023-2024, by type of client at each pressure level

Network access tariffs per pressure level	Average price 2022-2023 (EUR/MWh)*	Average price 2023-2024 (EUR/MWh)	Change
Power Plants	0.44	1.47	231.5%
High Pressure Customers	0.28	1.31	371.1%
Medium Pressure Customers	2.30	3.36	45.7%
Low Pressure Customers with an annual consumption above 10,000 m ³	11.39	13.18	15.7%
Low Pressure Customers with an annual consumption lower than or equal to 10,000 m ³	32.52	35.26	8.4%

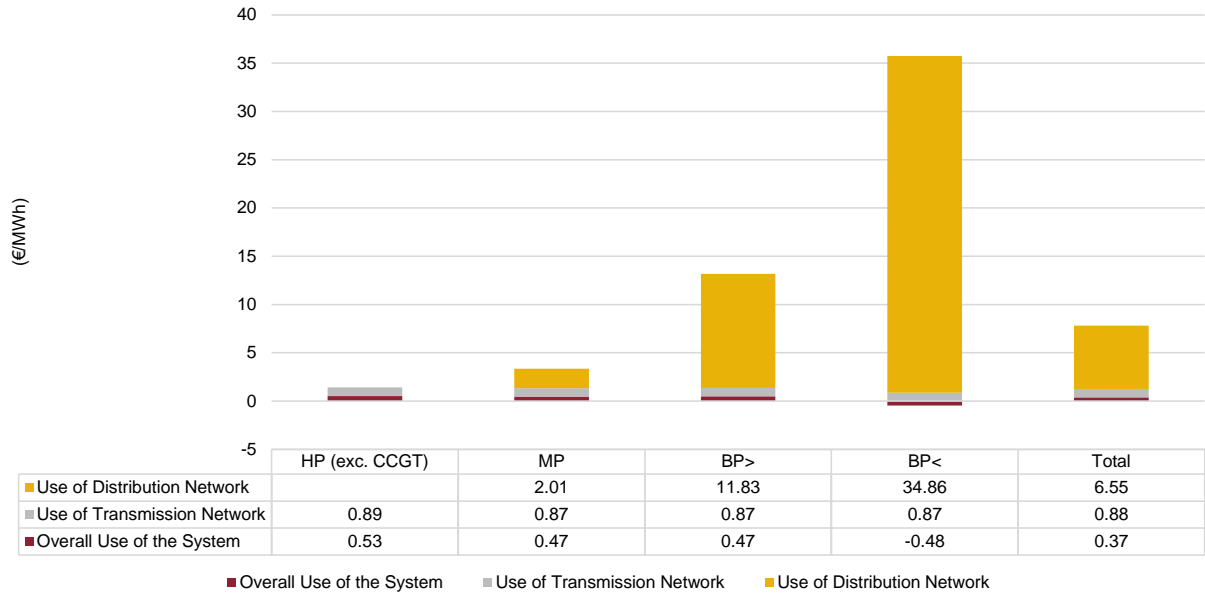
* Application of 2022-2023 tariffs to the demand forecasted for 2023-2024.

Source: ERSE data

The following figures (Figure 4-7 and Figure 4-8, respectively) show the breakdown and structure of the average price of network access tariffs by the various tariffs that compose them, for each pressure level. The average price of the high-pressure access tariff does not include power plants.

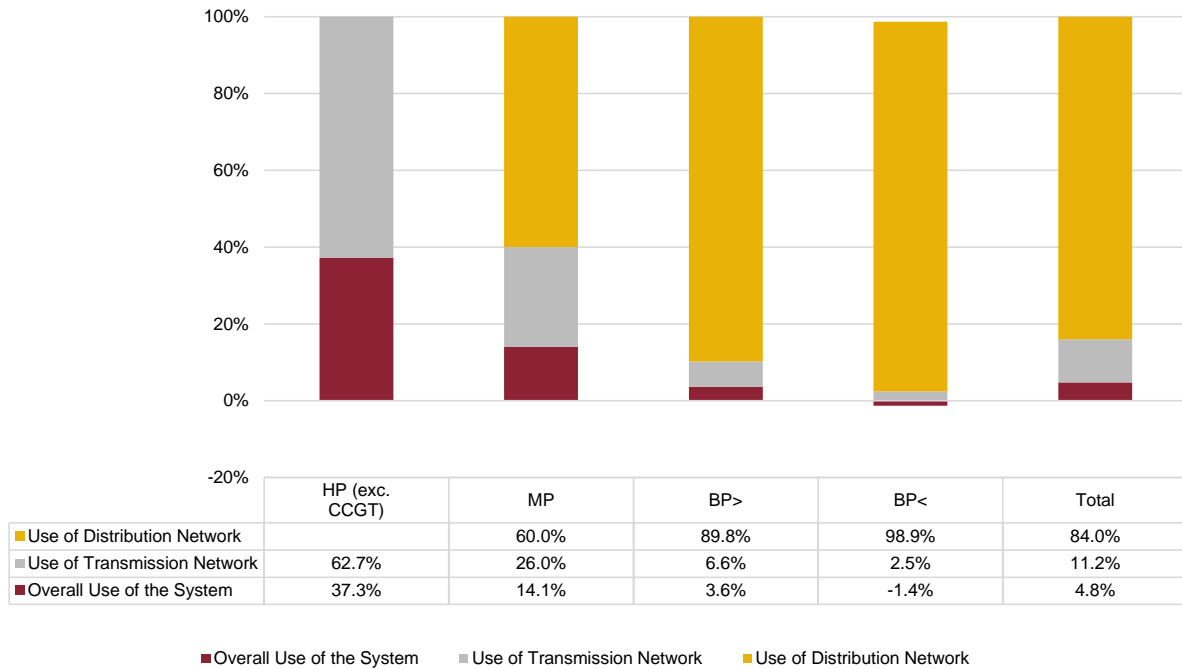
¹³⁸ From the 2023-2024 gas year onwards, the revenues of the switching logistics operator (OLMC) will be recovered through the UGS tariff, and the autonomous switching logistics operator tariff will be eliminated.

Figure 4-7 – Breakdown of the average price of network access tariffs, in the tariff year 2023-2024



Source: ERSE data

Figure 4-8 – Structure of the average price of network access tariffs, in the gas year 2023-2024



Source: ERSE data

REGULATORY DEVELOPMENTS

REVISION OF THE TARIFFS CODE

On 30 March 2023, ERSE launched [Public Consultation no. 114](#) with a proposal to reformulate the gas Tariffs Code, justified by the start of a new regulatory period in 2024.

In terms of the tariff structure, the main changes proposed were aimed to harmonise the tariff rules applicable to the switching logistics operator, which was brought about by Decree Law no. 15/2022 of 14 January. In addition, changes were proposed in terms of the tariff options available, for example, the elimination of the Short Use tariff option for Medium Pressure (MP) and Low Pressure customers with annual consumption of more than 10,000 m³ (BP>), in line with what was done for High Pressure (AP), as well as adapting the rules with a view to the economic sustainability of regulated activities, in a context of decarbonisation and energy transition, through the introduction of an Incentive to Optimise Demand Forecasts in Gas Distribution Network Investment Plans, among other improvements.

The gas Tariffs Code, applicable for the 2023-2024 gas year, was approved by [Regulation no. 825/2023](#) of 28 July.

On 4 October 2023, ERSE launched [Public Consultation no. 117](#) pursuant to Article 26 of the Network Code on Harmonised Tariff Structures for the Transmission of Gas, approved by Commission [Regulation \(EU\) 2017/460 of 16 March](#) (hereinafter referred to as the Tariff Network Code). Under the terms of the Tariff Network Code, transmission tariffs must be based on a reference price methodology. The Tariff Network Code defines "reference price methodology" as the methodology applied to the portion of revenues from transmission services to be recovered through transmission tariffs based exclusively on capacity variables, with the aim of obtaining reference prices. In turn, the network code defines "reference price" as the price for a firm capacity product with a duration of one year, applicable at entry and exit points and which is used to establish capacity-based transmission tariffs.

The public consultation covered, in addition to the methodology of the tariff for use of the transmission network, matters relating to discounts, multipliers and seasonal factors, as provided for in Article 28 of the Tariff Network Code. The consultation process ended in April 2024, with the publication of ERSE's reasoned decision and the publication of [Directive no. 12/2024](#), of 10 April, which approves the methodology for determining the reference prices of the tariff for the use of the gas transmission network. Following the

consultation, the current reference price methodology was maintained, although subject to the updating of parameters that condition the resulting tariff structure, which will take effect from the 2024-2025 gas year.

REGULATORY METHODOLOGIES FOR DETERMINING ALLOWED REVENUES

2023 was the last year of the regulatory period from 2020 to 2023. As mentioned in the previous report, this regulatory period now coincides with the calendar year rather than the gas year. The regulatory models applied to each regulated activity are summarised below:

- For the reception, storage and regasification of LNG, a price cap¹³⁹ methodology is applied to the OPEX¹⁴⁰ and a rate-of-return methodology is applied to the CAPEX¹⁴¹. A tariff adjustment mitigation mechanism is also applied, which takes into account the positive externalities for the National Gas System associated with this activity as well as a mechanism for reverting to the tariffs of amounts received in relation to the capacity allocation auction premiums.
- For high pressure underground storage, a price cap¹⁴² regulation methodology is applied to the OPEX and a rate-of-return methodology is applied to the CAPEX. As with reception, storage and regasification of LNG, the mechanism for mitigating adjustments to the allowed revenues and the mechanism for reversing amounts received in relation to premiums from capacity allocation auctions are also applied.
- For high pressure natural gas transmission, a price cap¹⁴³ regulation is also applied to the OPEX and a rate-of-return methodology is also applied to the CAPEX. In this activity, a mechanism is applied to mitigate the effects of demand volatility on the allowed revenue that can be recovered through

¹³⁹ The cost driver that determines the evolution of revenue recoverable by application of the respective tariff is re-gasified energy.

¹⁴⁰ Operational Expenditure

¹⁴¹ Capital Expenditure

¹⁴² The cost driver that determines the evolution of revenue recoverable by applying the respective tariff is extracted/injected energy.

¹⁴³ The cost driver that determines the evolution of revenue recoverable by application of the respective tariff is the capacity used in commercial point.

tariffs, as well as the mechanism for the reversal to tariffs of amounts received for capacity allocation auction premiums also applied in the other two high-pressure activities.

- Global Technical System Management: application of a revenue cap incentive methodology for OPEX and rate-of-return methodology for CAPEX.
- Switching operator (OLMC)¹⁴⁴: application of a revenue cap methodology for operational costs (OPEX) and rate-of-return methodology for CAPEX.
- Natural Gas Distribution: price cap¹⁴⁵ methodology for OPEX and rate-of-return methodology for CAPEX;
- Suppliers of Last Resort: price cap¹⁴⁶ methodology for OPEX and the remuneration of the working capital. Moreover, these companies have the right to an additional revenue of 4€ per customer (number of customers at the beginning of the regulatory period). In the gas sector, reference costs are also defined for retail commercialisation activity.

The annual efficiency factors applied to OPEX were (i) 2% in reception, storage and regasification of LNG; (ii) 3% in transmission; (iii) 2% in global technical system management; (iv) 3% in underground storage; (v) 2% and 5%, per company, in distribution; and (vi) 2% for all suppliers of last resort.

It should be noted that this regulatory period introduced a principle of acceptance of investments differentiated in terms of remuneration, taking into account their nature and the fulfilment of their initial objectives. As long as the investments do not meet their initial objectives, they will only be remunerated at the financing cost.

The remuneration of the regulatory asset base, which corresponds to the Weighted Average Cost of Capital (WACC), is partially indexed to the yields of treasury bonds (OT), in order to reflect the evolution of the economic and financial context on the WACC¹⁴⁷. Given the volatility of the market indicators, a cap and a floor were established.

¹⁴⁴ Entity that manages the process of changing electricity and natural gas suppliers.

¹⁴⁵ The cost drivers that determine the evolution of revenue recoverable by application of the respective tariff are distributed energy and supply points.

¹⁴⁶ The cost driver that determines the evolution of revenue recoverable by application of the respective tariff is average number of customers.

¹⁴⁷ For 2023, the asset remuneration rates were the following: high-pressure activities – 4.85%; distribution activities – 5.05%.

CONTESTATION OF TARIFF DECISIONS

With regard to appeals against a decision or methodology used by the regulatory authority, as provided for in Article 41(1) of Directive 2009/73/CE, reference should be made to the legal actions which the concessionaires of the natural gas distribution networks filed against ERSE each year, challenging the tariffs and prices for the use of the medium and low-pressure distribution network since 1 July 2010.

The companies intended for ERSE to recognise their right to additional income for the exercise of their activity, invoking, for this purpose, the right to compensation that had been negotiated with the State and reflected in the modified concession contracts granted in 2008. At stake were questions regarding the values to be recognised in the income to be recovered by the tariffs associated with the amortisation of its assets and the alleged right to successive revaluations of those assets. Those claims would represent an aggregate increase of allowed revenues estimated in more than 1 billion euros during the concession period, which would be paid by all medium and low-pressure consumers regardless of their supplier.

In a decision on 6 January 2023¹⁴⁸, the Lisbon Administrative Court rejected all of the distribution network operators for the gas years 2010-2011 to 2013-2014. The Court strongly valued ERSE's independent status, recognising that ERSE is not bound to the compliance with compensatory and/or indemnity rules of a nature other than tariffs, nor to the economic-financial balance other than that of the regulated activity itself. Therefore, according to the Court, ERSE cannot be obliged to guarantee before third parties the fulfilment of obligations of other legal persons, public or private.

The Court also approved ERSE's basic decision, stating that "there is no evidence in the records that the acts under review [ERSE's tariff decisions] should have been issued under other terms", recognising that ERSE's actions allowed "preventing the use of excessive remuneration (for double consideration of inflation, thus exceeding the limit of remuneration/opportunity cost allowed)".

At the moment, the lawsuits concerning the years after 2014 have yet to be decided by the courts. Nevertheless, the arguments put forward by the challenging companies are in all respects identical to those relating to previous years.

¹⁴⁸ Decision issued in the context of case no. 2393/10.2BELSB and appendices (cases no. 2879/11.1BELSB, 2681/12.2BLSB and 2780/13.4BELS).

NETWORK CONNECTION CHARGES

The connection of a facility to the natural gas network entails costs that depend on the facility to be connected (pressure level, technical requirements), the network itself (distance) and the physical surroundings (route).

The regulatory framework that applies to natural gas network connections, which include the applicable rules and respective charges, is set out in the natural gas Commercial Relations Code (RRC), approved by ERSE. In 2023, following the regulatory review carried out through [Public Consultation no. 113](#), some network connection issues were reviewed. The review included the introduction of commercial conditions for connecting gas producers to the grid, adapting the content of the RRC to the provisions of Decree Law 62/2020 of 28 August.

The current regulatory framework includes aspects such as mandatory third party access, the type of charges that can be levied on petitioners, rules for calculating network connection charges, budget content and submission deadlines that apply to network operators, terms for connection charge payment, construction of network connection elements or duties to provide information, as briefly explained below.

Thus, in relation to third party access, the TSO is required to provide a network connection to customers who request it in accordance with the approved commercial conditions. DSOs are subject to a connection requirement only for customer installations with a minimum annual consumption of 10 000 m³ (n), as well as installations located within the area of influence of the respective network, defined as the geographic area in the vicinity of the existing network (currently 100 m). Natural gas facilities cannot be connected to networks without the prior issuance of a licence or authorisation by the relevant administrative bodies.

Connecting elements are the physical infrastructures that enable the connection of a natural gas facility to the network, classified as network to be built or distribution branches. The construction of connecting elements is a network operator's obligation although the petitioner may assume that responsibility. Once constructed, the connection elements become an integral part of the networks as soon as they are deemed to be in proper technical operating conditions by the operator.

Networks are paid for by natural gas users through network connection charges (according to the rules approved by ERSE) and the use of the network tariffs, which constitute a portion of the natural gas bill (the difference between the investment cost and the cost directly attributed to the petitioner through connection charges is borne by all users through use of the network tariffs).

Finally, it should also be noted that the code requires network operators to send ERSE information every six months on the number of connections made, network connection charges paid by petitioners broken down by type of connecting element, total length of elements built, average budgeting deadlines and average execution times, as well as the number of changes made to existing connections.

4.1.3 MECHANISMS FOR CONGESTION MANAGEMENT AND ALLOCATION OF THE AVAILABLE CAPACITY IN THE INTERCONNECTIONS

The mechanisms for capacity allocation and congestion management in the SNG infrastructure are established in accordance with the principles set out in RARII and MPAI, which are approved by ERSE.

The RARII integrates the principles set out in Regulation (EU) no. 2017/459 of 16 March, establishing a network code on capacity allocation mechanisms in gas transmission systems. This European Regulation is complementary to Regulation (EC) no 715/2009 of the European Parliament and of the Council of 13 July 2009, on conditions for access to the natural gas transmission networks.

The RARII establishes capacity allocation through harmonised products – annual, quarterly, monthly, daily and intraday – ideally bundled and allocated through competitive processes. The capacity in the interconnections is allocated at the Virtual Interconnection Point¹⁴⁹ that aggregates the two physical interconnections ("Iberian VIP"). The capacity allocation has as a European reference the so-called "capacity allocation year", which takes place between 1 October and 30 September of the following year.

The annual product is allocated for the five following years, as foreseen in the European network code. Bundled capacity on the interconnection is allocated through the PRISMA¹⁵⁰ platform.

With regard to capacity allocation and congestion management mechanisms at the Iberian VIP, the MPAI establishes: (i) the offer of intraday capacity products in the interconnections; (ii) the implementation of the mechanism for capacity surrender by market agents applied to monthly capacity products; (iii) the implementation of the use-it-or-lose-it mechanism; and (iv) the implementation of an oversubscription and buy-back mechanism to bundled capacity products, safeguarding compliance with Decision 2012/490/EU of 24 August, following the amendment of Annex I to Regulation (EC) no 715/2009 of the European

¹⁴⁹ VIP, or Virtual Interconnection Point, is the aggregation of all international interconnection points in a single virtual point on which the contracting and identification of the crossing capacity between Portugal and Spain takes place.

¹⁵⁰ www.prisma-capacity.eu

Parliament and of the Council of 13 July 2009, on conditions for access to the natural gas transmission networks.

In this respect, a reference must be made to Council Regulation (EU) 2022/2576, of 19 December, enhancing solidarity through better coordination of gas purchases, reliable price benchmarks and exchanges of gas across borders. One of the measures of this European regulation in an emergency context mandates TSOs to implement a monthly congestion management mechanism, of Use-It-Or-Lose-It nature (monthly UIOLI), from 1 April 2023 (vd. Article 14 of the Regulation). The same regulation allows NRAs to derogate this obligation in the presence of congestion management mechanisms or the allocation of daily and within day interruptible capacity. During 2023, ERSE derogated paragraphs 1 to 6 of Article 14 of Regulation (EU) 2022/2576, on grounds of the existing interruptible capacity allocation mechanism in VIP Ibérico.

Considering the requirements foreseen in the Regulation and the non-opposition statement by CNMC (regulatory authority of the adjacent TSO), ERSE issued the derogation decision¹⁵¹ of paragraphs 1 to 6 of Article 14 of Regulation (EU) 2022/2576.

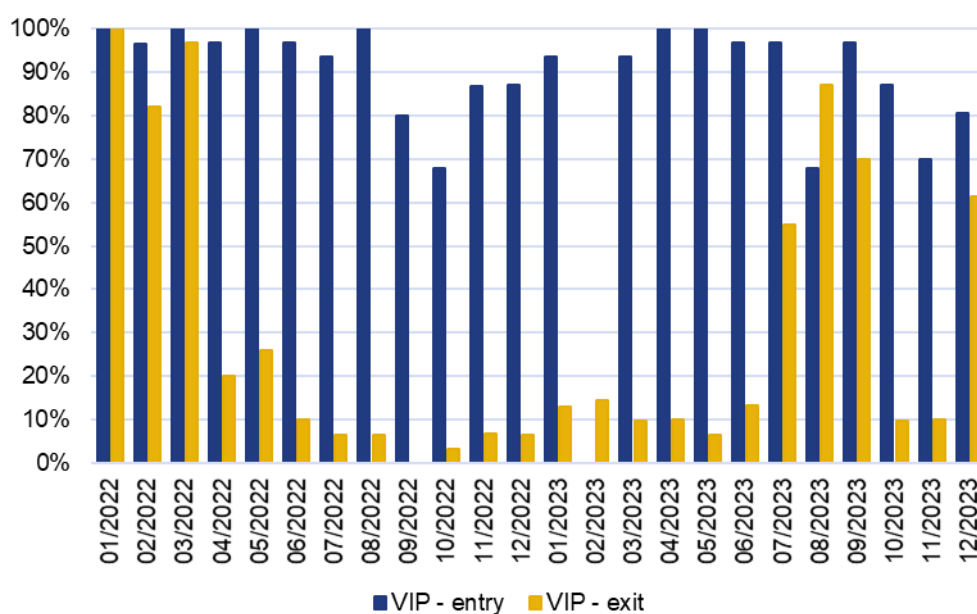
It also worth noting that TSOs of Portugal and Spain published a coordinated procedure¹⁵² for the allocation of interruptible capacity at VIP Ibérico, which was subject to a public consultation during July 2022, within the South Gas Regional Initiative, and published in 2023.

The system technical manager, in coordination with the interconnected network operator (Enagás), provides daily offers of firm capacity on the Iberian VIP by means of the oversubscription and buy-back mechanism. This joint mechanism was approved in 2018. During 2023, the implementation of the harmonised methodology of overbooking and buy-back in the Iberian VIP resulted in the availability of an overcapacity on 301 days (in 2022, it was 336 days), in the direction of Spain to Portugal, and 110 days (in 2022, it was also 110 days) in the direction of Portugal to Spain. The average value of the firm capacity offered in the VIP by the overbooking and buy-back mechanism was of 13.2 GWh/d (13.7 GWh/d in 2022) and 4.5 GWh/d (7.0 GWh/d in 2022), in the mentioned directions. The following figure shows the capacity offered in this way. This offered capacity was not booked.

¹⁵¹ Available in https://www.erse.pt/media/w5xhtz34/decisao-derrogacao-nos-1-a-6-do-art-14-do-reg-ue-2022_2576.pdf

¹⁵² Available online [\[link\]](#).

Figure 4-9 – Monthly percentage of days with firm capacity offer on the Iberian VIP, by means of the oversubscription and buy-back mechanism, in 2022 and 2023



Source: ENTSOG, calculation by ERSE

ERSE approved in 2020, with effect from gas year 2020-2021, the methodology for the joint application of the mechanism for the long-term unused capacity reserve loss (Long Term Use-It-Or-Lose-It, LT UIOLI) in the interconnection. The application of the joint mechanism by REN and Enagás did not result in any capacity being bought back. It should be noted that, with the end of historical rights over interconnection capacity associated with supply contracts with take-or-pay clauses, mainly in 2020 and completely in 2022 for the Iberian VIP, there is no longer any capacity contracted in an annual product beyond the following gas year, which is one of the assumptions for applying the LT UIOLI mechanism.

ACCESS TO INTERCONNECTIONS

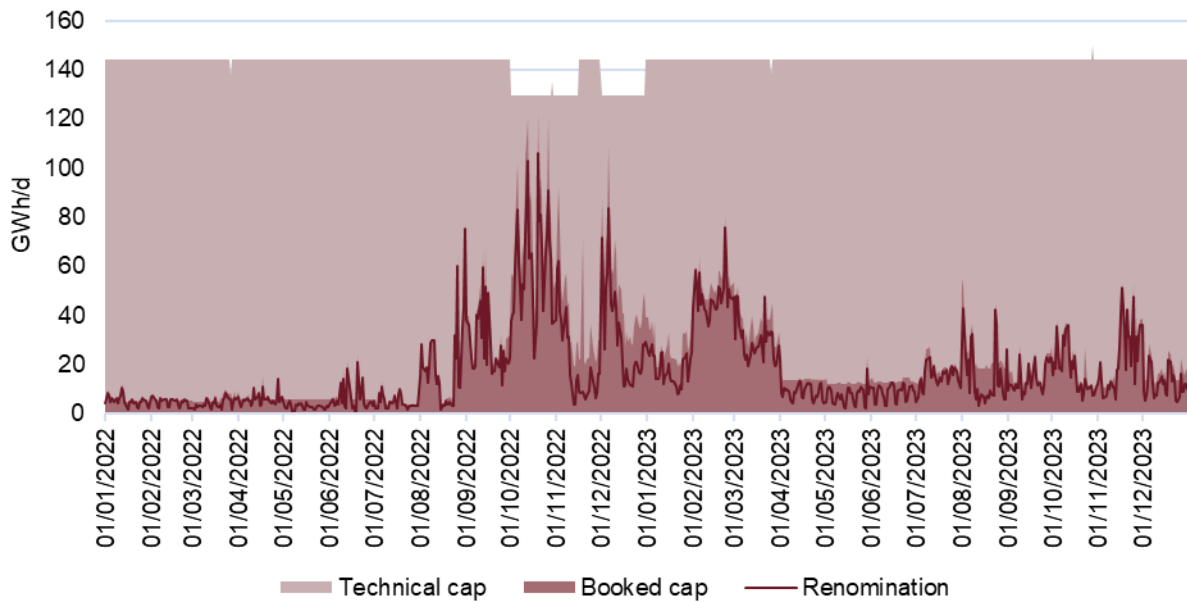
Access to interconnections occurred through annual, quarterly, monthly, daily and intraday product auctions, carried out on the PRISMA platform. Since the end of 2020, most of the capacity in the VIP has been contracted in a bundled manner, with only a small part allocated in Portugal as unbundled capacity. Since March 2022, contracting capacity in the Iberian VIP is fully bundled.

In 2023, there were no situations where demand for capacity in the VIP exceeded supply (except for one day when export capacity was fully booked). The LNG terminal of Sines remained the main source of supply

for the Portuguese market. The contracting of capacity in the export direction (from Portugal to Spain) grew significantly (58% compared to 2022), corresponding to an average of 23 GWh/day. In the import direction, contracted capacity also increased (4% compared to 2022), corresponding to an average of 28.2 GWh/day, due especially to the period from September to October 2022. More capacity was booked for export than for import.

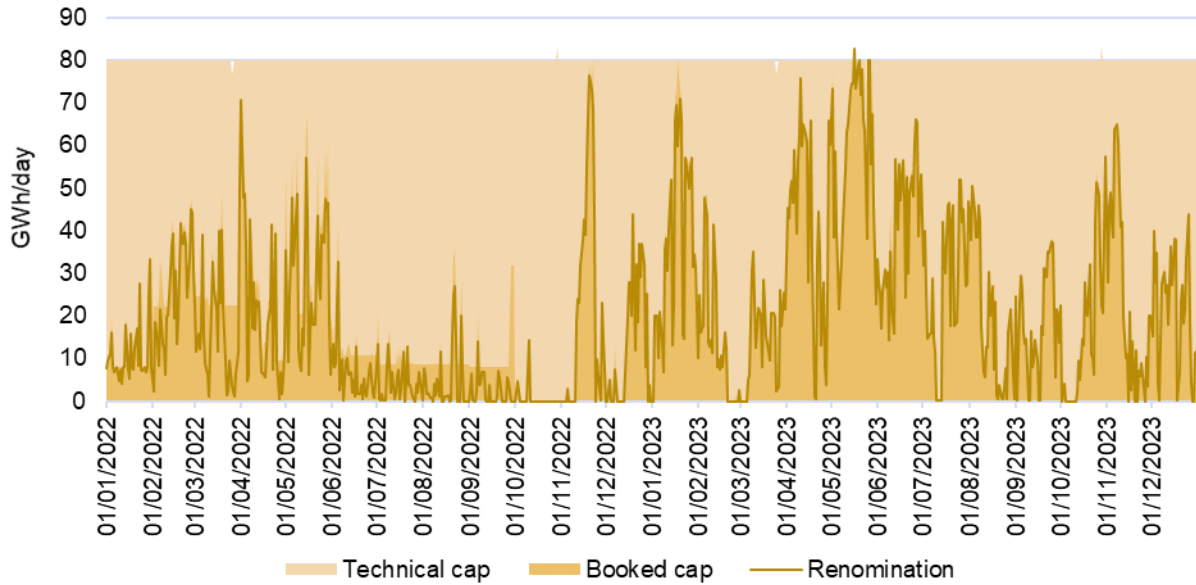
The following two figures show the capacity booking in VIP Ibérico, comparing with nominations submitted by shippers and the technical capacity offered, either for import (entry) or export (exit).

Figure 4-10 – Booked capacity and nominations in VIP Ibérico in 2022 and 2023 (import)



Source: REN Gasodutos data.

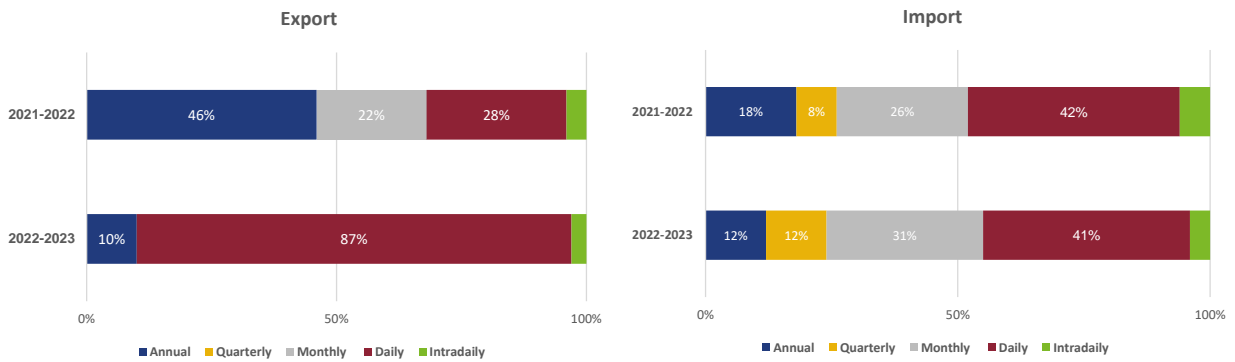
Figure 4-11 – Booked capacity and nominations in VIP Ibérico in 2022 and 2023 (export)



Source: REN Gasodutos data

In both directions of the VIP Ibérico, shippers used booked capacity at high levels (98% in export and 77% in import), resulting from short term capacity bookings.

Figure 4-12 – Capacity booking structure in VIP Ibérico in gas years 2021-22 and 2022-23



Source: REN Gasodutos data

COOPERATION

The Portuguese and Spanish TSOs maintain close cooperation to take advantage of the interoperability of the two systems. This cooperation was materialised in agreements for the management of the

Portugal-Spain interconnections, with a rationale similar to that of the interconnection agreements provided for in the Network Code on Interoperability and Data Exchange Rules approved by Commission Regulation (EU) 2015/703 of 30 April 2015.

INVESTMENT MONITORING OF THE NATURAL GAS INFRASTRUCTURE OPERATORS

National Development and Investment Plan for the Natural Gas Transmission Network and Infrastructure

REN Gasodutos, S.A. as operator of the National Natural Gas Transmission Network (RNTGN), submitted to DGEG and ERSE its proposal of the indicative Ten-year Development and Investment Plan for the National Transmission Network, Storage Infrastructure and LNG terminals (RNTIAT) for the period 2024-2033 (PDIRG 2023). According to Article 87(2) of Decree Law 62/2020 of 28 August¹⁵³, ERSE must launch a public consultation on the proposal.

In line with its responsibilities, ERSE submitted the PDIRG 2023 proposal for public consultation, from 8 May to 20 June 2023¹⁵⁴.

ERSE's assessment of the PDIRG 2023 Proposal, the Opinions received from the ERSE Advisory Council and the Tariff Council, and the analysis of the comments received from the participants in the public consultation, allowed ERSE to give a globally positive Opinion, namely on those projects classified as *Base Projects*, but stressing the importance of being cautious when approving and building those projects. ERSE recommended to postpone those Projects classified as "Complementary Projects", namely those related to hydrogen, to await the conclusion of the ongoing revision of the national policy for Energy and Climate, which will benefit from the lessons learned in recent years as well as from European discussions on the integration of different energetic sectors.

¹⁵³ Available on <https://diariodarepublica.pt/dr/legislacao-consolidada/decreto-lei/2020-146809387>

¹⁵⁴ <https://www.erse.pt/atividade/consultas-publicas/consulta-p%C3%BAblica-n%C2%BA-115/abertura/>

4.2 PROMOTING COMPETITION

4.2.1 WHOLESale MARKET

4.2.1.1 MONITORING THE PRICE LEVEL, TRANSPARENCY LEVEL AND THE LEVEL AND EFFECTIVENESS OF MARKET OPENING AND COMPETITION

Since 16 March 2021, the organised market for product trading with VTP delivery in Portugal is operating on the MIBGAS platform¹⁵⁵. In 2023, despite a continued low volume of transactions in the organised market, 170 GWh in transactions was achieved, tripling the 2022 volume (57 GWh). This improvement in the organised market liquidity can also be seen when expressed in terms of the transmission grid demand (0.4% in 2023 versus 0.1% in 2022) as well as a percentage of the total exchanges between agents in VTP (1.6% in 2023 versus 0.6% in 2022).

The share of the TSO balancing actions in the overall transactions volume in the organised market decreased significantly in 2023, representing 36% of the total compared to 82% in the previous year. This happened despite the 30 % increase in the absolute volume of TSO balancing actions (61 GWh). The relative weight reduction of the TSO balancing actions is exclusively due to a general improvement in the market dynamic, since the volume of transactions in organised market, without the TSO intervention, had a tenfold increase in comparison to 2022, reaching a 109 GWh volume.

Unlike in Spain, the Portuguese market has a high supply concentration level, which is almost entirely ensured by the four largest market agents¹⁵⁶. This context in the Portuguese market¹⁵⁷ makes bilateral contracts more frequent than in Spain¹⁵⁸, which does not help increase the liquidity of the organised market. Liquidity has mainly been used for some surplus swaps between agents.

In terms of price, the weighted average of all transactions in 2023 was 37.3 EUR/MWh, clearly below the 102.3 EUR/MWh from the previous year, and also below the arithmetic average of the reference price in D+1 product in Spain (39.3 EUR/MWh).

¹⁵⁵ Although it is the same platform used for the Spanish market, trading of products with delivery in Portugal has separate rules but very similar to those applied in Spain.

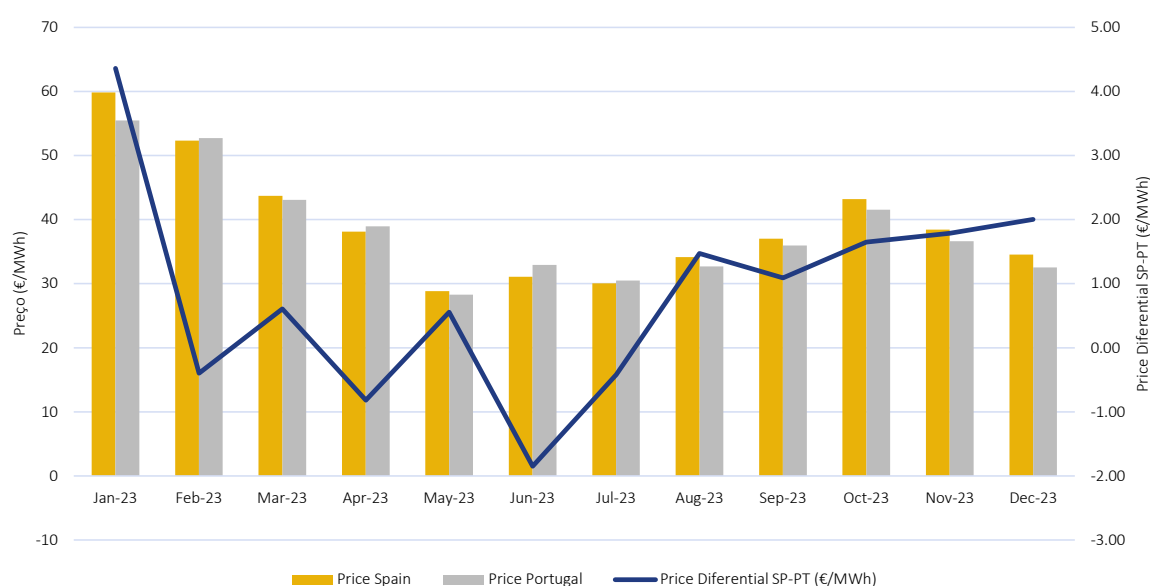
¹⁵⁶ Galp, EDP, Endesa e Naturgy are responsible for around 96% of the injections in the gas transmission grid.

¹⁵⁷ The remaining 4% were ensured by around 12 market agents.

¹⁵⁸ The MIBGAS platform records almost 200 registered market agents.

Figure 4-13 shows that there is a reasonable correlation of monthly prices¹⁵⁹ in the Spanish and Portuguese organised markets throughout 2023, and that the price differential between Spain and Portugal varied between -1.8EUR/MWh in June (cheaper in Spain) and 4.4 EUR/MWh in January (cheaper in Portugal). These comparisons should, however, be seen cautiously, taking into account the reduced liquidity in the Portuguese organised market, as well as the liquidity concentration in certain periods. Even so, having a cheaper average price in Portugal is in line with the net exports in the Spanish interconnection in 2023.

Figure 4-13 – Organised market prices in Spain and Portugal, 2023



Throughout 2023, the obligation to act as market maker for entities classified as dominant operator was regulated¹⁶⁰. Dominant operators initiated the market making activity in the beginning of 2024, which will contribute to an improvement in the organised market liquidity and to a more consistent and daily basis process of an explicit wholesale market price formation in Portugal, which was not yet possible in 2023.

Given that Portugal does not generate natural gas, negotiation and supply are the first stage of the sector's value chain. In this context, the supply of natural gas to the Portuguese market is made through entries in the interconnection with Spain (Campo Maior and Valença) and the Sines port (LNG), with some long-term contracts still existing.

¹⁵⁹ For Spain, an arithmetic average of the D+1 product reference price was used, while for Portugal the weighted average price was used for all transactions.

¹⁶⁰ GALP and EDP were classified as dominant operators for reaching, according to Decree Law no. 70/2022, of 14 de October, a market share above 20% in entry nominations or in supplied gas volume to end users or in number of clients.

Entries through the GNL terminal became predominant in more recent years. In fact, natural gas supply through interconnections with Spain became less significant and corresponds, in part, to smaller agents in the Portuguese market that bring gas from Spain benefiting from its more liquid and origin diversified wholesale market.

In 2023, a net exporting flow was registered in the international interconnections, meaning that the total entries volume in the transmission grid from LNG allowed to supply all the national consumption and also to export gas to Spain through pipeline.

Supply through the LNG terminal is partly based on LNG contracts with Nigeria, with take or pay clauses. These contracts follow the pricing rules defined in the contracts, with an underlying volume of around 2.9 bcm on an annual basis

TRANSPARENCY

Although there is an ongoing process to implement transparency and integrity rules at the European level, it is recognised that the use of long-term natural gas contracting mechanisms hinders the transparency and symmetry of the information on the market. This is also the case in the natural gas sector in Portugal, where despite the existence of regulated mechanisms for wholesale contracting, information about market operation is still scarce.

Nevertheless, on 5 October 2015, reporting began on transactions and orders to trade regarding contracts negotiated in organised market platforms, in accordance to the schedule laid down in Article 12 of Commission Implementing Regulation (EU) No. 1348/2014.

From 7 April 2016, the reporting of transactions and negotiation orders of natural gas transmission contracts was introduced. These contracts were made following a capacity allocation by the TSO, as well as contracts negotiated outside the market platforms throughout the European Union, in accordance with the schedule laid down in Article 12 of Commission Implementing Regulation (EU) No. 1348/2014, as well as other relevant market information relating to the use of LNG and natural gas storage infrastructures and the loading and unloading operations by methane carriers.

Among the facts subject to the reporting obligation are planned and unplanned unavailability of the networks, GNL or storage assets, that may affect consumption or price. Any changes that affect the commercially available capacity in the Portugal-Spain interconnection (VIP) are also subject to reporting by

REN, as GTG. This reporting must also take place in cases of significant deviations of either system aggregate or agent-specific consumption forecasts.

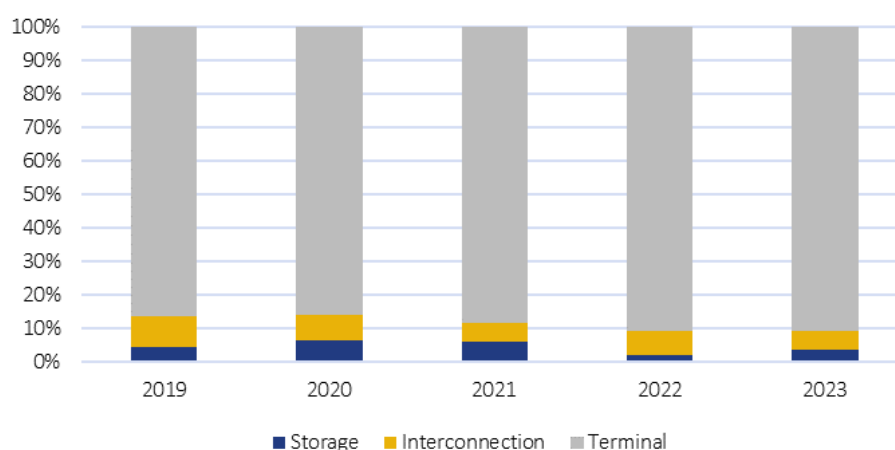
Inside information is communicated in a centralised portal ran by REN ¹⁶¹. During 2023, there were 134 inside information entries. The large majority of those is related to underground storage unavailability.

In relation to the development of more short-term organised markets, on 16 March 2021 trading began for spot products with delivery in Portugal, which was a necessary step for creating a price reference for natural gas trading in Portugal and to increase trading volumes, both in the spot and futures markets. However, in spite of the general improvement in 2023, liquidity is still incipient, which makes it difficult for a sound and consistent price reference to emerge. The beginning of operations of the mandatory market makers in 2024 provides some prospects for the increase of the trading frequency in 2024, as well as more aligned prices between the Portuguese and Spanish markets.

NATURAL GAS SUPPLY

The breakdown of natural gas injections in the transmission grid is described in Figure 4-14.

Figure 4-14 – Breakdown of transmission grid injections by infrastructure, 2019 to 2023



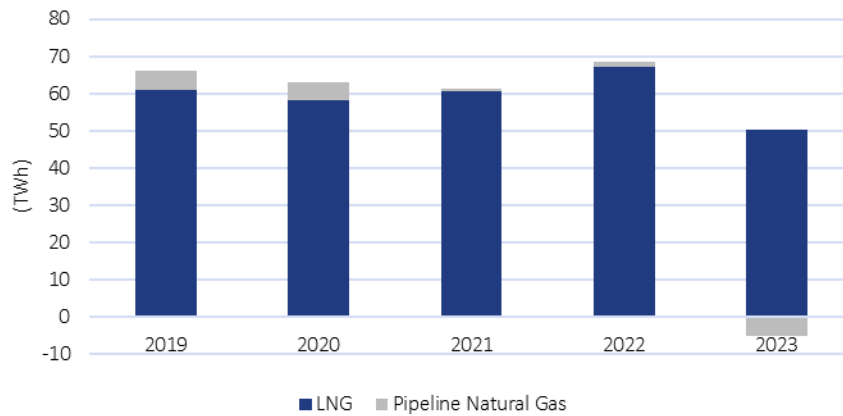
Source: REN Gasodutos, REN Armazenamento, and REN Atlântico data

¹⁶¹ <https://mercado.ren.pt/EN/Gas/MarketInfo/UMMs/Pages/default.aspx>

The Sines Terminal continued to be the main source of supply in 2023, representing around 91% of the total gas volume that entered the national grid.

Figure 4-15 shows the evolution of the volumes of the natural gas import balance. In 2023, 45 TWh were imported. The net import by pipeline was negative for the first time since 2019.

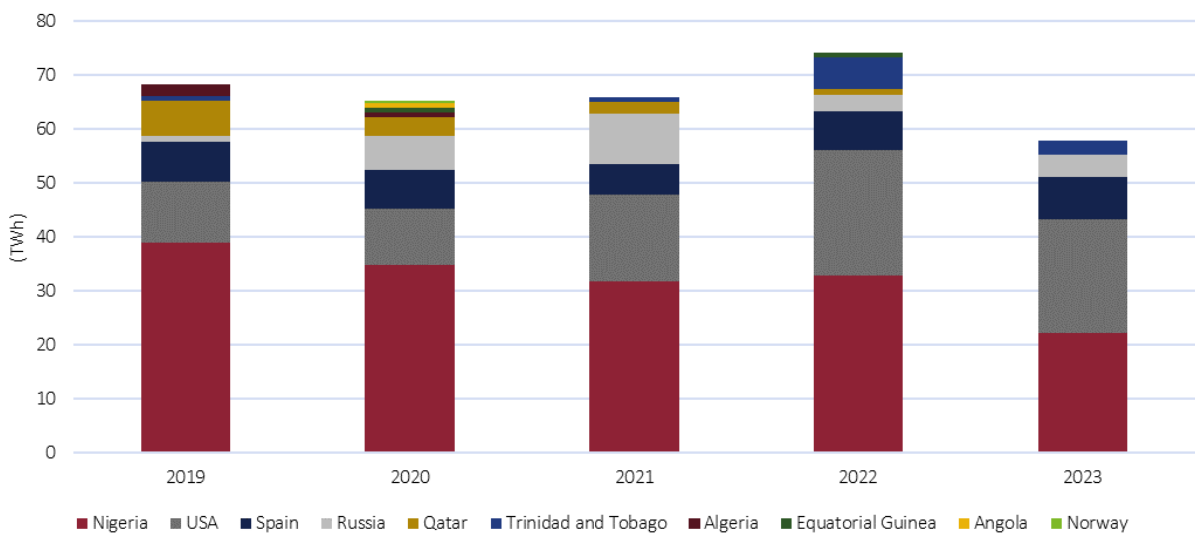
Figure 4-15 – Evolution of imported volumes of natural gas, 2019 to 2023



Source: EUROSTAT, Elaboration ERSE

Figure 4-16 shows the breakdown of natural gas origin from 2019 to 2023.

Figure 4-16 – Origin of imported natural gas, 2019 to 2023



Source: EUROSTAT, Elaboration ERSE

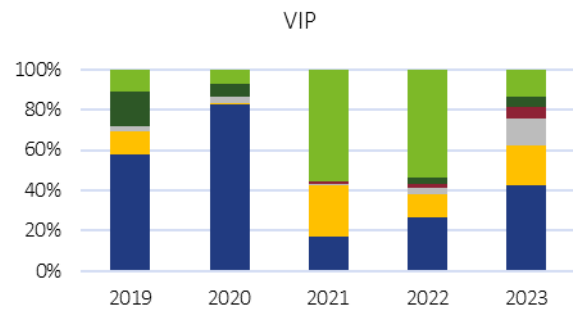
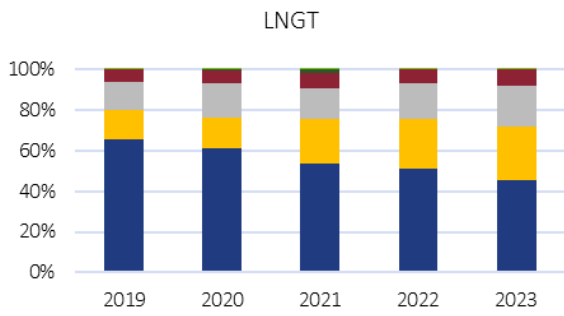
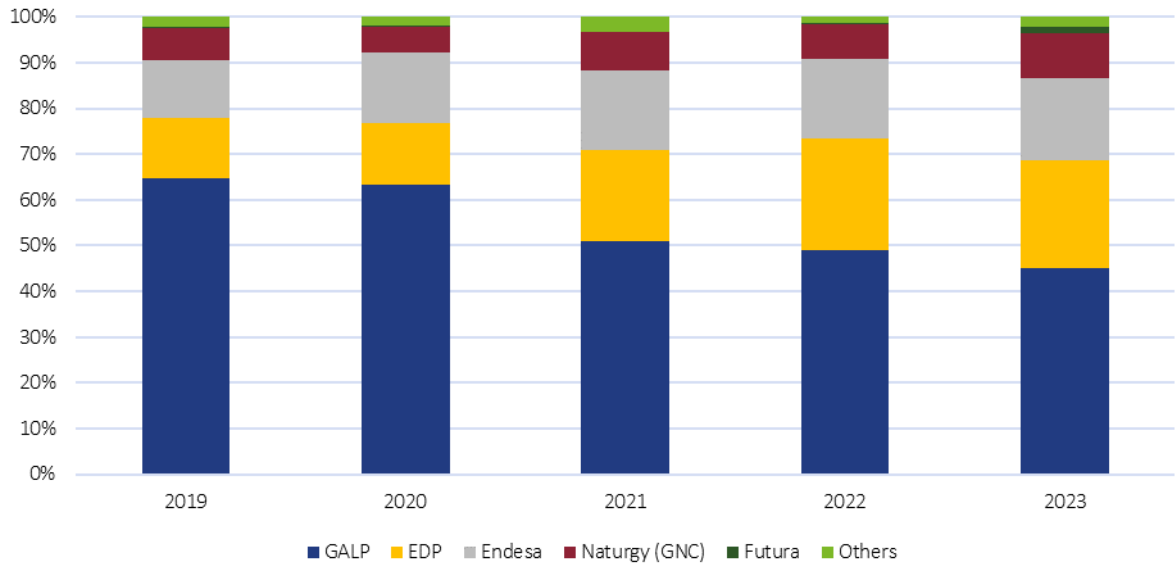
The main supply source in 2023 was again Nigeria, but with figures very close to those of USA, which, in relative terms, continued the tendency registered in the past five years to improve its position. Spain reinforced the third position as supply source. Trinidad and Tobago and Russia swapped positions again, with the latter assuming the fourth position again.

EFFECTIVENESS OF COMPETITION

Figure 4-17 shows the natural gas inflows by agent into the RNTGN considering the interconnections by pipeline (VIP) and the Sines terminal (LNGT) between 2019 and 2023, by agent¹⁶², as well as details of entries only into VIP and from LNGT.

¹⁶² Total entries consider allocations to market agents, excluding allocations to GTG that are not due to commercial reasons, and allocations by economic group are considered with the exception of those corresponding to allocations to SRBs, which are accounted for separately.

Figure 4-17 – Entries in RNTG (LNGT+VIP), 2019 to 2023



■ GALP ■ EDP ■ Endesa ■ Naturgy (GNC) ■ AXPO/GOLD ■ Others

■ GALP ■ Naturgy (GNC) ■ Futura ■ AUDAX ■ AXPO/GOLD ■ Others

Source: REN, Elaboration ERSE

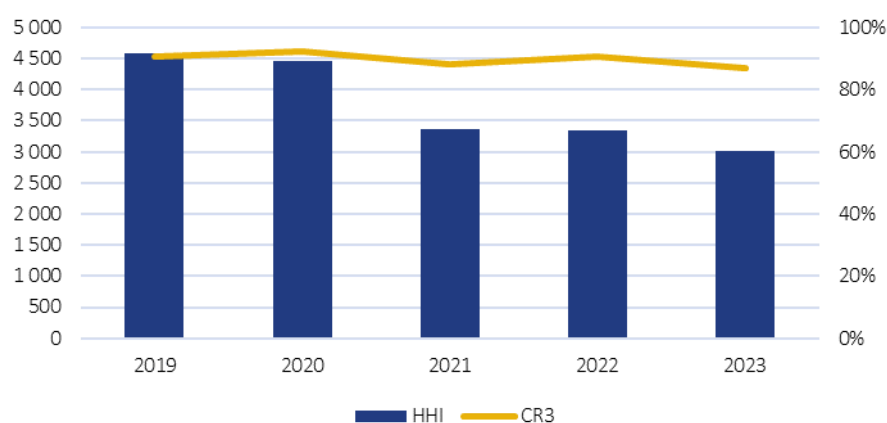
Galp continued the trend registered in the last five years, of reducing its relative weight in total RNTG entries, registering in 2023, a share of 45% of the entries. Conversely, EDP and Endesa registered a growth trend in the same period.

The inflows behaviour from LNGT is very similar to that of total inflows. Galp registered, for the first time in the analysed period, a share below 50%, also on LNGT entries.

In VIP imports, the graph is affected by the fact that EDP and Endesa are not being represented individually¹⁶³ since they are not among the top 5 suppliers nominating entries. In this context, the weight of the “Others” category is abnormally high in 2021 and 2022, when these two suppliers registered relevant market shares. On the other hand, in 2023, Futura and Audax appear as the third and fourth largest importers in VIP, respectively, while they have registered low market shares in previous years.

Figure 4-18 shows the concentration indexes, HHI and CR3¹⁶⁴, in the RNTG (LNGT + VIP) entries between 2019 and 2023.

Figure 4-18 – Concentration indexes in RNTG (LNGT + VIP) entries, 2019 to 2023



Source: REN, Elaboration ERSE

The HHI value has registered a consistent decrease since 2019, when reached its highest value in the analysed period¹⁶⁵, until 2023, when it approached 3 000. For the CR3, the decrease is not as steep as for the HHI, due to the fact that GALP’s loss of market share has benefited mainly the second and third place suppliers.

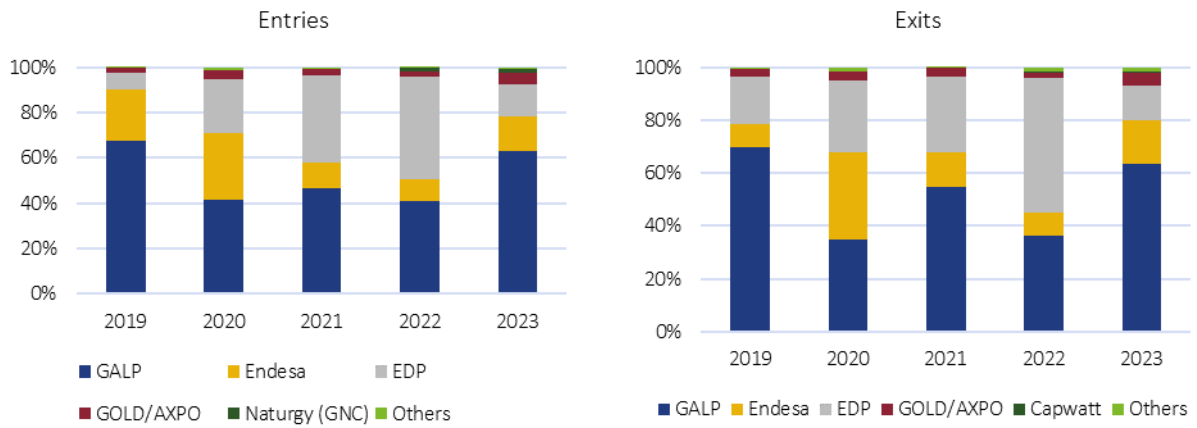
Figure 4-19 shows the use of underground storage between 2019 and 2023.

¹⁶³ The option was to individualise agents with the biggest market shares into the last year of the period in analysis.

¹⁶⁴ The CR3 index refers to the market share of the three largest market agents.

¹⁶⁵ The HHI value in 2019 is about 4.500, which is already well below the 2018 value, which was higher than 5.500.

Figure 4-19 – Use of underground storage, 2019 to 2023

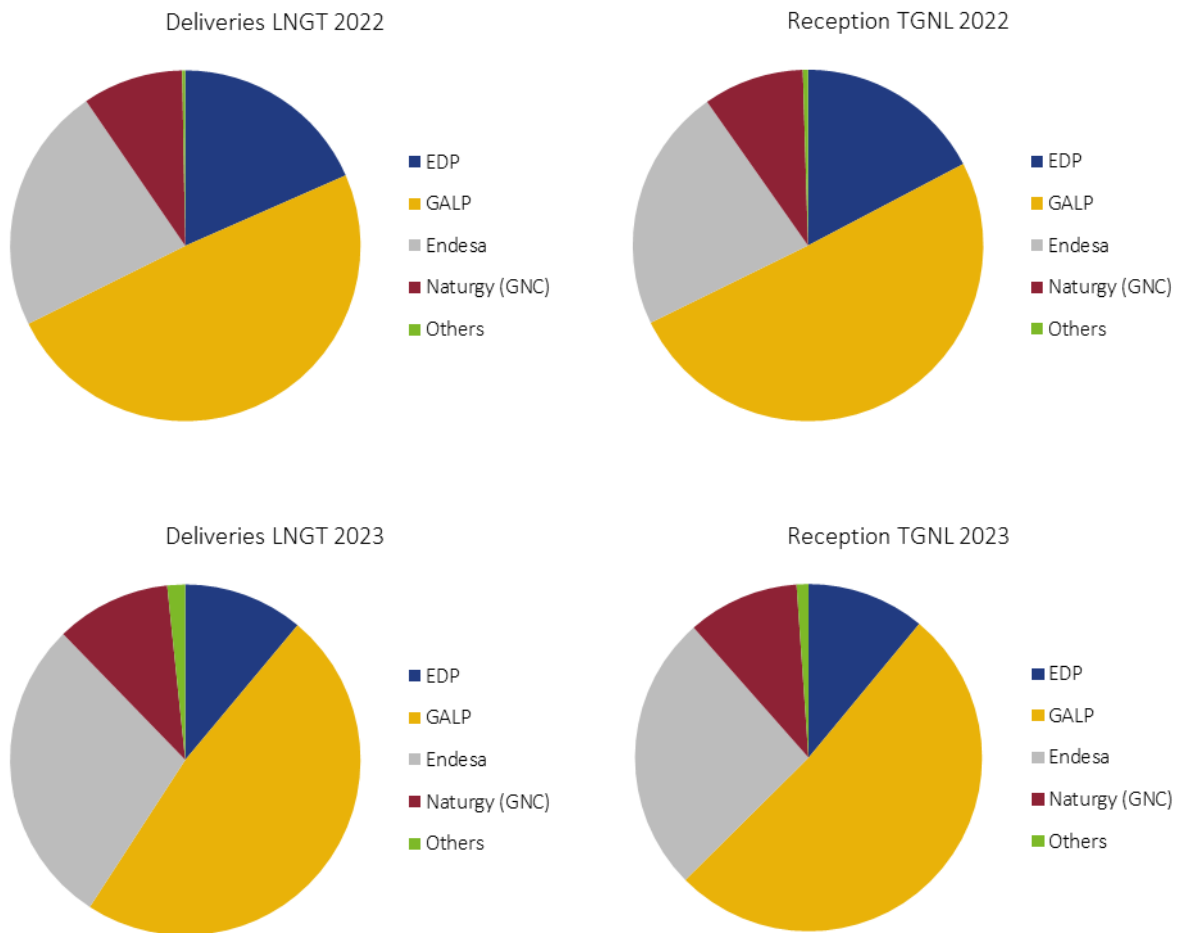


Source: REN, Elaboration ERSE

With regard to inflows and outflows in underground storage, in 2023 GALP reclaimed its position as the main user, while Endesa passed to second and EDP to third place. The relative weight of the remaining users continued at residual levels.

Figure 4-20 shows the market shares of LNG swaps at the Sines terminal, in 2022 and 2023.

Figure 4-20 – Swaps in LNGT, 2022 and 2023



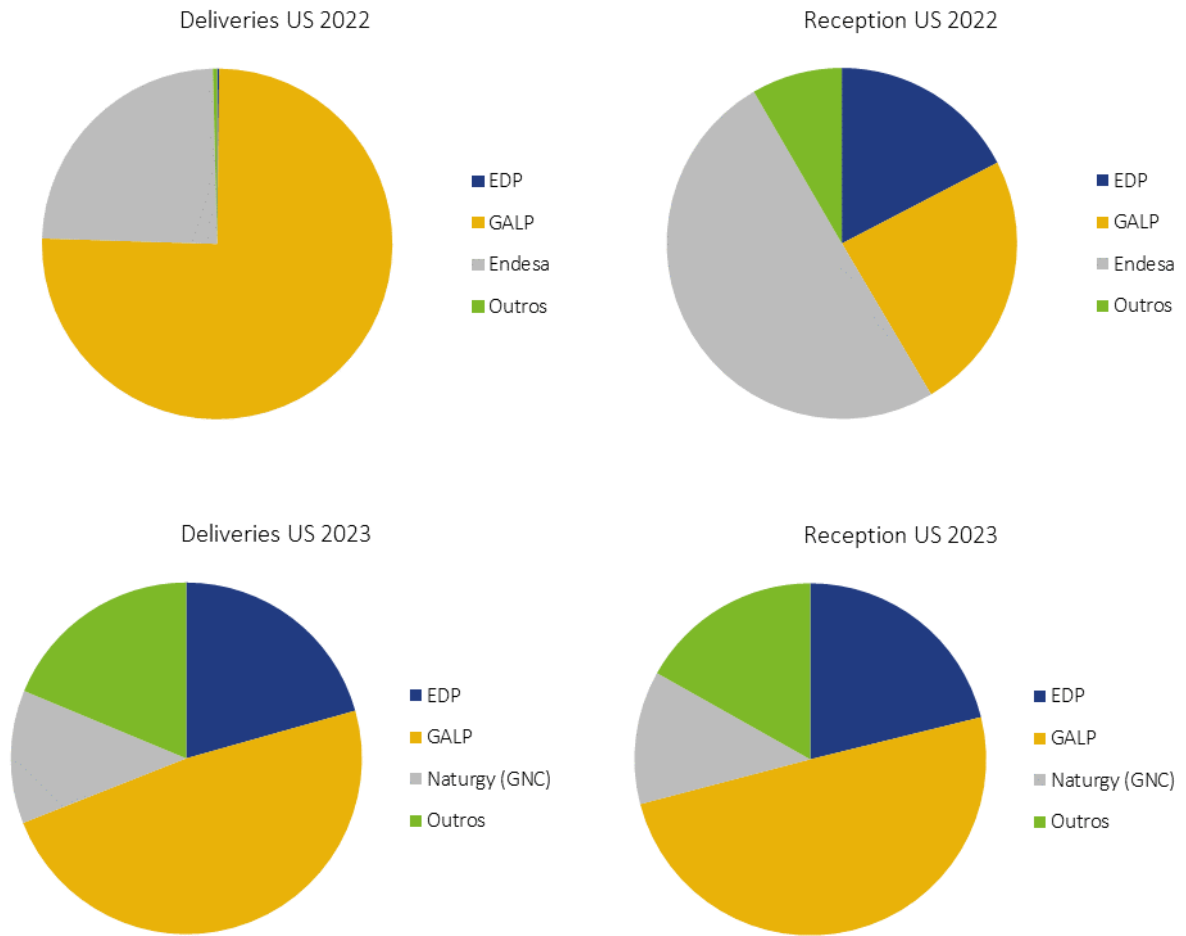
Source: REN, Elaboration ERSE

In 2023, no significant changes were registered in relation to the main agents involved in commercial swaps in the LNGT. Endesa increased its relative weight in the total volume of swaps, mainly at the expense of EDP's reduction.

The swaps in the terminal seem to be intertemporal swaps, given that the supply weights are very similar to the weights of the volumes received.

Figure 4-21 shows the market share of natural gas swaps in underground storage (US) in 2022 and 2023.

Figure 4-21 – Swaps in underground storage, 2022 and 2023



Source: REN, Elaboration ERSE

Also, in underground storage, a great balance is registered between market shares of each agent in deliveries and receptions, which, once again, points out to a logic of intertemporal swaps between agents. In 2023, a greater dispersion of the involved agents in underground storage swaps was registered, in comparison with 2022.

Figure 4-22 shows the market share of natural gas swaps in the Virtual Trading Point (VTP), in 2022 and 2023.

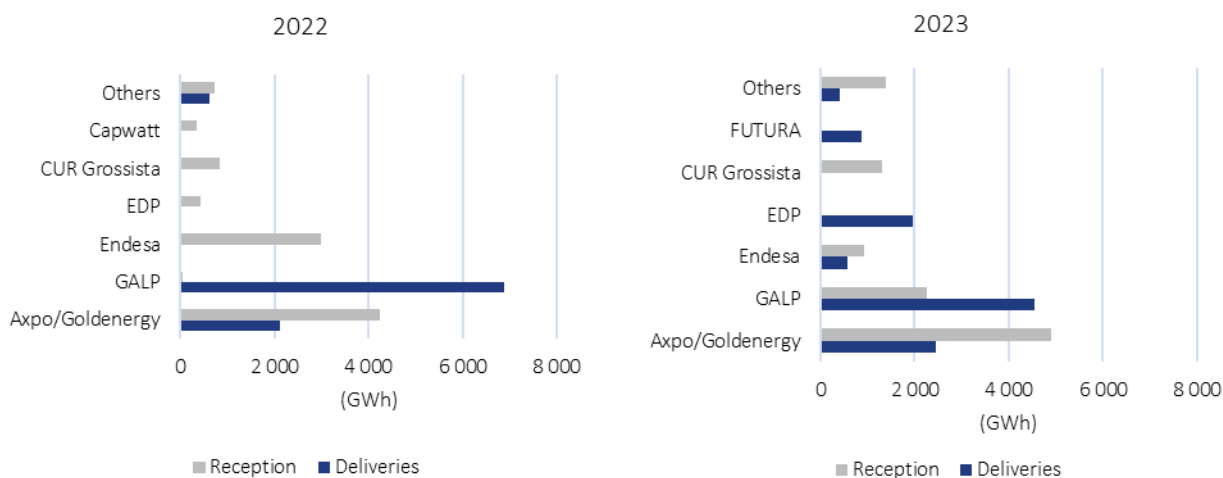
Figure 4-22 – Swaps in VTP, 2022 and 2023



Source: REN, Elaboration ERSE

The swaps in the VTP in 2023 evolved towards a greater dispersion of market share values. In deliveries, GALP decreased its market share in 2023 to a value clearly below 50%, most of it due to the growth of EDP, Futura and agents under the “Others” category. In receptions, the AXPO group kept the greatest market share, while GALP registered a steep increase which compares to EDP and Endesa’s strong decrease.

Figure 4-23 – Exchanges in volume (VTP), 2022 and 2023



Source: REN, Elaboration ERSE

Figure 4-23 shows that in 2022 GALP passed from an almost exclusively selling position in the VTP (7 TWh), to a much more balanced position between receptions and deliveries in 2023 (2 TWh in net sales).

In the opposite direction, EDP and Endesa, moved from an almost exclusively buying position to an exclusively selling position, in the case of EDP, and to a balanced position between receptions and deliveries, in the case of Endesa.

AXPO group and the wholesale supplier of last resort reinforced their net acquisitions, while FUTURA had a sales increase which makes it the fifth most active agent in VTP in 2023. The TSO actions in the VTP continued, as in 2022, having little representation and are included in “Others” category.

4.2.1.2 REGULATORY DEVELOPMENTS

IMPLEMENTATION OF THE DOMINANT OPERATOR CONCEPT

In 2023, ERSE approved Directive o.r 7/2023, of 28 February, that established the rules to define the entities to include in the list of dominant operators, as foreseen in Decree Law no. 70/2022, of 14 de October.

Still in 2023, Order no. 7310/2023, of 11 July, was published, establishing the applicable conditions to SNG dominant operators while performing the market maker service, including the obligation to present a certain volume of bid and ask offers separated by a maximum price difference.

ORGANISED MARKET TRADING RULES

Directive no. 16/2023, of 30 August, updated some aspects of the trading rules in MIBGAS platform for products with VTP delivery, including the introduction of the enterprise group concept, the computation rules of the last price or the introduction of two new price indexes.

4.2.2 RETAIL MARKET

In 2023, the natural gas retail market had a considerable decrease in natural gas prices, after the sharp increase that was verified in 2022 due to the energy crisis. However, prices were still above the prices of the last quarter of 2021.

As regards gas retail markets, although the decrease in consumption market penetration was small, there was a significant reduction in the market penetration for the number of customers, especially due to the increase in natural gas prices and the possibility for customers with consumption up to 10,000 m³ to return to the regulated market, which was established by the Decree Law no. 57-B/2022, of 6 September.

By the end of 2023, nearly 96% of gas consumption (excluding electricity power plants) was supplied by market agents. However, the weight of customers decreased from 85% in 2022 to 76% in 2023.

In 2023, the liberalised gas retail market had 20 suppliers, 18 of which supplying consumers with consumption below 500 m³/year (residential customers).

4.2.2.1 MONITORING THE PRICE LEVEL, TRANSPARENCY LEVEL AND THE LEVEL AND EFFECTIVENESS OF MARKET OPENING AND COMPETITION

METHODOLOGY FOR MONITORING REFERENCE PRICES AND AVERAGE PRICES CHARGED IN THE RETAIL MARKET

Under the obligations of price disclosure by the suppliers, as well as ERSE's responsibility to monitor the natural gas market and information to consumers and other agents on prices charged, suppliers send ERSE information on the average prices charged in the retail market¹⁶⁶, as well as updated information regarding

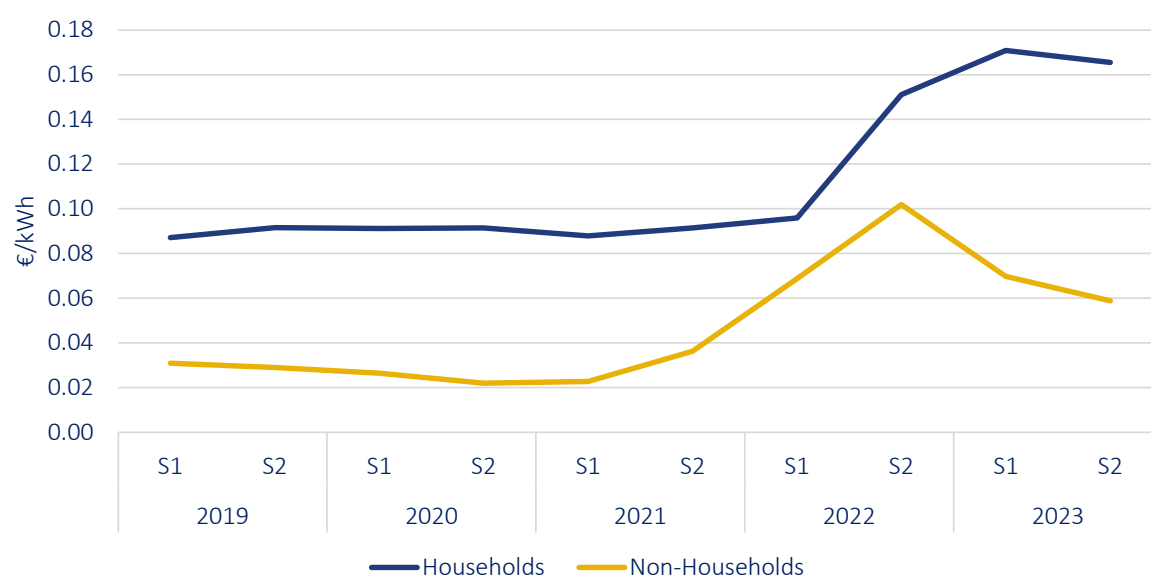
¹⁶⁶ Pursuant to [Order no. 3677/2011](#), of 24 February. In September 2023, ERSE began revising this Order, through Consultation of Interested Parties No. 7/2023, which ended in 2024.

the reference prices they charge or expect to charge, for the supply of natural gas at low pressure with an annual consumption lower than or equal to 10 000 m³ (LP<).

Information regarding the average prices charged in the retail market, reported on a quarterly basis by natural gas suppliers to ERSE, is used by ERSE to monitor and supervise the retail natural gas market, and also serves as an information tool for the reports produced by official statistical data bodies (INE or EUROSTAT, for example).

Figure 4-24 highlights the evolution of natural gas prices both for household consumers and non-household consumers. It is worth noting that the prices presented in this figure include VAT, taxes and other levies for household consumers, but exclude VAT for non-household consumers.

Figure 4-24 – Evolution of natural gas average prices for household consumers (with VAT, taxes and other levies) and non-household consumers (without VAT)



Source: Eurostat, ERSE

Reference prices are understood to be the set of tariffs, tariff options and respective prices and indexes per billing variable offered by suppliers to their customers, as well as the conditions for applying the tariffs, namely the characteristics of consumption, duration of contracts and conditions for the revision of prices. Reference prices constitute the supplier's basic offer, which does not prevent them from applying

differentiated special contractual conditions, such as the application of discounts or other promotional campaigns.

This information, which must be sent on an annual basis and whenever there is any change in prices or contractual conditions, is included in comparison and decision-making support tools for consumers made available by ERSE on its website¹⁶⁷, which are further detailed in the transparency chapter below. These tools are complemented with the publication of quarterly newsletters about the reference market prices in LP¹⁶⁸.

The analysis carried out on the commercial offers made available by the suppliers revealed that, in December 2023, for the most representative consumer type in the household segment¹⁶⁹, there were 12 suppliers with gas offers and eight suppliers with dual offers, with a total of 66 offers (exclusively) for natural gas and 146 integrated offers for natural gas and electricity (dual), totalling 212 commercial offers, representing +30% compared to 2022 (163 commercial offers).

In that period, the natural gas commercial offer with the lowest monthly bill was 28.06 euros/month, corresponding to the Regulated Tariff. The natural gas commercial offer with the lowest monthly bill, in addition to the Regulated Tariff, was 37.44 euros/month (33% higher than the Regulated Tariff). It should be noted that the difference between the minimum value gas offer and the Regulated Tariff has been decreasing. The dual commercial offer with the lowest monthly bill was 114.16 euros/month, corresponding to a saving of 6.33 euros and 5% less than the Regulated Tariff.

Figure 4-25 shows the evolution of the monthly bill of the most competitive natural gas offer in 2023, showing that among the 12 suppliers with gas offers and the eight suppliers with dual offers, there is no commercial natural gas offer more competitive than the Regulated Tariff.

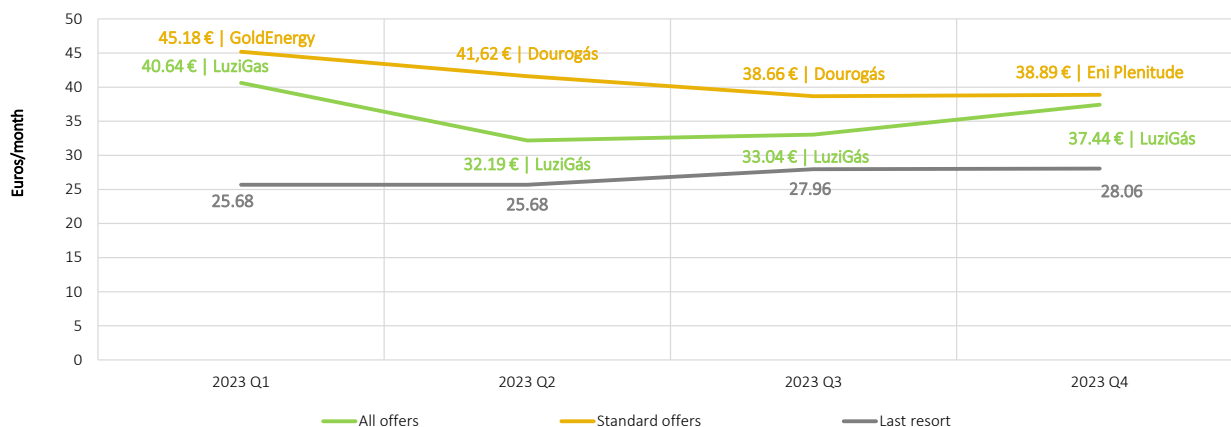
With regard to dual offers, Figure 4 26 shows that in the 1st quarter of 2023, the minimum value standard offer is higher than the Regulated Market tariff for type 2 consumers. From the 2nd quarter of 2023 onwards, the standard offer is more competitively priced than the Regulated Tariff for type 2 consumers. Based on all the commercial offers, it can be seen that the best offer has a lower price than the Regulated Tariff throughout the period analysed.

¹⁶⁷ At <https://simulador.precos.erse.pt/>.

¹⁶⁸ Available at [Natural Gas Commercial Offers Newsletters](#).

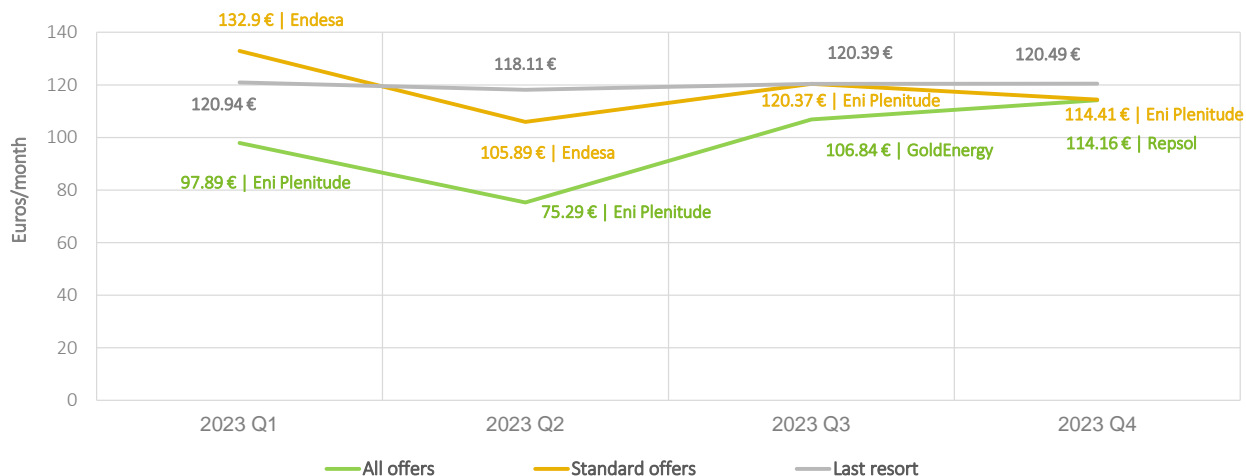
¹⁶⁹ Representative as regards energy units. Corresponds to consumer type 2 (couple with children and no central heating), with an annual natural gas consumption of 292 m³.

Figure 4-25 – Monthly invoicing of the most competitive gas offer for type 2 consumers in 2023



Source: Eurostat, ERSE.

Figure 4-26 – Monthly invoicing of the most competitive dual gas offer for type 2 consumers in 2023



Source: ERSE

Prices shown include applicable taxes and fees, except the Energy and Geology Tax (DGEG) for electricity and the underground occupancy tax for natural gas. In addition, the analysis carried out includes all commercial offers, i.e. in addition to standard offers (without any restrictions), it includes conditional offers

(with contractual conditions that condition the subscription to the general public, such as offers that require the establishment of partnerships with other institutions or offers that require compliance with other conditions). It also covers offers with loyalty (require them to stay for a previously established period, with the existence of penalties in the event of early termination of the contract) and indexed offers (offers with price indexing mechanisms to wholesale energy markets). Commercial offers with mandatory additional services are not considered.

TRANSPARENCY

In an effort to continue providing information about reference market prices to natural gas consumers, as well as IT tools which help consumers choose their supplier, ERSE provides an online comparison tool on its website that allows for the comparison of market prices offered in mainland Portugal for facilities in LP¹⁷⁰. The price comparison tool compares the prices offered by all registered suppliers operating in mainland Portugal¹⁷¹, allowing consumers to choose their natural gas supplier by comparing the prices and the commercial conditions offered by each supplier.

Since August 2022, ERSE has made a list of “Energy Offer Prices”¹⁷² available to the consumer, which helps to find the best offer on the market and to monitor the rapid evolution of the electricity and natural gas retail markets.

In order to guarantee the transparency of the information made available to consumers by suppliers, ERSE verifies that suppliers disclose on their websites the offers which are being practised on the market, in terms of both price and commercial conditions, and that they are in line with the information on reference prices sent to ERSE as part of its monitoring. In situations where there are discrepancies or gaps, ERSE reserves the right not to publish the commercial offers in its comparison tool until the problems identified are resolved by the suppliers.

In addition to the comparison tool, ERSE also makes available on its website all reference price information and other contractual conditions that serve as the basis for the operation of the comparison tool¹⁷³, to ensure access to information for all interested parties, in an editable format.

¹⁷⁰ Available at <https://www.erse.pt/simuladores/precos-de-energia/>

¹⁷¹ Natural gas supply in the Autonomous Regions is not subject to ERSE regulation.

¹⁷² Available at: <https://www.erse.pt/simuladores/lista-de-precos-de-ofertas-comerciais/>.

¹⁷³ The document is available at: <https://www.erse.pt/simuladores/precos-de-energia/>.

In addition, suppliers wishing to serve BP< customers must make publicly available, in particular through their websites, public offers for the supply of natural gas, as well as the general conditions of contracts for these customers¹⁷⁴.

Rules are also in force regarding the information to be made available on customer invoices, namely information regarding the invoice frequency, information on the share of access tariffs, indication on the volume of natural gas measured and energy conversion factors (from physical units, m³ to energy units, kWh)¹⁷⁵, and the labelling of natural gas.

The rules for access to information regarding natural gas consumption by customers are regulated by ERSE under the terms of the Measuring, Reading and Data Availability Guide¹⁷⁶.

Since 2017, ERSE provides a social tariff calculator¹⁷⁷, an instrument that allows beneficiaries of the social tariff to understand and verify social tariff discounts on natural gas bills. This calculator is updated periodically with the tariffs' prices approved by ERSE.

In 2020, ERSE introduced a new feature on its website that allows any natural gas consumer to estimate the cost associated with the Underground Occupancy Tax (TOS). More specifically, ERSE offers a TOS Simulator¹⁷⁸, which enables consumers, in a simplified and intuitive way, to estimate the costs arising from TOS according to four aspects: municipality of residence, level of pressure, period of consumption and consumption in the period.

EFFECTIVENESS OF COMPETITION

Regarding the level of market openness, Figure 4-27 shows the consumption market share that was supplied by the liberalised market, showing that 98% of total consumption¹⁷⁹ was ensured by market suppliers. This figure is even higher in the areas covered by the main natural gas DSOs.

¹⁷⁴ Under the terms of no 15, paragraph 1 of the Commercial Relations Code, approved by Regulation no. 827/2023, of 28 July, in conjunction with Declaration of Rectification no. 830/2023, of 31 October.

¹⁷⁵ Natural gas is billed in €/kWh, pursuant to Article 22 of ERSE's Gas Tariffs Code (approved by Regulation No. 648/2021, of 28 April).

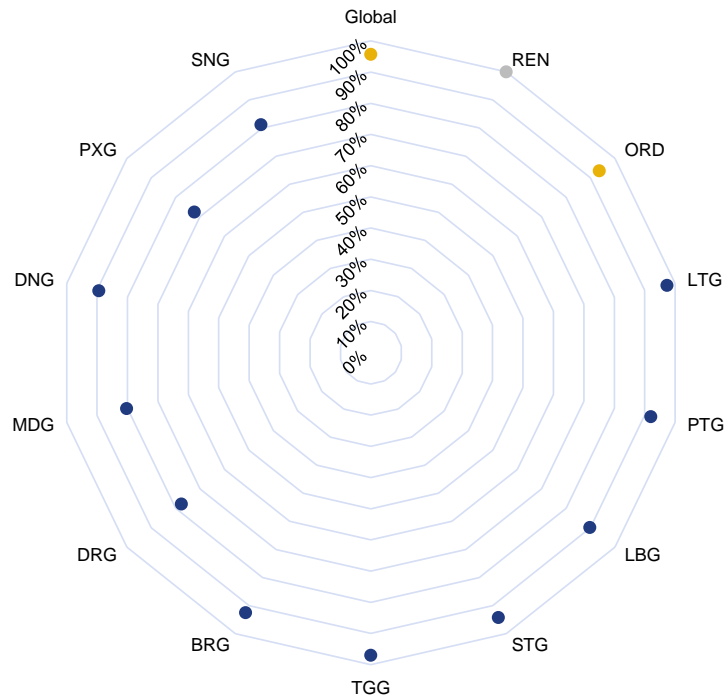
¹⁷⁶ Approved by [Directive no. 7/2018, of 28 March](#).

¹⁷⁷ Available at: https://www.erse.pt/media/1jshsbih/desconto-tarifa-social-t1_2024-g%C3%A1s.xlsx.

¹⁷⁸ Available at: <https://www.erse.pt/simuladores/taxa-de-ocupacao-do-subsolo/>

¹⁷⁹ Excluding power plants, due to their significant volume in terms of consumption.

Figure 4-27 – Liberalised market penetration by DSO and TSO (total energy consumption, excluding electricity-generating plants), 2023

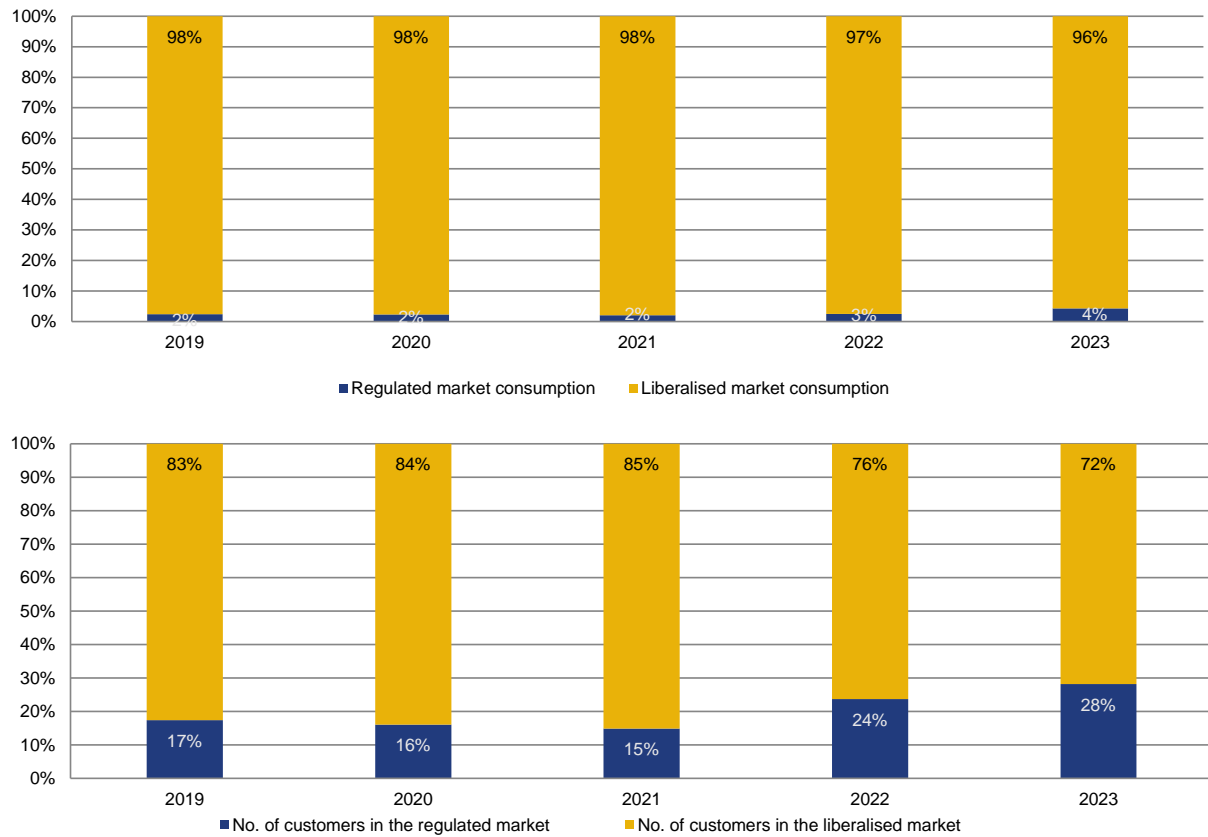


Source: OLMC data

Note: BRG – Beiragás, DNG – Dianagás; DRG – Duriensegás; LBG – Lisboaág; LTG – Lusitaniagás; MDG – Medigás; PTG – REN Portgás; PXG – Paxgás; SNG – Sonorgás; STG – Setgás; TGG – Tagusgás; REN – REN Gasodutos; DSO – Distribution System Operators as a whole; Global – DSOs and REN.

The evolution of the liberalised market between 2019 and 2023 can be seen in Figure 4-28.

Figure 4-28 – Breakdown of consumption between the regulated and the liberalised markets, 2019 to 2023

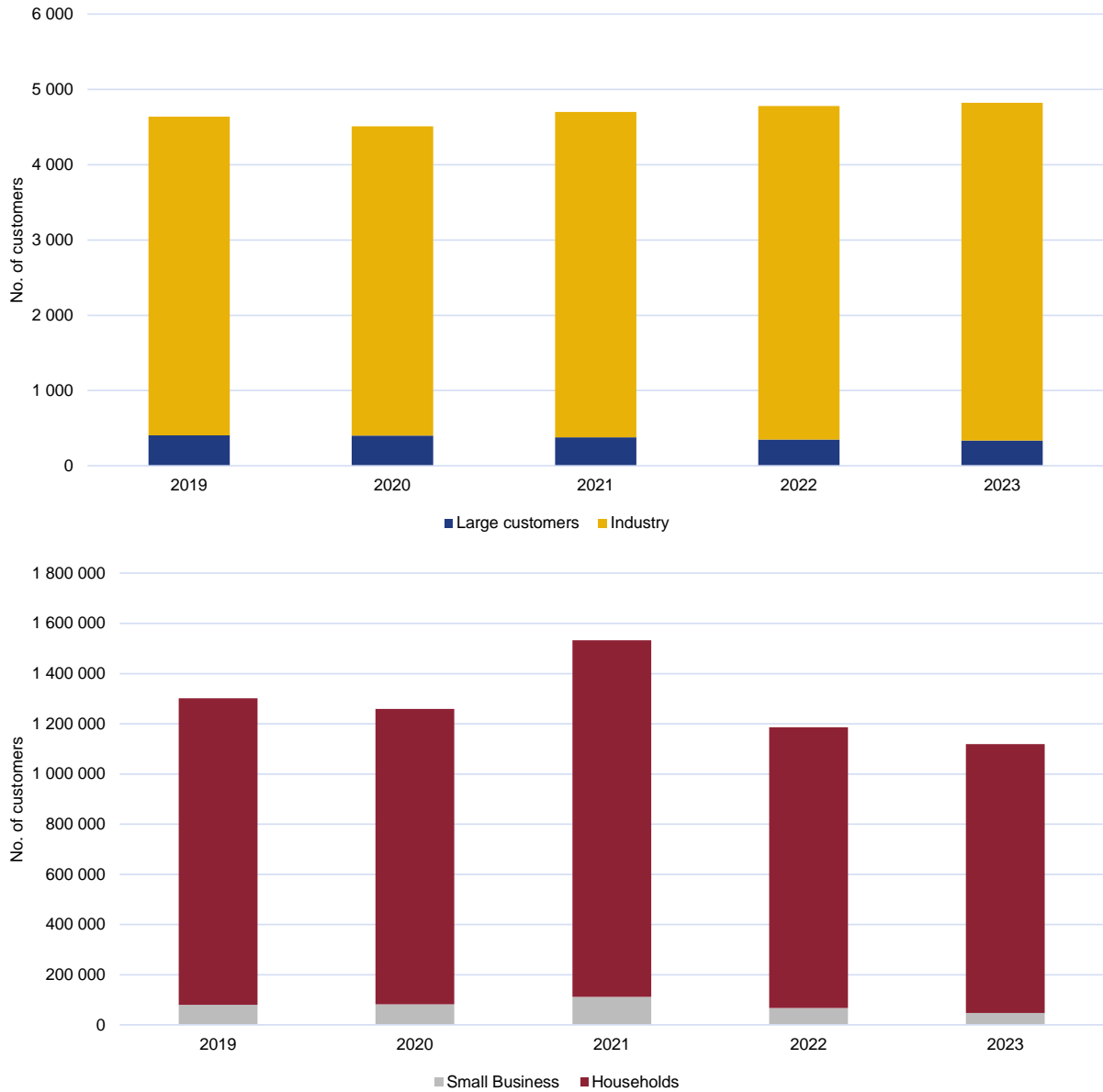


Source: OLMC data

Regarding the number of customers, the possibility of returning to the regulated market, which was given to customers with consumption up to 10.000 m³/year, was the main reason behind the decrease in the weight of the liberalised market in 2023.

In 2023, there was a decrease of close to 4% in the number of customers supplied by the liberalised market (see Figure 4-29), which meant 72% of the customers were in that market.

Figure 4-29 – Evolution of the liberalised market in mainland Portugal, 2019 to 2023

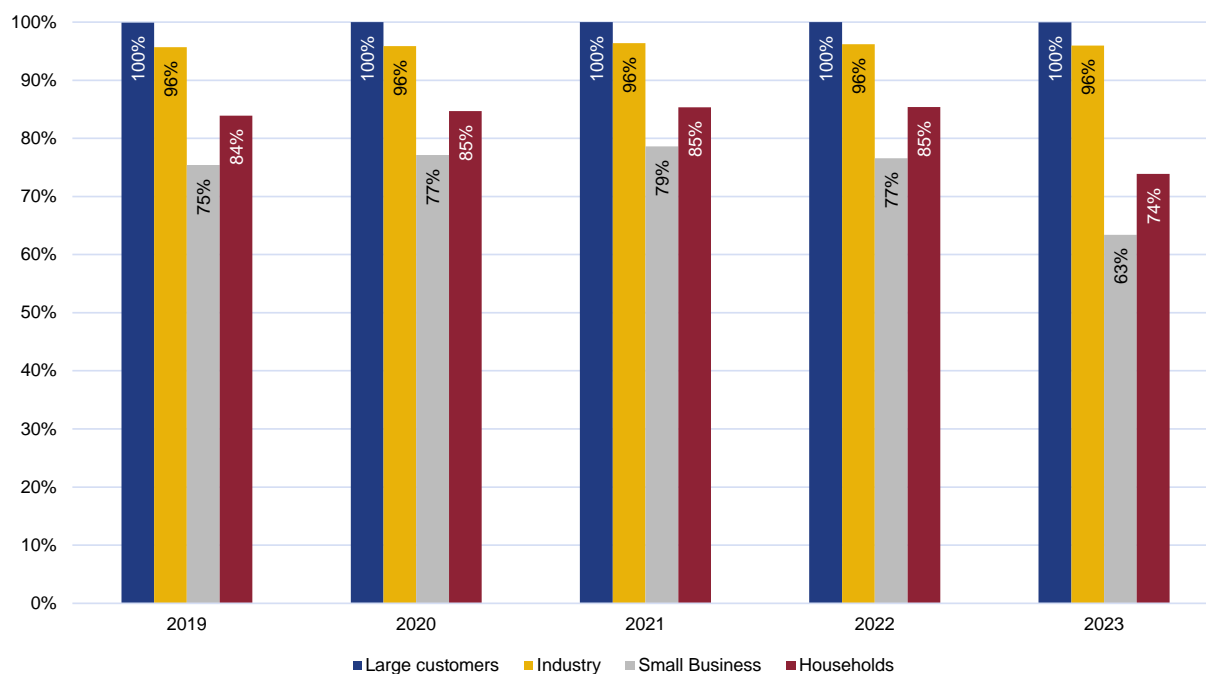


Source: OLMC data

The figure above also shows that, in 2024, large consumers (annual consumption above 1 million m³) were the segment with the highest consumption, but decreased in number by 4.5% compared to 2022. On the other hand, the number of industrial customers increased by around 1.3%. Small companies and residential customers had very significant decreases, of 43.2% and 4.4%, respectively.

The consumption of each segment is shown in Figure 4-30. It can be seen that all large consumers are supplied by the liberalised market.

Figure 4-30 – Penetration of the liberalised market by customer segment, 2019 to 2023



Source: OLMC data

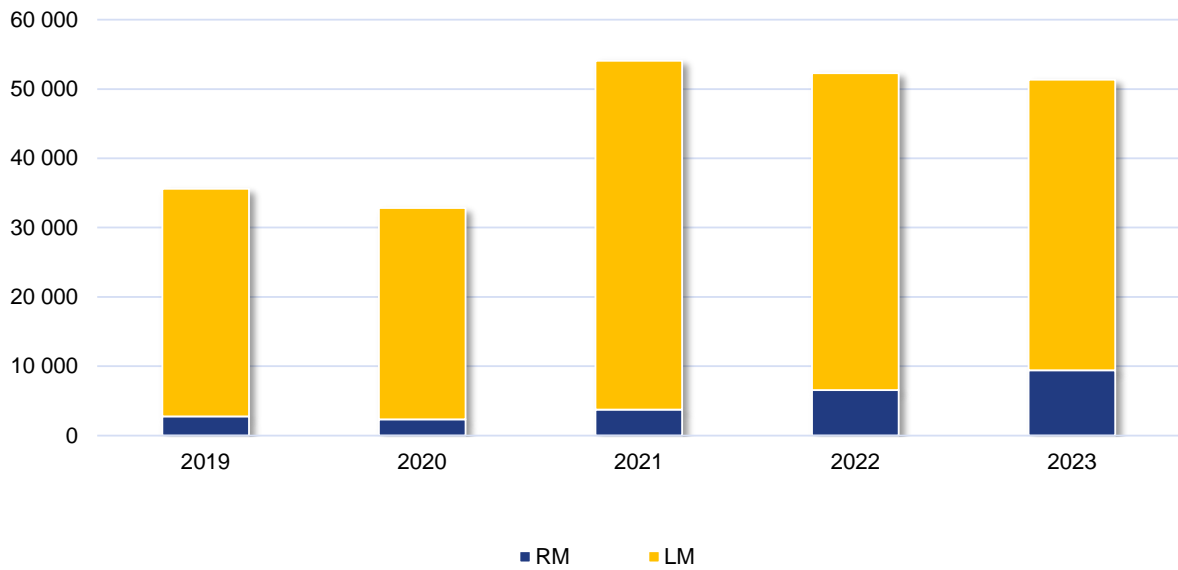
In the industrial customers' segment, more than 96% of their consumption is supplied by the liberalised market.

In terms of number of customers, the residential segment is the most significant segment in the natural gas market, but it only represents 6% of total consumption.

By the end of 2023, there were 51 365 natural gas consumers benefiting from the social tariff, 9 412 of them in the regulated market and 41 953 in the liberalised market, as can be seen in Figure 4-31.

Globally, this means that 4.3% of natural gas consumers have access to the social tariff. There were no significant changes in the number of beneficiaries of the social tariff between 2022 and 2023.

Figure 4-31 – Number of consumers on social tariffs, natural gas sector, 2019 to 2023

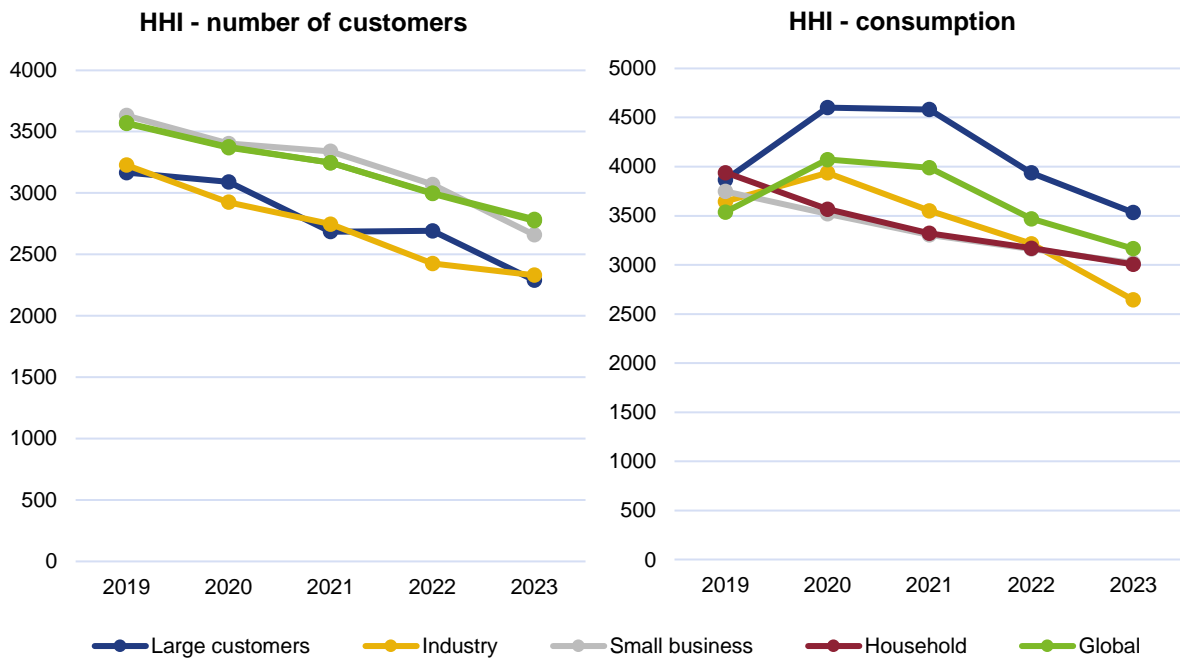


Source: Suppliers' data

Note: LM - liberalised market; RM - regulated market

Since 2019, the level of market concentration in the number of customers has been decreasing. In terms of consumption, that reduction has been observed since 2021, as Figure 4-32 shows.

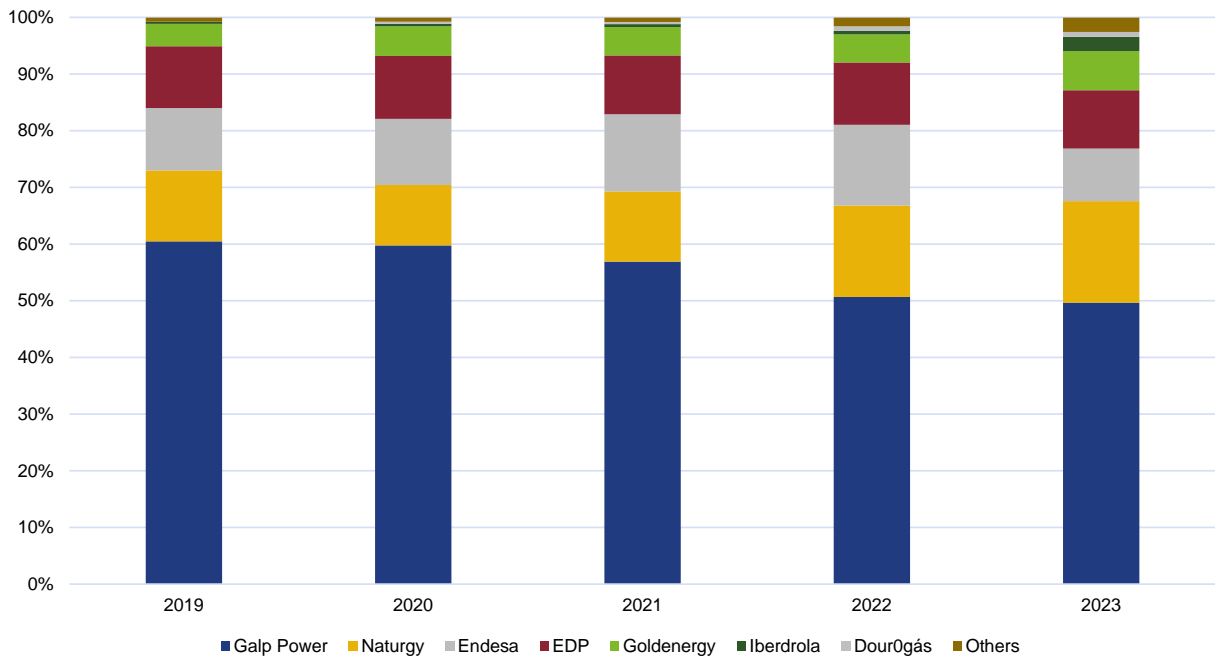
Figure 4-32 – Evolution of gas market concentration in number of customers and consumption, 2019 to 2023 (HHI)



Source: OLMC data

Galp, the main natural gas supplier, has suffered a decrease in its market share, from 60% in 2019 to 50% in 2023, as shown in Figure 4-33, while Naturgy increased its share to 18%, a growth of 5 p.p. compared to 2019.

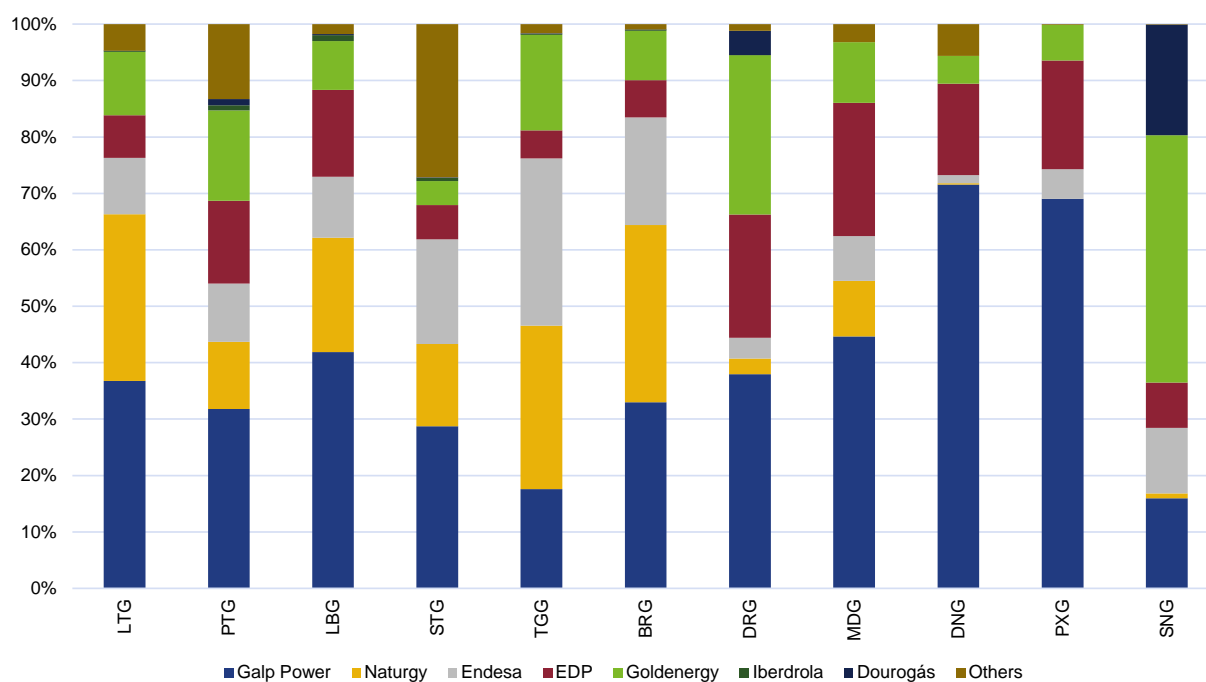
Figure 4-33 – Supply structure in the liberalised market by supplier, 2019 to 2023



Source: OLMC data

The breakdown of consumption market share by distribution network is shown in Figure 4-34. In 2023, Galp had a market share below 50% in most distribution areas, except for Dianagás (DNG) and Paxgás (PXG).

Figure 4-34 – Breakdown of consumption by suppliers on the liberalised market and by distribution network, 2023



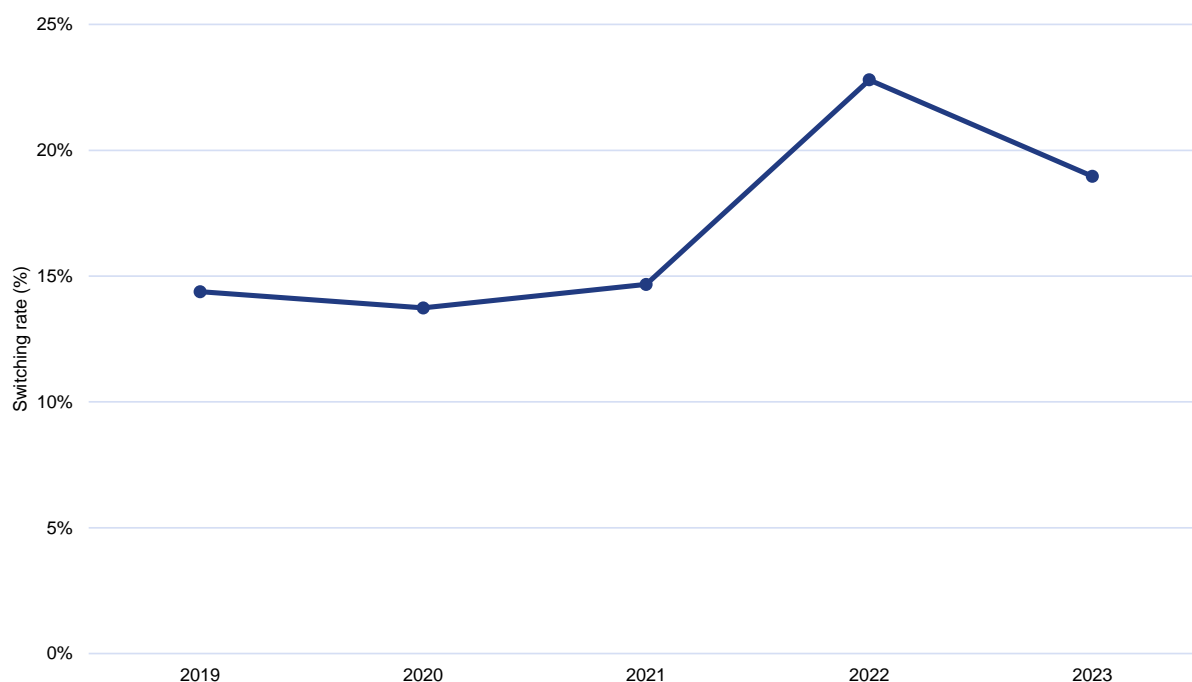
Source: OLMC data

In 2023, EDP Comercial, Naturgy and Endesa had significant consumption market shares, equal or higher than 10% in many distribution areas, namely the ones managed by REN Portgás (PTG), Lisboagás (LBG), Setgás (STG), Duriensegás (DRG), Medigás (MDG) and Paxgás (PXG).

Also, Goldenergy has considerable shares in Sonorgás (SNG) and Duriensegás (DRG), around 43.8% and 28.3%, respectively.

The switching rate in number of customers remains considerable, with around 19% of natural gas consumers switching their supplier, as shown in Figure 4-35.

Figure 4-35 – Gas supplier switching in number of clients, 2019 to 2023



Source: OLMC data

ERSE publishes the evolution of the retail market on its website¹⁸⁰ in the form of a monthly report, where the market competition level in the different market segments is analysed.

4.2.2.2 RECOMMENDATIONS ON SUPPLY PRICES, INVESTIGATIONS AND MEASURES TO PROMOTE EFFECTIVE COMPETITION

RECOMMENDATIONS FOR SUPPLY PRICES

In 2023, ERSE did not publish any recommendations regarding the compliance of supply prices on the liberalised market with Article 41 of Directive 2009/73/EC.

With regard to the regulated market, ERSE approved the gas tariffs and prices for the 2022-2023 gas year by Directive 15/2022 of 28 June. In January 2023, ERSE undertook its first update of the energy tariff for the gas supply activity, via by Directive no. 1/2023 of 9 January. This update was justified by the existence

¹⁸⁰ Available on ERSE's website at: [https://www.erse.pt/biblioteca/atos-e-documentos-da-erse/?tipologia=---+Mercado+Liberalizado+-+G%C3%A1s+Natural&setor=&ano=&descricao=.](https://www.erse.pt/biblioteca/atos-e-documentos-da-erse/?tipologia=---+Mercado+Liberalizado+-+G%C3%A1s+Natural&setor=&ano=&descricao=)

of forecast deviations in the unit cost of gas supplies by the wholesale supplier of last resort (CURg), resulting in the Energy Tariff being updated by +2 EUR/MWh for the 2022-2023 gas year, with effect from 1 January 2023.

Subsequently, ERSE approved the gas tariffs and prices for the 2023-2024 gas year and the parameters for the 2024-2027 regulatory period by Directive 13/2023 of 25 July.

In situations where the SOLR acts to ensure supplies of last resort, namely in places where there is no supply from gas suppliers under the market regime and in situations where the supplier has been prevented from exercising their activity, the supplementary tariffs apply, under the terms of Article 25 of the ERSE's gas Tariffs Code and Article 250 of the ERSE's gas Commercial Relations Code.

MEASURES TO PROMOTE EFFECTIVE COMPETITION

Following on from a process that began in 2022 with the publication of Decree Law 70/2022, of 14 October, which establishes extraordinary and temporary measures within the framework of security of gas supply, and which includes measures relating to the status of dominant operator in the gas market, ERSE adopted and published Directive 7/2023, of 28 February, which approves the rules for making the list of dominant operators operational. This was followed by the definition of the list of entities with the status of dominant operator, which were able to give their opinion at the hearing of interested parties.

The existence of a concept of dominant operator in the gas market is an instrumental condition for the adoption of other measures to preserve and promote competition in the gas sector, most notably the establishment of the condition of market creator on the platform of the Iberian gas market – MIBGAS, which is mandatory. In turn, this latter condition (market maker) is intended to promote the liquidity of the products traded in the Portuguese area of MIBGAS and, as such, the provision of more competitively levelled transaction conditions for these products.

On the other hand, during 2023, ERSE issued opinions, in the use of its advisory powers, on the design of the centralised purchase auctions for biomethane and renewable hydrogen, resulting from the adoption of such a mechanism by the Portuguese government through Government Order no. 15/2023, of 4 January, submitted to the European Commission for approval in the context of state aid rules. Most of the content of ERSE's opinions in this area was aimed at promoting level playing fields for participation in the auctions to be held, as well as the competitiveness of the allocation mechanism itself, including the planned redemption and subsequent resale of guarantees of origin for renewable gases.

REGULATORY DEVELOPMENTS

TRANSITIONAL REGIME FOR APPLICATION OF END-CUSTOMER TARIFFS BY THE RETAIL SUPPLIER OF LAST RESORT

Since 1 July 2012¹⁸¹, natural gas regulated tariffs for supply of natural gas to end-customers with annual consumption lower than or equal to 10 000 m³, approved by ERSE for mainland Portugal, have a transitional nature.

In the 2022-2023 gas year and the 2023-2024 gas year, the transitional tariffs apply only to supplies from the retail supplier of last resort (CURR) in LP<. The transitional tariffs applicable to supplies in HP, MP and LP> have been extinguished since July 2012, October 2020 and December 2022, respectively.

Transitional tariffs for sale to end-customers are determined by the sum of the network access and of infrastructure tariffs, the transitional energy tariff and the regulated supply tariff, all approved by ERSE¹⁸².

In September 2022, through Decree Law no. 57-B/2022, of 6 September, end-customers with annual consumption of 10,000 m³ or less were allowed to return to the regulated market, to the regime of regulated tariffs for final customer supply, in order to minimise the impact of higher final natural gas prices on the budgets of families and small businesses, resulting from the armed conflict in Ukraine,.

In response to the increase in natural gas prices, the government approved a financial support scheme to stabilise gas prices, through Decree Law no. 84-D/2022 of 9 December, as amended by Decree Law no. 23/2023 of 5 April and Decree Law no. 79-A/2023 of 4 September. This scheme is applicable for corporate entities with an annual consumption of more than 10,000 m³.

4.3 SECURITY OF SUPPLY

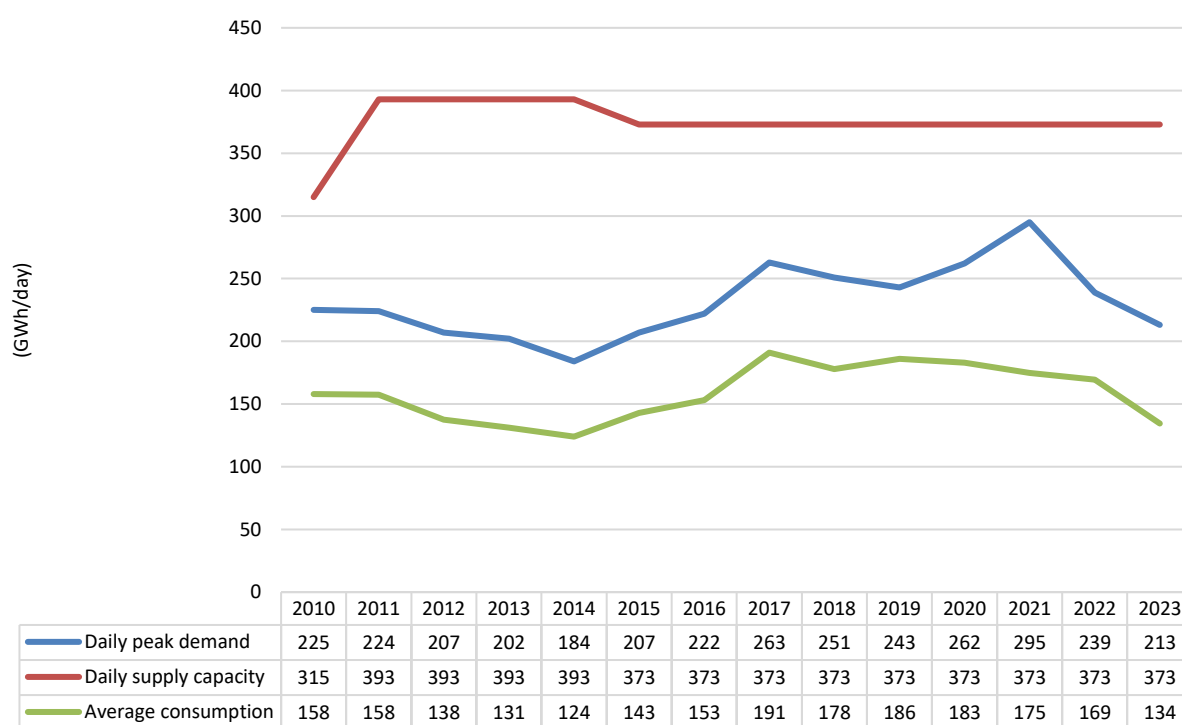
ERSE monitors gas capacity allocation in the RNTG, in particular the level of available capacity for commercial purposes compared to the capacity that has been utilised.

¹⁸¹ For consumers with an annual consumption higher than 500 m³. For consumers with an annual consumption equal to or lower than 500 m³, the transitional tariffs regime began on 1 January 2013 according to [Decree Law no. 74/2012, of 26 March](#).

¹⁸² [Directive 15/2022](#) of 28 June, as amended by [Directive 1/2023](#) of 9 January (gas year 2022-2023) and [Directive 13/2023](#) of 25 July (gas year 2023-2024), available at <https://www.erse.pt/atividade/regulacao/tarifas-e-precos-gas-natural/>.

Figure 4-36 presents the evolution of the available capacity in the SNG¹⁸³, daily average consumption and annual peak demand between 2010 and 2023. On average, the daily average consumption of natural gas declined 5.8 % per year between 2011 and 2014, increased 15.7 % per year between 2014 and 2017, having declined again nearly 2.3 % per year between 2017 and 2022. From 2022 to 2023 the annual consumption decreased by 21%. The highest annual peak demand in the SNG occurred in 2021 with a value of 295 GWh/day. The previous annual peak demand occurred in 2017, with a value of 263 GWh/day. In 2023, that peak value was 213 GWh/day.

Figure 4-36 – Evolution of supply capacity in the SNG, daily average consumption and peak demand, from 2010 to 2023



Source: REN Gasodutos

As shown in the previous figure, the daily available capacity increased by 25% between 2010 and 2011, as a result of an upgrade of the regasification system of the Sines LNG terminal and the sale by Enagás to REN Gasodutos of its share in RNTG. On the other hand, in 2014, a decrease of 5% in the daily capacity offer was observed as a result of the decrease in Enagás transport capacity on the Tuy-Valença do Minho

¹⁸³ The capacity offered in the SNG corresponds to the sum of the entry capacity at the interconnections of Campo Maior and Valença do Minho and the connection between the RNTG and the Sines LNG terminal.

interconnection. This decrease is still a constraint nowadays. Furthermore, the SNG's available capacity is remarkably higher than the daily peak demand along the entire period. In 2023, the average daily consumption and the peak demand corresponded respectively to 36% and 57% of SNG's available capacity.

The following table presents the yearly natural gas demand that occurred in the last five years, by client type.

Table 4-5 – Yearly natural gas demand, 2019 to 2023

Yearly natural gas demand per network type (TWh)	2019	2020	2021	2022	2023
Power Plants	23.82	24.72	22.33	28.11	16.31
High Pressure Network Customers	17.13	16.24	14.35	9.66	9.94
Distribution Network Customers (Concessioned, with GRMS (1))	25.13	24.00	25.01	22.12	20.82
Distribution Network Customers (Licensed with UAG (2))	1.87	1.94	2.17	1.93	2.00
Total	67.95	66.90	63.85	61.83	49.07

(1) GRMS - Gas Regulation and Metering Station

(2) UAG - Gas Autonomous Units

Source: REN Gasodutos

The table below presents a set of indicators that characterise the infrastructure and the network operators of the SNG between 2019 and 2023.

Table 4-6 – SNG’s infrastructure and network operator indicators, 2019 to 2023

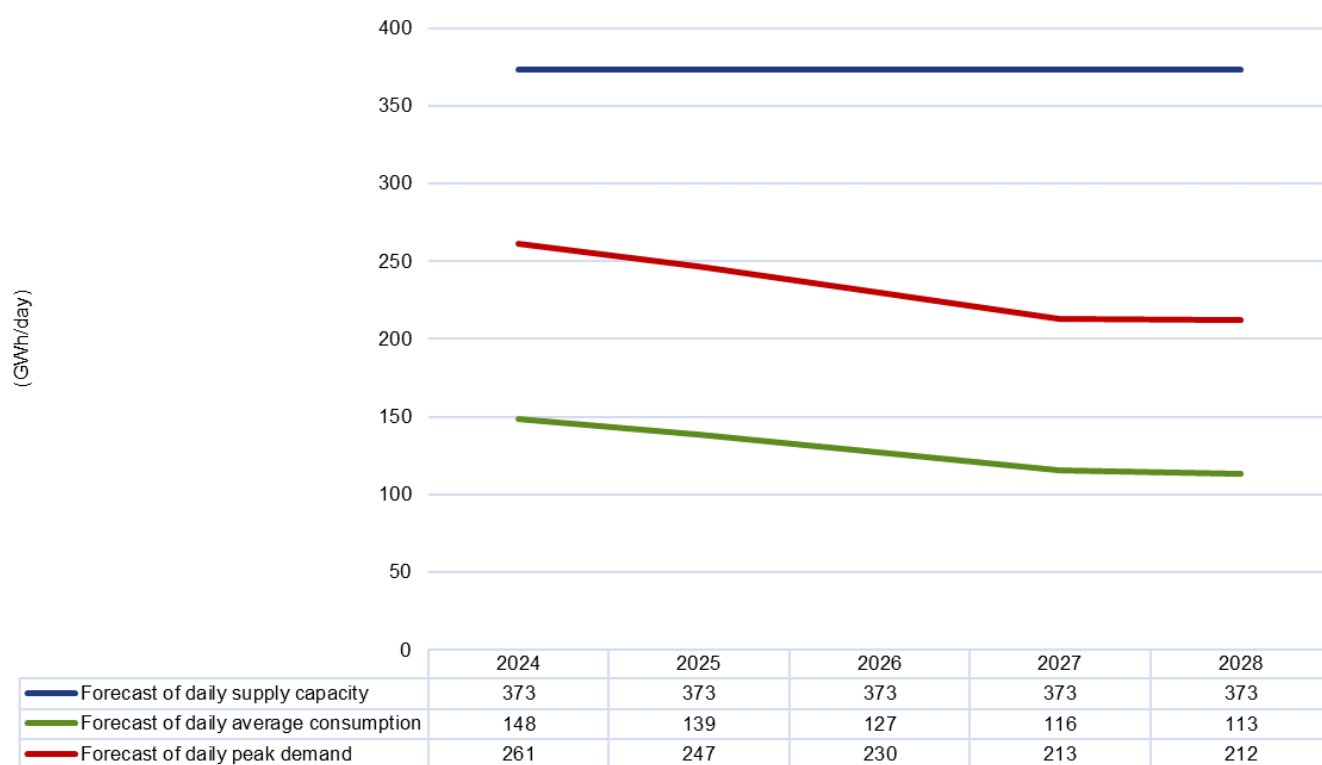
SNG Indicators	2019	2020	2021	2022	2023
Maximum gas daily consumption (GWh/day)	243	262	295	239	213
Pipeline entry capacity in TWh/y.	52.56	52.56	52.56	52.56	52.56
Pipeline exit capacity (exports) in TWh/y	29.20	29.20	29.20	29.20	29.20
LNG import capacity (maximum technical availability) in TWh/y	117	117	117	117	117
Maximum peak outflow rate of all LNG terminals in the country (GWh/day)	321	321	321	321	321
LNG Gas Storage Capacity	2569	2569	2569	2569	2569
Underground gas storage-working gas volume in Mm3(n)	322.6	322.6	322.6	322.6	322.6
Underground gas storage- Maximum withdrawal capacity (GWh/day)	129	129	129	129	129
Number of TSOs	1	1	1	1	1
Extension of TSOs grid (km)	1375	1375	1375	1375	1375
Number of DSOs	11	11	11	11	11
Extension of DSOs grids (km)	19395	19675	20037	20747	20963

Source: REN Gasodutos and ERSE

4.3.1 FORECAST OF DEMAND AND SUPPLY

Figure 4-37 shows forecasts of daily available capacity in the SNG, daily average consumption and peak demand, for the outlook period 2024-2028, based on data provided by REN Gasodutos.

Figure 4-37 – Forecast of daily supply capacity in the SNG, daily average consumption and peak demand, from 2024 to 2028



Source: REN Gasodutos – PDIRG 2024-2033

The expected available capacity for commercial purposes is considerably higher than the expected capacity that will be used in the coming years. In 2028, the average consumption and the peak demand are expected to represent about 30% and 57% of the available capacity in the SNG, respectively. According to REN Gasodutos' forecasts, the projects proposed under the Development and Investment Plan of the National Transmission Network, Storage Infrastructure and LNG Terminal Network (RNTIAT) for the period 2024-2033 do not have any impact on available capacity.

4.3.2 MEASURES TO SAFEGUARD SECURITY OF GAS SUPPLY

The promotion of conditions to ensure the SNG's security of supply is based on both supply and demand side measures.

Although the SNG depended mainly on a major gas supplier country, Algeria, for a number of years, the diversification of supply sources was enhanced by the Sines LNG terminal, which entered into operation in 2004. Since 2018, the country that most contributed to the supply of SNG natural gas was Nigeria.

Another initiative to promote security of gas supply, in terms of diversification of sources of supply, was the integration of the Portuguese market into an Iberian market, starting in 2017. Since 2018, there are market agents in the SNG, with significant activity in Spain, although since then there has been a decrease in the use of the interconnections and an increase in the LNG terminal, benefitting from the diversification of the existing supply sources in Spain.

Another way to ensure security of gas supply is to create and maintain emergency stocks able to ensure the supply of gas to protected customers, according to Regulation (EU) 2017/1938, of 25 October, regarding measures to guarantee the security of gas supply and the non-interruptible electricity producers, for a period of 30 days in a situation of lack of supply to the SNG.

Based on the findings of the Report on “Security of Supply Risk Assessment for Portugal, referring to the period 2023-2040”¹⁸⁴, the RNTIAT has sufficient storage capacity to cover all the emergency stock needs.

In addition to the measures adopted on the supply side to safeguard the security of gas supply and to meet peak demand, there are also measures implemented on the demand side, involving the use of alternative fuels, in particular crude oil and/or petroleum products replacing natural gas in interruptible electricity producers. Indeed, Tapada do Outeiro and Lares are bi-fuel power plants and are contractually authorised to guarantee their functioning by using alternative fuels other than natural gas, according to Article 99 of Decree Law No. 62/2020, of 28 August.

¹⁸⁴ Published by DGEG and approved by the Deputy Secretary of State and Energy.

5 CONSUMER PROTECTION AND DISPUTE SETTLEMENT

5.1 CONSUMER PROTECTION

The protection of the rights and interests of energy consumers is one of ERSE's general responsibilities, which is reflected in all of its activities and underpins its regulatory decisions, namely in the establishment of rules for the commercial relationship with energy customers, in the setting of tariffs, in the establishment of rules regarding the quality of the services provided and in providing information and support to consumers.

Consumer protection activities cover several themes: (i) measures of a regulatory nature; (ii) verification of compliance with applicable legislation and regulation; (iii) provision of information and training to consumers and their representatives; (iv) promotion of the resolution of conflicts arising from the commercial relationship; (v) compensation to consumers through the application of the sanctioning regime.

Regarding verification, it is worth highlighting ERSE's registration and monitoring of the general contractual conditions proposed by suppliers in the liberalised market, as well as the respective updates, recommending the needed changes to comply with legal and regulatory provisions applicable to energy supply.

Regarding consumer information, in addition to responding to requests submitted individually, educational and informative content is periodically prepared and disclosed through the ERSE website, in the area specifically dedicated to energy consumers. Educational videos, explanatory leaflets (in digital and physical format), "Anotes" (useful advice) and "Dicas" (tips for saving energy) are made available, and in 2023 the ERSExplica (ERSE explains) informative series was continued, aiming to make regulatory issues more accessible to consumers and other interested parties. The dissemination of all these materials is reinforced by sending them to consumer protection bodies (consumer associations, Direção Geral do Consumidor - General Directorate for Consumers, municipal services), to consumer dispute arbitration centres, as well as to other entities that, due to their public interest mission of national or more local scope, aim to protect consumers.

Thus, throughout the year, various ERSExplica were published on issues identified by ERSE as fundamental for energy consumers:

- Transitional gas price stabilisation regime for legal persons with consumption of more than 10 000 m³ (January);
- Supervision parameters for the National Petroleum System (June);
- Exceptional setting of electricity tariffs from 1 July 2023 (June);
- Regulatory review of the electricity sector (July);
- How to complain (July);
- When and how to report your electricity meter reading (August);
- When and how to report gas meter readings (August);
- Gas Technical Quality of Service Report - 2022 (September);
- Electricity Technical Quality of Service Report - 2022 (October);
- Commercial Quality of Service - 2022 (October);
- Electricity and Gas Retail Markets Report - 2022 (November).

As in previous years, in 2023 ERSE developed several information leaflets with the aim of informing consumers about issues that were on the daily agenda:

- ERSE/GNR leaflet: ERSE alerts on electricity and gas for the elderly (July);
- ERSE/GNR leaflet: ERSE alerts on electricity and gas for local businesses (September);
- Social Tariff leaflet (October).

In 2023, new "Dicas" and "Anotes" were published, containing practical savings advice and essential information, in a few words and in a very direct way, on fundamental aspects for more informed and knowledgeable consumer behaviour, confirming or dispelling convictions and quantifying possible expenses and savings.

During the year, they were produced in digital and paper format:

- Fuel "Dicas" and "Anotes" (February);
- LPG "Dicas" and "Anotes" (February);
- Electricity and Gas "Dicas" and "Anotes" (March).

During 2023, the production of five educational videos on the Technical Quality of Service Reports for the gas and electricity sectors and on the 2022 Energy Consumer Support Bulletin continued, and these were published on ERSE's LinkedIn. The Institutional video (Portuguese and English version) was also updated, as was the video: "Electric Mobility - How to charge an electric vehicle at public access points?", available on ERSE's YouTube channel ¹⁸⁵.

ERSE's virtual assistant - Gia - is still available on the ERSE portal, and in 2023 it received around 7 236 messages from 2 888 users on 17 different topics.

From October 2023, ERSE also promoted an information campaign from Monday to Friday as part of the "Converse com a ERSE" ("Talk to ERSE") radio programme, in partnership with Rádio Antena 1, aimed at answering the most common questions from energy consumers. The six-month campaign is based on questions raised by Antena 1 listeners and, in the 49 episodes broadcast until the end of December, covered topics such as "Social Tariff", "Self-consumption", "How to Complain", "Prices and Simulators", "Switching Suppliers and Loyalty", "Electric Mobility", "Contractual Changes", "Smart Meters", "Estimated Billing", etc.

During the months of October, November and December, this information campaign allowed the various messages to potentially reach around 45 million listeners¹⁸⁶.

"Converse com a ERSE" was also adapted to video format¹⁸⁷ so that it was available on ERSE's YouTube channel, and was also accessible via RTP Play, Spotify and iTunes.

Every quarter, ERSE publishes the Bulletin prepared by our ACE team – Apoio ao Consumidor de Energia (Energy Consumer Support Office), which discloses the number of requests for information, complaints and interventions dealt with by ERSE in each quarter (comparing the situation with the three previous quarters), the issues, the companies complained about and the main results obtained with ERSE's intervention. In addition, there is usually an explanation of a theme, action or event that has involved ERSE, always in the sphere of energy consumer protection.

Under the ERSEFORMA programme, eight clarification and training actions were held in 2023 for its main target audience, which are consumer protection and alternative consumer dispute resolution entities, such

¹⁸⁵ Available at [link](#)

¹⁸⁶ According to a check carried out by the clipping company CARMA

¹⁸⁷ Available at ERSE's site in "Comunicação/Multimédia/Podcasts" ([link](#)).

as consumer conflict arbitration centres, consumer associations and municipal consumer information and support services. Other public and private entities with an interest in the energy sector also participated in these actions. The themes of these training sessions were the following:

- Training and awareness-raising session on electricity tariffs and prices (23 February);
- Electricity and natural gas billing (1 June);
- Switching electricity and natural gas suppliers (11 July);
- Quality of service in electricity and natural gas (technical and commercial aspects) (19 October);
- Electric mobility (21 November);
- Misappropriation of energy (28 November).

Under the protocols established by ERSE with third parties, the following training sessions were held:

- Determining factors in the cost of electricity - prices and tariffs (8 November) - CAP;
- Simplifying the world of energy (13 November) - Casa Pia.

The information and training contents used in the actions described were made available on ERSE's website¹⁸⁸.

As part of consumer education and training, a training session for journalists was also held on 30 October, with the aim of informing journalists about the training work carried out by ACE Team, providing them with the knowledge they need to inform consumers of its importance and usefulness. This training session was attended by some of the main Portuguese media.

In an effort to reach younger audiences, ERSE has developed a project with primary schools. This type of action aims to raise awareness of ERSE, make younger generations aware of the impacts of energy consumption and alert them to the importance of saving energy by adopting energy efficiency practices, explaining how the electricity and natural gas sectors work, from their origin to consumption in our homes.

To this end, in May 2023, two sessions were held to raise awareness of the energy sector among the school population in the Lisbon Metropolitan Area, covering students in the 2nd and 3rd cycles of basic education.

¹⁸⁸ Available at <https://www.erse.pt/erseforma/erseforma/>.

In October, under the Cooperation Protocol signed with the Guarda Nacional Republicana (GNR) (National Republican Guard), ERSE took part in an action to raise awareness among the elderly population, as part of the "Census Senior" operation, which targeted around 45 000 elderly people.

Every year, ERSE participates in this proximity policing operation by taking part in information sessions, but also by distributing a leaflet containing various warnings about electricity and natural gas, as well as advice from the GNR on safety behaviours to be adopted by the senior population. The main questions focused on electricity contracts and the deadlines for withdrawing from the contract in case of regret, meter reading and the social tariff.

In December, ERSE also accompanied the GNR in carrying out an action in the field, as part of the "Comércio Seguro 2023" (Safe trade 2023) operation. Around 15 local shopkeepers and their customers were contacted, clarifying doubts about contracting energy supply, consumer rights, energy efficiency measures and prevention of possible infractions or scams in this area. Leaflets were also distributed with warnings about electricity and natural gas for this customer segment and safety tips.

Furthermore, since 2004, ERSE has provided a telephone support line for consumers (personalised and operated directly by ERSE employees) which was available on working days from 3pm to 6pm. However, in 2022, motivated by the significant and rapid changes in the energy sector, the number of telephone contacts to ERSE increased substantially. Thus, in order to ensure that the increasing number of requests were answered by telephone and with quality, ERSE contracted an external front-line telephone support service, maintaining the handling of more complex issues by ERSE employees (second-line, by return call) and allowing for an increase in the opening hours (working days, from 9am to 7pm). This new solution has been in operation since the end of October 2022.

In 2023, 11 206 calls were answered and 1 230 calls were returned.

When it comes to resolving conflicts arising from commercial and contractual relations between energy suppliers and consumers, in addition to clarifying the situation for the parties involved, ERSE can recommend or suggest the resolution of a dispute, although it cannot impose a solution in the specific case. At the same time, ERSE encourages the use of arbitration, in particular that provided in the existing consumer conflict arbitration centres. ERSE provides technical and financial support to the seven Centros de Arbitragem de Conflitos de Consumo (CACC) (Arbitration centers for consumer disputes) whose operations cover the territory of mainland Portugal, with whom it signed cooperation protocols in 2019.

As part of monitoring the application of the protocols signed, in 2023 ERSE participated in 12 general meetings, four technical-financial councils and two councils of representatives of the arbitration centres.

Various other contacts were also established with these entities, as well as with the other regulators of essential public services and with the Direção Geral do Consumidor (Directorate-General for Consumers) and the Direção Geral da Política da Justiça (Directorate-General for Justice Policy) in the context of monitoring the protocols signed with the CACCs. Technical support was also provided, when requested, to some of these arbitration centers on issues raised in the assessment of disputes submitted to the Arbitration Court of these centers. Most of the training activities carried out by ERSE, as mentioned above, were dedicated to these entities, with a total of six training activities aimed at CACCs.

As mentioned, ERSE provides financial support to these entities, as provided for in the law and in said protocols. The calculation of the values to be attributed to each of the arbitration centres presupposes an assessment of the fulfilment of the performance indicators defined in the protocols. For this purpose, ERSE is sent statistical information on the procedural progress in the arbitration centres, as well as a copy of the arbitration decisions on the energy sector, which are registered and analysed.

Quality of service in Portugal is divided into technical quality of service and commercial quality of service. Commercial service quality deals with communication with customers, services provided at customers' premises and complaints and requests for information. It also defines customers with special needs and priority customers, and specifies companies' procedures towards them. In commercial quality of service, the time limits and standards are the same for both sectors (electricity and gas), with some exceptions related to the characteristics of the services provided. In 2023, ERSE published a new Code on Quality of Services (RQS), following a public consultation.

In 2023, ERSE inspected and monitored compliance with the quality of service obligations at a commercial level through:

- Customer mystery shopping of the services of various suppliers, in which opportunities for improvement in company performance were identified. The regulatory review carried out in 2023 also benefited from clarifications and adjustments to the regulations resulting from these customer mystery actions.
- Two inspections of two suppliers' call centers in the city of Porto.
- Periodic meetings with companies to monitor their quarterly performance and clarify issues.

ERSE also published in 2023 the annual report on the quality of commercial service in the electricity and gas sectors.

The following chapter provides more detailed information on the handling of complaints, requests for ERSE intervention and requests for information carried out in 2023.

5.2 DISPUTE SETTLEMENT

The handling of complaints/conflict resolution is one of the areas of intervention of the ACE, which is integrated in ERSE's Directorate of Energy Consumers. The two other areas are consumer information and consumer training/education, referred to in the previous section.

The contractual and commercial relationship between consumers and their energy service providers generates doubts, complaints or even conflicts. It is up to suppliers, network operators and other service providers to deal with them, namely by responding directly to their customers.

ERSE has a second-line intervention role, i.e. when consumer requests are not clarified or resolved by the service provider.

The following kinds of cases are received and forwarded to ERSE on a daily basis:

- complaints from consumers who use the service providers' complaint books (physical and electronic formats). These are complaints addressed to the companies which ERSE receives in copy, in line with the legal regime for the complaints book;
- requests for intervention by ERSE for complaints where the consumer was not satisfied with the response received or did not get an answer;
- requests for information addressed to ERSE.

In 2023, ERSE received 20 666 new complaints addressed directly to companies via their complaints books, 3 511 requests for ERSE to intervene in complaints and 3 897 requests for information addressed to ERSE. The total number of cases (28 074) represents a decrease of around 15% on the 2022 total.

The complaints received by ERSE are a subset of the total complaints received by service providers, given that ERSE only receives those which are presented through the companies' complaints book (physical and electronic). As a rule, there is no analysis of each specific case presented in the complaints book, the priority being given to the company resolving the issue with its customer. All complaints are registered and subject

to statistical treatment (number, typification, response times, etc.). The electricity sector, with around 5.55 million customers, was the sector with the highest number of complaints received by ERSE, totalling 15 489. Customers with natural gas contracts, around 722 000, were the source of 2 009 complaints received by ERSE. Customers with dual supply (electricity and natural gas), around 840 000, gave rise to 2 921 complaints received by ERSE. The piped liquefied petroleum gas (LPG) subsector received a total of 220 complaints and electric mobility 26 complaints. Billing issues, in its various subcategories (lack of or difficult access to billing, double billing, unclear or incorrect billing and billing adjustments), continued to occupy first place, with 6 137 complaints, followed by the supply contract, with 1 777 complaints.

Following the response from the company providing the service or in its absence, at the end of the deadline, the customer may request ERSE's intervention, namely by filling in an appeal form¹⁸⁹ which is available on ERSE's website.

In 2023, 3 511 requests for ERSE intervention were received. These are distributed, in descending order, by the electricity sector, natural gas, dual supply, piped LPG, electric mobility and bottled gas sectors. Billing, followed by prior notice of interruption of supply and issues related to meter reading are the predominant topics in this kind of process.

In the majority of situations in which ERSE's intervention is requested, it is necessary to contact the entity complained against in order to obtain its position and, in several situations, more detailed elements on the specific case. The result of ERSE's intervention can be systematised into the following situations:

- information is provided to the consumer by ERSE,
- the entity complained about or the complainant changes its position,
- the entity which has received the complaint or the complainant does not change its position on the specific case. Under the terms of its competences, ERSE cannot impose a solution in a concrete conflict, although if it identifies any legal or regulatory non-compliance it will signal it for possible sanctioning action. Nevertheless, the complainant is given information on the possibility of resorting to other instances, especially promoting contact with the means for alternative dispute resolution, starting with those developed in the arbitration centres,
- other results (e.g. cases that were cancelled, filed or other situations).

¹⁸⁹ Available at Erse's site in "Consumidores de Energia" (Energy Consumers) ([link](#)).

As for the results obtained in the cases concluded during the year, it should be highlighted that in 60% of the situations, the process is concluded with information to the consumer or with total or partial resolution of the conflict.

During 2023, ERSE received 3 897 requests for information, with electricity and natural gas being the main sectors in this type of process. The topics most asked about in the electricity sector were self-consumption, the supply contract and billing. In the natural gas sector, it was billing, tariffs and prices and the supply contract.

6 COMPLIANCE

6.1 CERTIFICATION OF TRANSMISSION NETWORK OPERATORS

REN - Rede Eléctrica Nacional, S.A., as the operator of the National Electricity Transmission Network and REN Gasodutos S.A, as the operator of the National Natural Gas Transmission Network, were certified by ERSE in 2015 as TSOs under the full ownership unbundling regime, after verification of their full compliance with the conditions required for the attribution of the certification.

The procedure for certification of the TSO for electricity and the TSO for natural gas aims at assessing compliance with conditions relating to the legal and ownership unbundling of these operators.

Since 2015, ERSE has been continuously monitoring and supervising compliance with the conditions of the certification awarded to the said transmission system operators.

To this end, the electricity TSO, as well as the natural gas TSO, must send ERSE, by 30 June of each year, a report, with respect to 31 May of that year, containing complete and detailed information on the status of compliance with the conditions relating to independence, in legal and patrimonial terms, of these network operators provided for in the legal certification scheme, as well as all the minutes of the general meetings of the economic group to which it belongs.

The electricity TSO, as well as the natural gas TSO, must also send ERSE their communications regarding qualified holdings, as well as annual and half-yearly information that REN - Redes Energéticas Nacionais, SGPS, S.A. discloses to the market or to the Portuguese Securities and Markets Commission (CMVM).

These obligations were fulfilled by the RNT (electricity) operator and by the RNTGN (natural gas) operator and there were no elements known to ERSE, during 2023, that called into question the fulfilment of the conditions set out in the certification decision of REN - Rede Eléctrica Nacional, S.A. and REN Gasodutos, S.A.

Storage system operators must also be certified in accordance with Article 3 of Regulation (CE) 715/2009, as amended by Regulation (EU) 2022/1032 (hereinafter "Regulation (CE) 715/2009").

In Portugal, REN Armazenagem, S.A. is the storage system operator. In order to undertake the certification in question, ERSE assessed information on the underground storage facilities, the legal impediments of the members of the Board of Directors and the lack of contractual rights or obligations of REN Armazenagem

vis-à-vis third countries. In view of the information gathered, security of supply is not considered to be at stake and, as a result, the Operator should be certified. Naturally, ERSE continuously monitors the Storage Network Operator in order to check that it fulfils the requirements for certification.

To this end, ERSE sent a draft decision to the European Commission on 13 November 2023, awaiting its opinion, in accordance with Article 3a (6) of Regulation 715/2009 (CE).

6.2 LEGISLATIVE DEVELOPMENTS

Within the scope of the regulatory power entrusted to ERSE, the following regulations were published in 2023:

- Regulation no. 814/2023, of 27 July - Approves the Code on the Misappropriation of Energy;
- Regulation no. 815/2023, of 27 July - Approves the Electricity Sector Self-Consumption Code and repeals Regulation no. 373/2021, of 5 May;
- Regulation no. 816/2023, of 27 July - Approves the Electricity Sector Network Operation Code and repeals Regulation no. 557/2014, of 19 December, and Regulation no. 621/2017, of 18 December;
- Regulation no. 817/2023, of 27 July - Approves the Code on Electricity Smart Grid Services for Electricity Distribution and repeals Regulation no. 610/2019, of 2 August;
- Regulation no. 818/2023, of 27 July - Approves the Code on Access to Electricity Sector Networks and Interconnections and repeals Regulation no. 560/2014, of 22 December, and Regulation no. 620/2017, of 18 December;
- Regulation no. 825/2023, of 28 July - Approves the Gas Tariff Code and repeals Regulation no. 368/2021, of 28 April, and Regulation no. 538/2022, of 28 June;
- Regulation no. 826/2023, of 28 July - Approves the Quality of Service Code for the Electricity and Gas Sectors and repeals Regulation no. 406/2021, of 12 May;
- Regulation no. 827/2023, of 28 July - Approves the Commercial Relations Code for the Electricity and Gas Sectors and repeals Regulation no. 1129/2020, of 30 December;

- Regulation no. 828/2023, of 28 July - Approves the Electricity Tariff Code and repeals Regulation no. 785/2021, of 23 August.

Also of a regulatory nature, the following normative acts approved by ERSE in 2023 stand out:

- Directive no. 1/2023, of 9 January - Approves the first update of the energy tariff for the gas sector to enter into force on 1 January 2023;
- Directive no. 2/2023, of 9 January - Approves the tariffs of the Electric Mobility Network Management Entity for 2023;
- Directive no. 3/2023, of 11 January - Approves tariffs and prices for electricity and other services in 2023;
- Directive (extract) no. 4/2023, of 16 January - Approves the electricity consumption, production and self-consumption profiles applicable in 2023;
- Directive no. 5/2023, of 16 January - Approves incentives for the optimised management of CO emission allowances (index 2) in the Autonomous Region of the Azores and the Autonomous Region of Madeira;
- Directive (extract) no. 6/2023, of 16 January - Approves the loss profiles applicable in 2023;
- Directive no. 7/2023, of 28 February - Approves the rules on the operationalisation of the constitution of the list of dominant operators;
- Directive no. 8/2023, of 22 March - Approves the implementation of the exceptional mechanism for adjusting electricity production costs;
- Directive no. 9/2023, of 2 April - Approves the first update of the energy tariff for the electricity sector to enter into force on 1 April 2023;
- Directive no. 10/2023, of 11 April - Approves the reporting obligations under the cost adjustment mechanism in the Iberian Electricity Market (MIBEL);
- Directive no. 11/2023, of 18 July - Approves the parameters relating to the methodology for supervising the National Petroleum System;

- Directive no. 12/2023, of 21 July - Extends the effective date of the amendment to the Global System Management Procedures Manual, by Directive no. 23/2022, of 13 December;
- Directive no. 13/2023, of 25 July - Approves the gas tariffs and prices for the 2023-2024 gas year and parameters for the 2024-2027 regulatory period;
- Directive no. 14/2023, of 26 July - Tariffs and prices for electricity from July to December 2023 - exceptional setting;
- Directive no. 15/2023, of 27 July - Gas consumption profiles and average daily consumption approved by the Energy Services Regulatory Authority for the period between July 2023 and June 2024;
- Directive no. 16/2023, of 30 August - Approves the rules for trading products with delivery at the Virtual Trading Point (VTP) on the MIBGAS platform;
- Directive no. 17/2023, of 31 August - Approves the procedures manual for the Guarantees of Origin Issuing Entity;
- Directive no. 18/2023, of 22 December - Implements the Frequency Restoration Reserve Band Market with manual activation;
- Directive no. 19/2023, of 26 December - Approves the Manual of Procedures for Global System Management in the electricity sector;
- Directive no. 20/2023, of 26 December - Approves the special rules for participation of demand in system services;
- Instruction no. 1/2023 - Complementary Financial and Operational Reporting Standards for the Electric Mobility Network Operations Management activity;
- Instruction no. 2/2023 - Instruction on the application of Decree Law no. 84-D/2022, in its current wording, to cogenerators under the market regime;
- Instruction no. 3/2023 - Instruction on the revision of parameters for the 2022 to 2025 regulatory period for the electricity sector;

- Instruction no. 4/2023 - Instruction on the certification by external auditors of the complementary information to the tariff procedure;
- Recommendation no. 1/2023 - Communication of changes to contractual conditions at the initiative of electricity and natural gas suppliers.

6.3 SANCTIONS REGIME

Within the scope of the energy sector sanctioning regime, approved by Law n.º. 9/2013, of 28 January, during 2023, 46 new complaints were received¹⁹⁰, in addition to the detection by ERSE of illicit acts and the reports received from criminal police bodies and other public entities.

In 2023, ERSE completed the processing of all the complaints received by 31 December 2022 and, of the complaints received in 2023, 34 complaints were processed¹⁹¹. Of the complaints received and processed in 2023, six were closed and four became part of administrative offence proceedings. In addition, as these were matters that did not fall within ERSE's remit, one complaint was referred to the Food and Economic Safety Authority (ASAE); three complaints were referred to the Directorate-General for Energy and Geology (DGEG) and two complaints were referred to the National Entity for the Energy Sector (ENSE). In addition, because they did not concern administrative offences, but were related to contractual issues in which the complainant wanted the dispute resolved, six of the complaints received by ERSE in 2023 were referred to the Energy Consumer Support Service (ACE). The remaining complaints are awaiting additional information. The remaining complaints are awaiting additional information.

In 2023, as in previous years, the main issues reported were: the communication of readings and invoices; unfair commercial practices (in particular, contracting supply through aggressive practices); the unjustified interruption of the supply of electricity and natural gas; issues related to switching suppliers and the complaints book.

¹⁹⁰ Excludes complaints which are repeated, tests or equivalent

¹⁹¹ Includes complaints which were treated, but which await addition information in order to proceed; complaints sent to external entities; complaints sent to ACE; complaints which are part of administrative offence proceedings and filed complaints.

During 2023, ERSE opened 36 new administrative offence proceedings, as a result of the complaints and reports received, which resulted in a total of 141¹⁹² administrative offence proceedings being processed, including proceedings carried forward from previous years and proceedings opened.

During 2023, ERSE deduced 43 notes of illegality and decided 76 administrative offence proceedings, which resulted in 45 convictions with the application of fines, of which 16 in settlement proceedings and seven voluntary payments; 26 closures; five admonishments. Of the cases closed, three received warnings.

Of the proceedings decided by ERSE in 2023, the following convictions are highlighted:

a) Petrogal - Petróleos de Portugal, S.A. was fined €167 600,00 halved to €83 800,00, per transaction. Petrogal was condemned for having interrupted the supply of electricity and natural gas outside the cases provided for by law, for submitting requests to change supplier without the customer's express authorisation to do so, for billing beyond 6 weeks and for unduly terminating the contract;

b) E-Redes Distribuição de Eletricidade, S.A. was fined €121 000,00 halved to €60 500,00 per transaction. E-Redes was found guilty of interrupting the electricity supply outside the cases provided for by law, failing to pay compensation on time and failing to provide information to customers via the internet;

c) Iberdrola Clientes Portugal, Unipessoal, Lda. was fined €279 000,00 halved to €139 500,00 per transaction. Iberdrola was condemned for submitting requests to change supplier without the customer's express authorisation to do so, for failing to submit requests to change supplier to the OLMC within a maximum of five working days, for failing to assess the legitimacy of entering into a supply contract, for failing to carry out full recording/call preservation, for unduly terminating a contract and for failing to provide information to customers via the internet;

d) The FLOENE Group:

i) Lisboagás GDL - Sociedade Distribuição Gás Natural de Lisboa, S.A. was fined €54 000,00 halved to €27 000,00 per transaction. Lisboagás was condemned for carrying out annual checks on the adequacy of the consumption levels of installations, for the purposes of billing the natural gas supply service, in disregard of the 12-month periodicity from the date of the last annual checks;

¹⁹² On 01/01/2023, there were 105 ongoing processes at ERSE that were carried over from previous years.

ii) Network operators and last resort natural gas suppliers (Beiragás - Companhia de Gás das Beiras, S.A.; Dianagás - Sociedade Distribuidora de Gás Natural de Évora, S.A.; Duriensegás - Sociedade Distribuidora de Gás Natural do Douro, S.A.; Lisboagás Comercialização S.A.; Lusitaniagás Comercialização S.A.; Lusitaniagás Comercialização S.A.). Lusitaniagás Comercialização S.A.; Paxgás - Sociedade Distribuidora de Gás Natural de Beja, S.A.; Setgás Comercialização S.A.; Tagusgás - Empresa de Gás do Vale do Tejo, S.A.; Lisboagás GDL - Sociedade Distribuição Gás Natural de Lisboa, S.A.; Lusitaniagás - Companhia de Gás do Centro, S.A., Setgás - Sociedade de Distribuição de Gás Natural, S.A.) and Medigás - Sociedade Distribuidora de Gás Natural do Algarve, S.A., were fined a total of €54 000,00 by unilateral ERSE decisions. The FLOENE Group companies were fined for not providing information to customers via the internet and, in the case of Lisboagás GDL, for not sending reports to ERSE on time.

Under the Legal Framework of the Portuguese complaints book, fines were imposed on companies with petrol stations which led to the payment of fines totalling €14 830,00. In addition, a fine of €750,00 was received as part of a contested administrative offence against Palpetro - Combustíveis e Lubrificantes, Lda.

With reference to the decisions taken during 2023, the total value of the fines imposed under the respective administrative offence proceedings totalled €765 750,90, with the amount of fines actually collected corresponding to € 416 915,20, essentially as a result of the reductions made under the legal Transaction regime.

The total received includes €14 215,00 transferred to ERSE by the National Entity for the Energy Sector (ENSE), under the terms of article 21 of Law no. 5/2019, of 11 January, since the proceeds of the fines revert to ERSE.

On the other hand, in 2023, compensation was paid to consumers in the following cases as part of administrative offence proceedings:

- Case against Petrogal - Compensation was awarded to injured customers totalling €1 400, 00, €75, 00 in the case of supply interruptions and €20, 00 in other cases. In total, 26 consumers were compensated in the settlement procedure.

- Case against E-Redes - Individual compensation of €50, 00 was awarded to 6 aggrieved customers, who had not yet been compensated before the final decision, totalling €300, 00 in the settlement procedure.

- Case against Iberdrola - Compensation of between €20, 00 and €100, 00 was awarded to 41 injured customers, totalling €1 600, 00.

Consumers were thus awarded compensation totalling €3,300.00 in the settlement procedure.

The maximum value of compensation awarded to a consumer was €100, 00 and the minimum value of compensation awarded to a consumer was €20, 00 for failing to submit a request to change supplier to the OLMC within a maximum of 5 working days.

6.4 ELECTRIC MOBILITY

The legal and regulatory framework for electric mobility foresees the following agents:

- Managing entity of the electric mobility network (EGME) - an entity that, under a monopoly regime, is responsible for managing the information that allows any user to charge their vehicle at any charging point using their contract with their electricity supplier for electric mobility (CEME). This activity is developed by MOBI.E, S.A.;
- Electricity suppliers for electric mobility (CEME) - entities that provide the charging service to their customers (the users), with whom they conclude a contract at market price;
- Charging point operators (OPC) - entities responsible for charging points, charging a price established on a market basis. Users pay through their CEME, the only entity with whom they have a contract;
- Electric vehicle user (UVE) - entity that establishes a contract with a CEME to charge their electric vehicle.

The network operated by MOBI.E, S.A. has been undergoing expansion observing the growth of 30% of the charging points compared to the year of 2022, totalling 8,499 of which 36% are fast chargers (above 22 kW)¹⁹³.

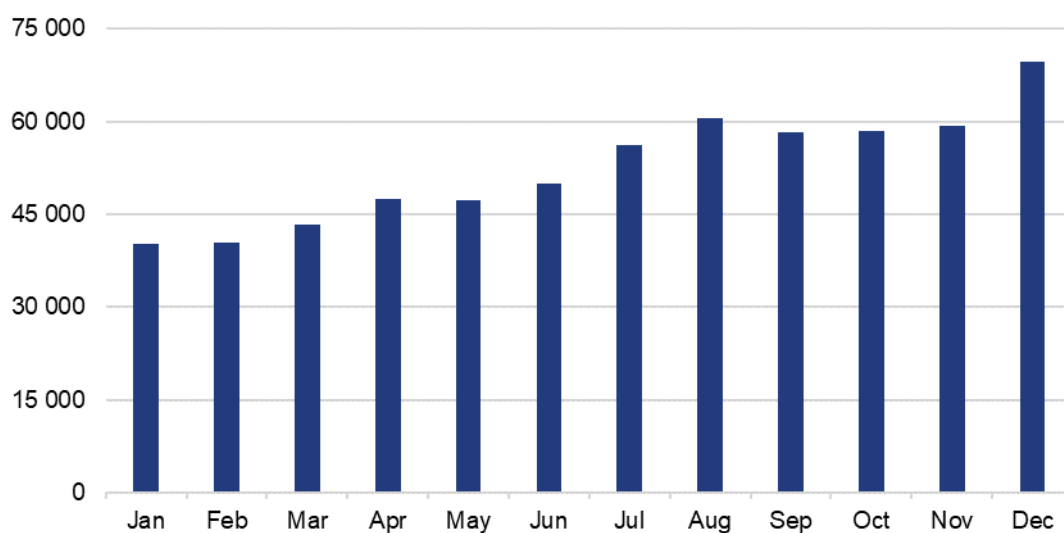
¹⁹³ Source: MOBI.Data, <https://www.mobie.pt/mobidata/data>

The number of electric vehicles in Portugal has also been increasing, with a growth of 50% in 2023 compared to the previous year, in the segment of light passenger and commercial vehicles¹⁹⁴, totalling 205 623 vehicles, of which approximately 45% are plug-in hybrids¹⁹⁵.

The number of electric vehicles per charging point in Portugal was 24 at the end of 2023, compared to an EU average of 14¹⁹⁶.

A set of figures with the evolution of the number of users, number of vehicle charges and amount of energy charged in the electric mobility network managed by EGME is presented below.

Figure 6-1 – Average number of users in the electric mobility network, in 2023



Source: MOBI.E, S.A. data¹⁹⁷

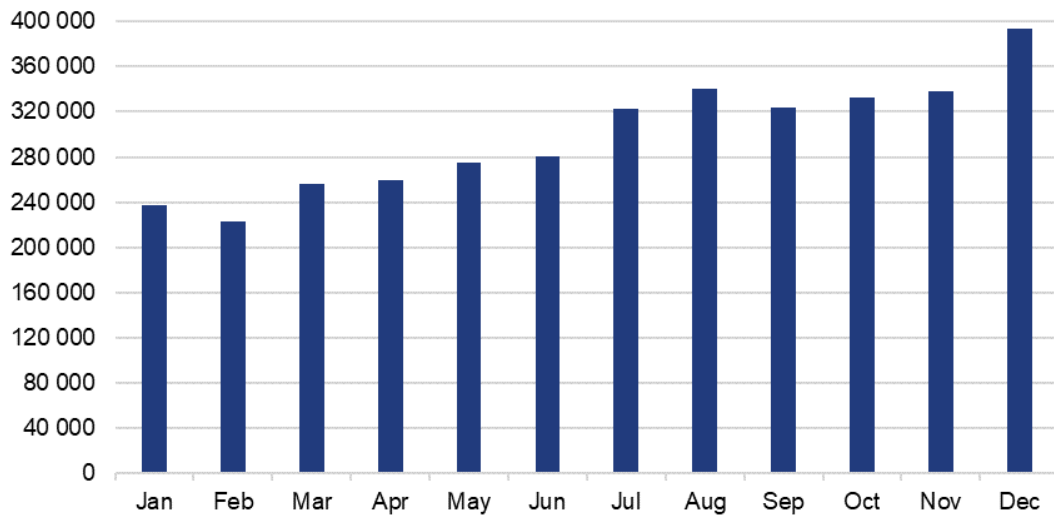
¹⁹⁴ Source: European Alternative Fuels Observatory (EAFO), <https://www.eafo.eu/>

¹⁹⁵ Source: European Alternative Fuels Observatory (EAFO), <https://www.eafo.eu/>

¹⁹⁶ Source: European Alternative Fuels Observatory (EAFO), <https://www.eafo.eu/>

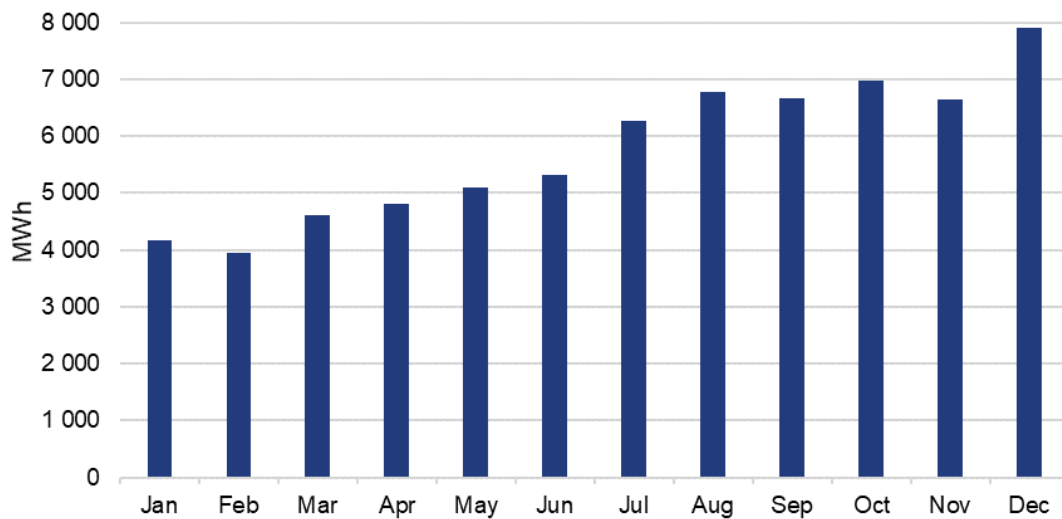
¹⁹⁷ <https://www.mobie.pt/mobidata/data>

Figure 6-2 – Number of vehicle charges in the electric mobility network, in 2023



Source: MOBI.E, S.A. data¹⁹⁸

Figure 6-3 – Energy charged in the electric mobility network, in 2023



Source: MOBI.E, S.A. data¹⁹⁹

¹⁹⁸ <https://www.mobie.pt/mobidata/data>

¹⁹⁹ <https://www.mobie.pt/mobidata/data>

ANNEXES

I. LIST OF ABBREVIATIONS AND ACRONYMS

- ACE - Energy Consumers Support Office in ERSE
- ACER - Agency for the Cooperation of Energy Regulators
- aFRR - exchange of balancing energy from frequency restoration reserves with automatic activation
- ANMP - National Association of Portuguese Municipalities
- APREN - Portuguese Renewable Energy Association
- bcm - billion cubic meters
- BmFRR - manual Frequency Restoration Reserves capacity market
- BSP - Balancing Service Provider
- CAE - Electricity Power Purchase Agreements
- CAPEX - Capital Expenditure
- CCCM SWE - Common Coordinated Capacity Calculation Methodology of the South-west European Region
- CCGT - Combined Cycle Gas Turbine
- CCR SWE - South-west Europe Capacity Calculation Region
- CDS - Credit Default Swaps
- CEER - Council of European Energy Regulators
- CEME - Electricity suppliers for electric mobility
- CIEG - General Economic Interest Costs
- CMEC - Costs of Maintenance of Contractual Equilibrium
- CNMC - Comisión Nacional de Mercados y Competencia (National Commission for Markets and Competition, Spain)
- CMVM - Comissão de Mercados e Valores Mobiliários (Securities Market Commission, Portugal)

- CNMV - Comisión Nacional de Mercados de Valores (National Securities Market Commission, Spain)
- CPF - Power Frequency Control
- CR3 - Concentration Ratio
- DGEG - Directorate-General for Energy and Geology
- DSO - Distribution System Operator
- EDA - Electricidade dos Açores
- EEGO - Procedures Manual of the Guarantees of Origin Issuing
- EEM - Empresa de Eletricidade da Madeira
- EGME - Managing entity of the electric mobility network
- EHV - Extra High Voltage (voltage between phases whose effective value is greater than 110 kV)
- ERI - Electricity Regional Initiative
- ERSE - Energy Services Regulatory Authority
- EU ETS - European Union Emissions Trading Scheme
- FBDP - Base Daily Operating Schedule
- FCFS - First Come First Served
- FID – Final Investment Decision
- FTR - Financial Transmission Rights
- GGS - Global Manager of SEN
- GNR - National Republican Guard
- GO - Guarantees of Origin
- GRI - Gas Regional Initiative
- GRMS - Gas Regulation and Measurement Station
- GWh - Gigawatt hour (energy unit)
- HHI - Herfindahl-Hirschman Index

- HP - High Pressure (gas pressure whose value exceeds that of atmospheric pressure by more than 20 bar)
- HV - High Voltage (voltage between phases whose effective value is greater than 45 kV and less than or equal to 110 kV)
- IGCC - International Grid Control Cooperation
- IN – Imbalance Netting
- IPE - Imbalance netting Portugal-Spain interconnection
- ISH — Imbalance Settlement Harmonisation
- LNG - Liquefied Natural Gas
- LNGT - Liquefied Natural Gas Terminal
- LP - Low Pressure (gas pressure whose value is lower than that of atmospheric pressure by more than 4 bar)
- LV - Low Voltage (voltage between phases whose effective value is equal to or lower than 1 kV)
- MARI - Manually Activated Reserves Initiative
- mFRR - exchange of balancing energy from frequency restoration reserves with manual activation
- MIBEL - Iberian Electricity Market
- MIBGAS - Iberian Natural Gas Market
- MP - Medium pressure (gas pressure of 4 bar or more and equal to or less than 20 bar in relation to atmospheric pressure)
- MPAI - Manual of Procedures for Access to SNGN Infrastructures
- MPGGS - Manual of Procedures for Global Technical System Management of the Electrical System
- MPGTG - Manual of Procedures for Global Technical Management of the System
- MV - Medium Voltage (voltage between phases whose effective value is greater than 1 kV and less than or equal to 45 kV)
- MW - Megawatt (power unit)
- NEMO - Nominated Electricity Market Operator

- NRA - National Regulatory Authority
- NTC- Net transmission Capacity
- OLMCA – Supplier and aggregator’s switching logistics operator
- OMI - Iberian Market Operator
- OMIE - Iberian Energy Market Operator – Spanish Section, S.A.
- OMIP - Iberian Market Operator - Portuguese Section
- OPEX - Operational Expenditure
- OPC - Charging point operators
- OT - Treasury Bonds
- OTC - Over-The-Counter
- p.p. - percentage points
- PCI - Project of Common Interest
- PDIR - Development and Investment Plan of the RNTIAT
- PDIRGN - Development and Investment Plan for Natural Gas Transmission
- PDIRD-GN - Development and Investment Plan for Natural Gas Distribution
- PICASSO - Platform for the International Coordination of the Automatic frequency restoration process and Stable System Operation
- PNBEPH - National Programme of Dams with Significant Hydroelectric Potential
- PNEC - National Energy and Climate Plan
- PPA – Power Purchase Agreement
- RAA - Autonomous Region of the Azores
- RAM - Autonomous Region of Madeira
- RARII - Access to Networks, Infrastructures and Interconnections Code
- RCC - Regional Capacity Calculator
- REC - Renewable Energy Communities

- REE – Red Eléctrica (Spain)
- REMIT - Regulation on Wholesale Energy Market Integrity and Transparency
- REN - Rede Eléctrica Nacional, S.A.
- RND - National Distribution Network in HV and MV
- RNT - National Electricity Transmission Network
- RNTGN - National Natural Gas Transmission Network
- RNTIAT - National Gas Transmission Network, Storage Infrastructure and LNG Terminal Network
- ROR - Network Operation Code
- RQS - Quality of Supply Code
- RR - Replacement Reserves
- RRC - Commercial Relations Code
- RSRI – Electricity Smart Grid Services Code
- RT - Tariff Code
- SEN - National Electricity System
- SOLR – Supplier of Last Resort
- SOR - System Operation Region
- SNGN - National Natural Gas System
- SpLV - Special Low Voltage (supply or deliveries in LV with a contracted power higher than 41.4 kW)
- SRG - Special Regime Generation
- StLV - Standard Low Voltage (supply or deliveries in LV with a contracted power equal to or lower than 41.4 kVA)
- SWE ERF - South West Capacity Calculation Region European Energy Regulators Forum
- SWE REM - South West Europe Regional Electricity Market
- TERRE - Trans European Replacement Reserves Exchange
- TOTEX - Total Expenditure

- TR - Real Time
- TSO - Transmission System Operator
- UPAC – Self-Consumption Generation Unit
- UVE - Electric vehicle user
- VIP - Virtual Interconnection Point
- VP - Valuation Parameter
- VTP- Virtual Trading Point
- WACC – Weighted Average Cost of Capital
- WAP - Weighted Average Gas Price
- XBID - Intraday Continuous Market Prices

II. LIST OF LEGISLATION

A. NATIONAL LEGISLATION

In 2023, the following legal acts were published in Portugal with relevance for ERSE's activities:

- Government Order no. 15/2023, of January 4 - Establishes the centralised purchasing system for biomethane and hydrogen produced by electrolysis from water, using electricity from renewable energy sources;
- Order no. 163/2023, of 4 January - Completion of the process of abolishing the Permanent Forest Fund, the Innovation Support Fund, the Energy Efficiency Fund and the Fund for the Systemic Sustainability of the Energy Sector, and transferring their respective attributions to the Environmental Fund;
- Regional Legislative Act no. 10/2023/M, of January 19 - Establishes the organisation and operation of the electricity system in the Autonomous Region of Madeira, adapting the regime set out in Decree Law no. 15/2022, of January 14;
- Order no. 1396-C/2023, of January 27 - Opening of the public hearing, for a period of 30 days, of the preliminary proposal for the spatialised areas for the planning and operation of power generation centres based on renewable energy sources of ocean origin or location;
- Decree Law no. 6/2023, of 27 January - Strengthens the "Supporting Gas-Intensive Industries" incentive system;
- Government Order no. 38-B/2023, of 3 February - Suspends the updating of the CO₂ emissions surcharge;
- Regional Regulatory Decree no. 6/2023/M, of 15 February - Approves the regime applicable to the production of electricity under a special regime from renewable energy sources, based on a single production technology, with an installed capacity equal to or less than 5MW;
- Resolution of the Legislative Assembly of the Autonomous Region of the Azores no. 5/2023/A, of February 20 - Creation of a regional energy saving plan and support measures for families and companies to stabilise the prices of goods and services;

- Order no. 2789-I/2023, of February 28 - Establishes the Monitoring Committee of the Climate Action and Sustainability Programme (PACS);
- Act no. 10/2023 of 3 March - Completes the transposition of Directive (EU) 2019/2161 on consumer protection;
- Government Order no. 65-A/2023, of 3 March - Suspends the updating of the CO₂ emissions surcharge;
- Decree Law no. 21-B/2023, of 30 March - Amends the exceptional and temporary mechanism for adjusting electricity production costs within the scope of the Iberian Electricity Market;
- Decree Law no. 26/2023, of 10 April - Clarifies the environmental assessment regime applicable to maritime space allocation plans;
- Order no. 4445/2023, of 12 April - Declaring the expiry of the concession contract for the production of hydroelectric power at the Cabril hydroelectric scheme;
- Order no. 5748/2023, of 22 May - Defines the parameter corresponding to the impact of extra-market measures and events registered within the European Union on the formation of average electricity prices on the wholesale market in Portugal, to be applied between 1 January and 31 December 2023;
- Order no. 6289/2023, of 7 June - Determines the social tariff for natural gas supply in 2023-2024;
- Act no. 31/2023, of 4 July - Termination of laws published in the context of the COVID-19 disease pandemic;
- Order no. 7310/2023, of 11 July - Establishes the conditions applicable to the dominant operators of the National Gas System in the performance of the market creation service;
- Decree Law no. 80/2023, of 6 September - Establishes the exceptional procedure for allocating grid connection capacity to electricity consumption facilities in areas of high demand;
- Government Order no. 300/2023, of 4 October - Defines the methodology for calculating the rate of return to be applied to the intertemporal transfer of permitted income relating to energy policy, sustainability and general economic interest costs;

- Order no. 10557/2023, of 16 October - Establishes the social tariff for electricity supply, applicable from 1 January 2024;
- Order no. 10727/2023, of 20 October - Return of funds to the State coffers by the Global Technical Manager of the National Gas System;
- Order no. 10736/2023, of October 20 - Defines the Working Group for the creation of the Innovation Centre for the Valorisation of Lithium (GTCIVaL);
- Order no. 11035/2023, of 27 October - Allocates revenue to reduce the National Electricity System's tariff deficit;
- Decree Law no. 104/2023, of 17 November - Changes the financing model for the social tariff;
- Decree Law no. 105/2023, of 17 November - Reformulates the procedures for applications for the installation and operation of new biomass recovery plants;
- Order no. 11808/2023, of 22 November - Determines a set of actions aimed at simplifying the process of installing submarine cables and associated infrastructure;
- Order no. 11912/2023, of 23 November - Creates a working group called "Working Group for the Definition of Renewable Energy Acceleration Areas (GTAER)";
- Government Order no. 397/2023, of 28 November - Regulates the standard documents for the public tender procedure for the award of low-voltage electricity distribution concessions in mainland Portugal;
- Declaration of Rectification no. 33/2023, of 22 December - Rectifies Decree Law no. 104/2023, of 17 November, which amends the financing model for the social tariff;
- Order no. 13288-B/2023, of 29 December - Approves the clarification of the procedure to be adopted in the licensing leading to the exercise of the industrial activity of production of hydrogen of renewable origin.

In preparing this report, the following national legislation was taken into account:

- Act no. 144/2015, of 8 September, as amended, transposing Directive 2013/11/EU of the European Parliament and of the Council of 21 May 2013 on alternative dispute resolution for consumer disputes, which establishes the legal framework for out-of-court settlement mechanisms for consumer disputes;
- Act no. 10/2023, of 3 March - Completes the transposition of Directive (EU) 2019/2161 on consumer protection;
- Act no. 75/2015, of 28 July, in its current wording, which establishes the regime for access to and exercise of the activity of providing auditing services for cogeneration production facilities or production from renewable energy sources;
- Act no. 9/2013, of 28 January, which approves the Energy Sector Sanctions Regime, transposing, in addition to amending the Statutes of the Energy Services Regulatory Authority, Directives 2009/72/CE and 2009/73/CE of the European Parliament and of the Council, of 13 July 2009, which establish common rules for the internal market in electricity and natural gas and repeal Directives 2003/54/CE and 2003/55/CE of the European Parliament and of the Council, of 26 June 2003;
- Decree Law no. 57/2008, of 26 March, as amended, which establishes the legal framework applicable to unfair business-to-consumer commercial practices occurring before, during or after a commercial transaction relating to a good or service, thus clarifying the transposition of Directive 2005/29/CE of the European Parliament and of the Council, of 11 May 2005;
- Decree Law no. 68-A/2015, of 30 April, as amended, which establishes provisions on energy efficiency and cogeneration production, transposing Directive 2012/27/CE of the European Parliament and of the Council of 25 October 2012 on energy efficiency;
- Decree Law no. 15/2015, of 30 January, as amended, which establishes the regime for the extinction of regulated tariffs. This law changes the way in which the period of application of the respective transitional tariffs for the supply of natural gas and electricity to final customers with annual consumption of less than or equal to 10,000 m³ and normal low voltage consumption is set, and establishes a ban on free market suppliers indexing contract prices to the transitional tariff for sales to final customers;

- Government Order no. 59/2013, of 11 February, as amended, which sets the date for the end of transitional tariffs for the supply of natural gas to end customers with annual consumption of more than 10000m³;
- Government Order no. 27/2014, of 4 February, in its current wording, which sets the date for last resort suppliers to continue supplying electricity to end customers with consumption in HV, MV and BTE who have not contracted their supply on the free market;
- Decree Law no. 62/2020, of 28 August, as amended, which establishes the organisation and operation of the National Gas System and the respective legal regime and transposes Directive 2019/692;
- Decree Law no. 15/2022, of January 14, as amended, which establishes the organisation and operation of the National Electricity System, transposing Directive (EU) 2019/944 and Directive (EU) 2018/2001;
- Resolution of the Assembly of the Republic no. 23/2006, of 23 March, approving the Agreement between the Portuguese Republic and the Kingdom of Spain for the Establishment of an Iberian Electricity Market (MIBEL), signed in Santiago de Compostela on 1 October 2004;
- Resolution of the Council of Ministers no. 53/2020, of 10 July, approving the National Energy and Climate Plan 2030 (PNEC 2030);
- Government Order no. 643/2015, of August 21, which establishes the percentages of companies' shareholdings in the company MIBGAS, S. A., a company authorised to act as the management entity of the organised gas market, on a spot basis, within the scope of the creation of the Iberian Natural Gas Market (MIBGAS);
- Government Order no. 178-B/2016, of 1 July, as amended, which establishes the procedures, model and other conditions necessary for the application of the amendments to article 6 of Decree Law no. 138-A/2010, of 28 December, amended by Decree Law no. 172/2014, of 14 November, and by Law no. 7-A/2016, of 30 March, which creates a single, automatic model for the allocation of the social tariff for the supply of electricity to economically vulnerable customers;

- Government Order no. 108-A/2015, of 14 April, as amended, which defines the mechanism for determining the aggravation factor included in the transitional tariff for the sale of natural gas to end customers;
- Government Order no. 97/2015, of 30 March, as amended, approving the new dates for the period of application of the transitional tariffs for sales to final customers of natural gas with annual consumption of less than or equal to 10,000 m³ and electricity with normal low voltage consumption;
- Government Order no. 332/2012, of 22 October, as amended, which establishes the criteria for the differentiated passing on of costs arising from energy policy, sustainability or general economic interest measures in the overall system use tariff applicable to the activities of the National Electricity System;
- Regulation no. 1129/2020, of 30 December, as amended, which approves the Commercial Relations Code for the Electricity and Gas Sectors and repeals Regulation no. 561/2014, of 22 December and Regulation no. 416/2016, of 29 April;
- Regulation no. 785/2021, of 23 August, rectified by declaration of rectification no. 813/2021, of 16 November 2021, which approves the Electricity Tariff Code;
- Regulation no. 368/2021, of 28 April, which approves the Gas Tariff Code,
- Regulation no. 557/2014, of 19 December, amended by Regulation no. 621/2017, of 18 December, which approves the Electricity Network Operation Code;
- Regulation no. 406/2021, of 12 May, which approves the Quality of Service Codes for the Electricity and Gas Sectors;
- Regulation no. 407/2021, of 12 May, approving the Code on Access to Natural Gas Networks, Infrastructures and Interconnections;
- Regulation no. 373/2021, of 5 May, approving the Electricity Self-Consumption Code;
- Regulation no. 814/2023, of 27 July, approving the Code on the Misappropriation of Energy;
- Regulation no. 815/2023, of 27 July, which approves the Electricity Sector Self-Consumption Code and repeals Regulation no. 373/2021, of 5 May;

- Regulation no. 816/2023, of 27 July, which approves the Electricity Sector Network Operation Code and repeals Regulation no. 557/2014, of 19 December, and Regulation no. 621/2017, of 18 December;
- Regulation no. 817/2023, of 27 July, which approves the Code on Electricity Smart Grid Services and repeals Regulation no. 610/2019, of 2 August;
- Regulation no. 818/2023, of 27 July, approving the Code on Access to Electricity Sector Networks and Interconnections and repealing Regulation no. 560/2014, of 22 December, and Regulation no. 620/2017, of 18 December;
- Regulation no. 825/2023, of 28 July, which approves the Gas Tariff Code and repeals Regulation no. 368/2021, of 28 April, and Regulation no. 538/2022, of 28 June.
- Regulation no. 826/2023, of 28 July, which approves the Quality of Service Codes for the Electricity and Gas Sectors and repeals Regulation no. 406/2021, of 12 May;
- Regulation no. 827/2023, of 28 July, which approves the Commercial Relations Code for the Electricity and Gas Sectors and repeals Regulation no. 1129/2020, of 30 December;
- Regulation no. 828/2023, of 28 July, which approves the Electricity Tariff Code and repeals Regulation no. 785/2021, of 23 August;
- Directive no. 14/2020, of 30 September, which approves the rules for trading products with VTP delivery on the MIBGAS platform and associated procedures;
- Directive no. 5/2016, of 26 February, which approves the Guide to the Measurement, Reading and Availability of Electricity Data in mainland Portugal;
- Directive no. 15/2015 of 9 October, which establishes the commercial margins for market agents;
- Directive no. 8/2015, of 27 May, which details the detailed operating procedures for applying these adjustments;
- Directive no. 6/2015, of 27 April, on pre-contractual and contractual provision to electricity consumers, which establishes the obligation to disclose and harmonise the content of the conditions for providing pre-contractual and contractual information to electricity consumers in mainland Portugal;

- Directive no. 13/2017, of 28 July, which repealed ERSE Directive no. 14/2014, of 4 August, amended by Directive no. 7/2020, of 21 April, approving the Manual of Procedures for Access to Infrastructures;
- Order no. 10835/2020, of 4 November, which establishes the power reduction of special regime production that benefits from a guaranteed remuneration scheme or another subsidised remuneration support scheme.
- Order no. 3677/2011, of 24 February, which establishes the monitoring of reference prices and average prices practised by natural gas suppliers, in order to implement the information requirements to be established with suppliers regarding the calculation and sending of both the reference prices that suppliers expect to practise on the market and the average prices actually practised;
- Order no. 18637/2010, of 15 December, which establishes the monitoring of reference prices and average prices practised by electricity suppliers, in order to implement the information requirements to be established with suppliers regarding the calculation and sending of both the reference prices that suppliers expect to practise on the market and the average prices actually practised. This order amends Order no. 9244/2009, incorporating some changes to the methodology for calculating reference prices and average prices charged;
- Decision no. 1/2014, of 21 February, approving the capacity allocation processes at the virtual natural gas interconnection point between Portugal and Spain;
- Directive no. 7/2018, of 28 March, approving the Guide to Measurement, Reading and Data Availability in the natural gas sector;
- Regulation no. 610/2019, of 2 August, approving the Code on Electricity Smart Grid Services;
- Regulation no. 854/2019, of 4 November, approving the Electric Mobility Code;
- Regulation no. 266/2020, of 20 March, approving the Electricity Self-Consumption Code;
- Regulation no. 814/2023, of 27 July, approving the Code on the Misappropriation of Energy;
- Order no. 1112/2022, of 27 January, approving the Regulations for the Underground Storage of Gas in Natural Salt Formations;

- Order no. 1113/2022, of 27 January, approving the Regulations for the Liquefied Natural Gas (LNG) Reception, Storage and Regasification Terminal;
- Order no. 98-A/2022, of 18 February, approving the Regulation of the Incentive System to Support the Production of Renewable Hydrogen and Other Renewable Gases;
- Government Order no. 59/2022, of 28 January, which sets the minimum overall quantity of gas security reserves and determines the constitution of an additional reserve in the National Gas System;
- Order no. 1322/2022, of 1 February, which defines the parameter corresponding to the impact of extra-market measures and events registered within the European Union on the formation of average electricity prices on the wholesale market in Portugal, to be applied between 1 January and 31 March 2022;
- Declaration of Rectification no. 11-A/2022, of March 14, which rectifies Decree Law no. 15/2022, of January 14, which establishes the organisation and operation of the National Electricity System, transposing Directive (EU) 2019/944 and Directive (EU) 2018/2001;
- Order no. 112/2022, of 14 March, which regulates the Electointensive Customer Statute;
- Order no. 4049/2022, of 7 April, which defines the discount to be applied to tariffs for access to natural gas networks;
- Decree Law no. 30-A/2022, of 18 April, as amended, which approves exceptional measures aimed at simplifying procedures for producing energy from renewable sources;
- Decree Law no. 30-B/2022 of 18 April, as amended, approving the "Supporting Gas-Intensive Industries" incentive system;
- Decree Law no. 78-A/2022, of 15 November, which reinforces the "Supporting Gas-Intensive Industries" incentive system, creates a line of financing for the social sector and regulates the payment of extraordinary support to income and social benefit holders;
- Decree Law no. 33/2022, of 14 May, as amended, which establishes an exceptional and temporary mechanism for adjusting electricity production costs within the scope of the Iberian Electricity Market;

- Order no. 9799-B/2022, of 8 August, as amended, which establishes the procedure for prior validation of invoices determined by Order no. 9501-A/2022, of 2 August;
- Order no. 9838/2022, of 9 August, which defines the parameter corresponding to the impact of extra-market measures and events registered within the European Union on the formation of average electricity prices on the wholesale market in Portugal, to be applied between 1 July and 31 December 2022;
- Decree Law no. 57-B/2022, of 6 September, which allows end customers with annual consumption of less than or equal to 10,000 m³ to return to the regulated tariff system for the sale of natural gas;
- Decree Law no. 71/2022 of 14 October, which completes the transposition of Directive (EU) 2018/2002, amending provisions on energy efficiency and cogeneration production;
- Decree Law no. 72/2022, of 19 October, as amended, which amends the exceptional measures for the implementation of projects and initiatives for the production and storage of energy from renewable sources;
- Decree Law no. 84-D/2022 of 9 December, as amended, which approves the creation of the transitional gas price stabilisation regime for legal persons with consumption of more than 10 000 m³;
- Decree Law no. 104/2023, of 17 November - Changes the financing model for the social tariff.

B. EU LEGISLATION

The following EU legislation was taken into account in the preparation of this report:

- Directive 2009/29/CE of the European Parliament and of the Council of 23 April 2009 amending Directive 2003/87/CE so as to improve and extend the greenhouse gas emission allowance trading system of the Community;
- Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources;

- Directive (EU) 2019/692 of the European Parliament and of the Council of 17 April 2019 amending Directive 2009/73/CE concerning common rules for the internal market in natural gas;
- Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 concerning common rules for the internal market in electricity and amending Directive 2012/27/EU;
- Commission Regulation (EU) 2015/1222 of 24 July 2015 laying down guidelines for capacity allocation and congestion management;
- Commission Regulation (EU) 2015/703 of 30 April 2015 establishing a network code for interoperability and data exchange rules;
- Commission Implementing Regulation (EU) 1348/2014 of 17 December 2014 on data reporting implementing article 8(2) and (6) of Regulation (EU) 1227/2011 of the European Parliament and of the Council on wholesale energy market integrity and transparency;
- Commission Regulation (EU) 543/2013, of 14 June 2013 on the presentation and publication of data from electricity markets and amending Annex I to Regulation (EC) No 714/2009 of the European Parliament and of the Council, as amended by Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019;
- Commission Regulation (EU) 2017/2195 of 23 November 2017 laying down guidelines for balancing the electricity system, as amended by Commission Implementing Regulation (EU) 2021/280 of 22 February 2021;
- Commission Regulation (EU) 2017/459 of 16 March 2017 establishing a network code for capacity allocation mechanisms in gas transmission networks and repealing Regulation (EU) No 984/2013;
- Regulation (EU) 1227/2011 of the European Parliament and of the Council of 25 October 2011 on wholesale energy market integrity and transparency (REMIT);
- Regulation (EU) 2017/1938 of the European Parliament and of the Council on measures to safeguard security of gas supply and repealing Regulation (EU) 994/2010, as amended by Commission Delegated Regulation (EU) 2022/517 of 18 November 2021;
- Regulation (CE) 715/2009 of the European Parliament and of the Council, of 13 July 2009 on conditions for access to the natural gas transmission networks and repealing Regulation (CE)

1775/2005, as amended by Regulation (EU) 2018/1999 of the European Parliament and of the Council, of 11 December 2018 on the Governance of the Energy Union and Climate Action and amending Regulations (CE) 663/2009 and (CE) 663/2009 and (CE) 715/2009 of the European Parliament and of the Council, Directives 94/22/CE, 98/70/CE, 2009/31/CE, 2009/73/CE, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652, and repealing Regulation (EU) 525/2013 of the European Parliament and of the Council;

- Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the internal market in electricity (recast);
- Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action, as amended by Decision (EU) 2019/504 of the European Parliament and of the Council of 19 March 2019 and by Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021;
- Regulation (EU) 2019/941 of the European Parliament and of the Council, of 5 June 2019 on risk-preparedness in the electricity sector and repealing Directive 2005/89/CE;
- Regulation (EU) 2019/942 of the European Parliament and of the Council, of 5 June 2019 establishing a European Union Agency for the Cooperation of Energy Regulators (recast);
- Council Regulation (EU) 2023/706, of 30 March 2023 amending Regulation (EU) 2022/1369 as regards the extension of the demand reduction period for gas demand reduction measures and the reinforcement of reporting and monitoring of the implementation of such measures;
- Regulation (EU) 2023/1804 of the European Parliament and of the Council of 13 September 2023 on the deployment of alternative fuels infrastructure, and repealing Directive 2014/94/EU;
- Directive (EU) 2023/2413 of the European Parliament and of the Council, of 18 October 2023 amending Directive (EU) 2018/2001, Regulation (EU) 2018/1999 and Directive 98/70/CE with regard to the promotion of energy from renewable sources and repealing Council Directive (EU) 2015/652;

- Directive (EU) 2018/844 of the European Parliament and of the Council, of 30 May 2018 amending Directive 2010/31/EU on the energy performance of buildings and Directive 2012/27/EU on energy efficiency;
- Directive (EU) 2018/2002 of the European Parliament and of the Council, of 11 December 2018 amending Directive 2012/27/EU on energy efficiency;
- Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 recasting Directive 2009/28/CE on the promotion of the use of energy from renewable sources, as amended by Corrigendum, OJ L 311, 25.9.2020, p. 11 (2018/2001) and by Corrigendum, OJ L 041, 22.2.2022, p. 37 (2018/2001);
- Directive (EU) 2019/944 of the European Parliament and of the Council, of 5 June 2019 concerning common rules for the internal market in electricity and amending Directive 2012/27/EU (recast), and repealing Directive 2009/72/CE with effect from 1 January 2021;

III. INDICATORS OF TECHNICAL CONTINUITY OF SUPPLY (APPLICABLE TO THE ELECTRICITY SECTOR)

TIE	Equivalent Interruption Time: indicator applicable to the transmission network. This expresses the system's downtime (applicable to long-term interruptions), based on the average value of the expected annual capacity (Pme)
TIEPI	Installed Capacity Equivalent Interruption Time: Indicator applicable to the MV distribution network. This shows the duration of the downtime (applicable to long-term interruptions) of the installed capacity in transformer stations
SAIDI	Average duration of long system interruptions: indicator applying to the transmission and distribution networks
SAIFI	Average frequency of long system interruptions: indicator applying to the transmission and distribution networks
MAIFI	Average frequency of short system interruptions: indicator applying to the transmission and distribution networks

Note: Long interruptions - Interruptions with a duration longer than 3 minutes. Short interruptions - Interruptions with a duration between 1 second and 3 minutes, inclusive.



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