ERSE
ENTIDADE REGULADORA
DOS SERVIÇOS ENERGÉTICOS

ANNUAL REPORT ON THE ELETRICITY AND NATURAL GAS MARKETS IN 2021

PORTUGAL

EN

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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.

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

Therefore, the present report complies with the provisions of Directives 2019/944[1] 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 2019/692[2] 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 its activities and on any developments observed in the electricity and natural gas markets.

The report follows the structure proposed at European level and presents the main developments in the electricity and natural gas markets in Portugal in 2021, 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 analysis and statistical data presented cover essentially the year 2021, which was marked by the COVID-19 pandemic with a significant impact on society as well as on regulation and the markets.

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.

[1] Transposed into national law by Decree-Law n.º 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 n.º 162/2019, of 25 October (approves the legal regime applicable to renewable self-consumption).

[2] Transposed into national law by Decree-Law n.º 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

2021 was marked by the effects of COVID-19 with regard to energy consumption. Electricity consumption, despite being higher than in 2020, did not reach the 2019 figure, remaining 1.7% below. In the case of natural gas consumption, in 2021 it decreased by 4.6% compared to 2020, still representing a reduction of 6.1% from the 2019 level. The largest contribution to the fall in natural gas consumption was made by large industrial consumers at high pressure (with an annual reduction of 12%).

In electricity production, the hydrological year was dry (annual hydroelectric productivity index of 0.93), which was reflected in hydroelectric generation. The wind power productivity index increased to 1.01 compared to the previous year, and there was also a 2.3% increase in installed power. Satisfaction of consumption by renewable generation rose from 59% in 2020 to 63% in 2021,[3] despite the unfavourable hydrological variability.

In 2021, both coal-fired power plants in Portugal, Sines and Pego, were closed, constituting a landmark moment for the Portuguese electricity system. On the other hand, the electricity import balance grew from 1.5 TWh in 2020 to 4.8 TWh in 2021.

Installed capacity in generation decreased compared to 2020, due to the decommissioning of the coal power stations in Pego and Sines, totalling 1756 MW. Nonetheless, renewable generation continued to increase in installed capacity, especially solar photovoltaic power with an additional 508 MW (an increase of 58%, not considering self-consumption[4]) and also wind power with an additional 122 MW (an increase of 7%).

[3] «Estatísticas rápidas "Renováveis" n.º 205» (December 2021), DGEG.

[4] Considering the registered self-consumption installations, the increase in photovoltaic installed power was 701 MW (65%).

Renewable Energy Sources

The total installed capacity in renewable generation increased by 4.5% in 2021, mainly as a result of new solar photovoltaic power. The recent reserve power auctions for grid connection, focused on this technology, point to the continuation of this trend in the coming years.

Additionally, and in the context of the most recent 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 3% compared to the previous year. Hydropower plants contributed 27% of consumption[5]. Wind generation accounted for 26% of consumption, while the remaining renewables maintained a share equivalent to 2019.

Wholesale electricity and natural gas markets

At wholesale market level, the electricity sector registered the entry of a new producer – Movhera[6] - holder of hydro generation assets transferred from EDP Produção.

There was a decrease in installed generation, due to the decommissioning of coal-fired power stations the electricity generating system, 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 reduced hydroelectricity or the increase in commodity prices with an impact on the formation of wholesale electricity prices.

In terms of the natural gas wholesale market, 2021 marks the entry into operation, on 16 March, of the organised market for products with delivery at the VTP - Virtual Trading Point, on the MIBGAS platform. With this trading platform, the global technical manager (GTG) - responsible for clearing the gas transmission network - may now undertake clearing actions, through the purchase and sale of standard products (daily and intraday) on the market.

[5] Pumping included.

[6] Movhera is a company created by the ENGIE consortium, Crédit Agricole Assurances and Mirova - Natixis Group.

Between May and November 2021, the GTG also carried out a programme of purchases of filling and operation gas, totalling 390 GWh, to substitute the gas of the agents that until then had fulfilled this function.

Electricity and natural gas retail markets

In the retail market, a wide range of commercial offers continued to be available, including combined electricity and gas offers. Supplier switching decreased slightly, but continued at significant levels (approximately 17% for electricity and 15% for natural gas).

In 2021, in the electricity sector, about 95% of electricity consumption and 85% of customers were covered by free market contracts. Regarding natural gas, about 98% of consumption and 84% of customers were covered by the liberalised market.

In the electricity market, at the end of 2021, there were 30 free market suppliers, of which 29 served household customers and small companies (with contracted capacity up to 41.4 kVA). In relation to 2020, four electricity suppliers left the free market, with the last resort supply[7] being applied to two suppliers and the preventive last resort supply to two others, by application of exceptional measures within the scope of the National Electricity System and the National Gas System, established in ERSE's Regulation N.º 951/2021, of 2 November. In the natural gas market, 21 suppliers were present, of which 20 suppliers serving customers with consumption less than or equal to 500 m^3/year.

Since 2018, a legislative provision allows electricity customers in the liberalised market to opt for the same end-user tariffs as the regulated transitional ones, to be offered by suppliers in the liberalised market. If their supplier does not participate in this regime, customers can opt to be supplied by the supplier of last resort (SOLR). This measure, together with the application of last resort supply as described above, allowed the return of 29 328 consumers to the SOLR, corresponding to 5.5% of the total consumption of customers who changed supplier in the liberalised market to the return to the regulated market in 2021.

It is worth noting that 12.7% of electricity consumers and 2.2% of natural gas consumers in mainland Portugal were covered by the social tariff that grants a tariff discount regardless of the supplier they choose.

[7] The customers of the supplier that leaves the market are automatically supplied by the supplier of last resort, thus ensuring the continuity of supply.

Electricity and natural gas prices

Wholesale electricity and natural gas prices increased significantly in 2021 compared to 2020 (+330% in electricity prices and about +461% in natural gas prices).

Regulated network access tariffs varied 4.4% in electricity and between -32.2% and -1.9% in natural gas according to pressure levels and consumer type. In the electricity sector, from 1st July 2021 and again on 1st October 2021, the energy tariff prices applied by the supplier of last resort in the regulated market were revised upwards (5 EUR/MWh in each time), as a result of the energy prices increase in MIBEL, namely the spot market prices during the first months of 2021 and forward market prices for 2021 in general.

Other relevant market developments

2021 was still marked by the COVID-19 pandemic, as well as by the rise in prices in the electricity and natural gas wholesale markets, which forced regulators to respond effectively to the challenges that arose. In this sense, and similarly to the previous year, ERSE approved and published several regulations and instructions regarding the conditions for the provision of energy supply services as essential public service to consumers.

Measures enacted by ERSE to protect consumers included the prohibition of interruption of supply and the possibility of staggering the payment of bills. For business customers - while in a situation of business crisis and reduced activity – the possibility was foreseen to request to change power or capacity, the fixed term, as well as energy charges to be billed referring to the supply of electricity and natural gas.

As regards suppliers, the possibility was given for them to request to pay the network operator in instalments for the amounts related to network access owed by customers, in line with the cases provided for in the regulations. The deadline for reporting information to ERSE regarding electricity labelling and quality of commercial service was also prolonged.

At a regulatory level, the revision of the gas regulations stands out, which materialized the organizational bases for the gas sector, as amended by Decree-Law no. 62/2020, of 28 August, adapting the regulatory framework for gases of renewable origin or with low carbon content injection in the networks. The regulatory review also concluded the implementation of the European gas transmission network clearing code, incorporating the start-up of the organized market platform for carrying out clearing actions by GTG.

2.2 REPORT ON THE IMPLEMENTATION OF THE CLEAN ENERGY PACKAGE

In October 2019, Decree-Law N.º 162/2019 was approved which established the new legal regime for self-consumption of electricity and for renewable energy communities, partially transposing 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.

Against this background, ERSE published its Code No. 266/2020, of 20 March, which integrated the new modalities of self-consumption in the regulation of the electricity sector. At the end of 2020, ERSE launched a public consultation to review this code, due to the entry into force (in 2021) of legal provisions provided for in the aforementioned law and, at the same time, responding to the various needs demonstrated by the market actors. The new code (No. 373/2021 of 5 May) created a more comprehensive and clearer framework of rules, with emphasis on the inclusion of energy storage activities in the context of self-consumption, and the possibility of implementing pilot projects.

At the end of 2021, a new decree-law was in the process of being published, which was published in early 2022[8], with the aim of reviewing the legislation on the basis of the functioning of the national electricity system, including the subjects contained in the new Decree-Law No. 162/2019. This new Decree-Law also included subjects relating to the Clean Energy Package, which were not yet included in legislation, such as those relating to the active participation of consumers in production and markets, including citizen energy communities.

It is also to be noted that in February 2020, ERSE launched a public consultation on a proposal to revise the rules of its Programme for the Promotion of Efficiency in Electricity Consumption (PPEC)[9], in order to adapt the programme to the energy transition (considering the energy efficiency provisions under the Clean Energy Package) and the integration of sectors (electricity and gas), with a focus on promoting the efficient use of energy. This proposal incorporated a set of significant contributions received in the context of the prior public consultation[10], which took place in 2019, maintaining, nevertheless, the basic structure of the PPEC, with regard to tenders, activity segments and types of measures. The new PPEC Regulation was published in April 2021, through Regulation No. 343/2021, of 15 April.

[8] Decree-Law n.º 15/2022, of 14th January.

[9] Public consultation n. 86.

[10] Public consultation n. 77.

3 ELECTRICITY MARKET

3.1 NETWORK REGULATION

3.1.1 TECHNICAL FUNCTIONING

3.1.1.1 BALANCING

Imbalances between production and demand and technical constraints are dealt within the scope of the ancillary services market, which is managed by REN in its capacity as Global Technical System Manager, as set out in ERSE's Network Operation Code (ROR)[11], and in ERSE's Manual of Procedures for Global Technical System Management of the Electrical System (MPGGS)[12].

The energy mobilised to resolve technical constraints and the contracted secondary control band involve costs that are paid by all customers. Additionally, the costs of mobilising secondary control reserve and reserve energy, for each hourly period, which are used to cancel out agents' imbalances in real time, are paid by all the market agents that have deviated in that period.

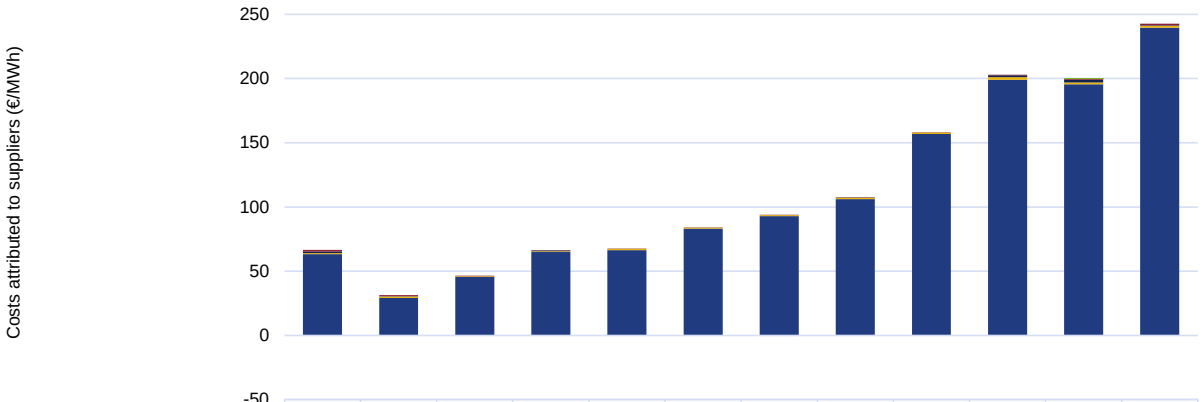
Figure 3-1 shows the impact of the daily, intraday and ancillary services markets on the costs allocated to suppliers in 2021, including the breakdown of the share in the daily and intraday markets and the ancillary services market.

Figure 3-1 also illustrates that the price of the ancillary services market can be explained mainly by the cost of secondary band contracting, imbalance and real-time technical restrictions, with less impact on the remaining components.

[11] The ERSE Network Operation Code (ROR) was approved by Regulation No. 557/2014, of 19 December, amended by Regulation No. 621/2017, of 18 December.

[12] The ERSE Manual of Procedures for Global Technical System Management (MPGGS) was approved by Directive no. 10/2018, of 10 July, amended by Directive no. 14/2018, of 10 August, by Directive no. 9/2020, of 29 May and by Directive no. 4/2021, of 25 January.

Figure 3-1 - Impact of daily, intraday[13] and ancillary services markets on the costs allocated to suppliers operating in Portugal, in 2021



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Total ancillary services markets	3.13	2.33	0.72	1.35	1.32	0.94	0.48	1.73	1.05	3.88	4.12	3.19
FBDP Technical constraints	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
RT Technical constraints	1.11	0.89	0.26	0.20	0.29	0.20	0.09	0.17	0.15	0.41	0.61	1.34
Imbalances	1.37	0.25	-0.20	0.54	-0.01	-0.02	-0.42	0.30	-0.32	1.45	1.99	0.40
Extraordinary secondary band	0.00	0.00	0.00	0.00	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.01
Secondary band	0.65	1.19	0.66	0.60	1.02	0.76	0.80	1.26	1.21	2.01	1.50	1.45
Daily and Intraday Market	63.37	29.17	45.50	64.94	66.34	83.20	92.81	106.10	156.86	199.04	195.57	239.56

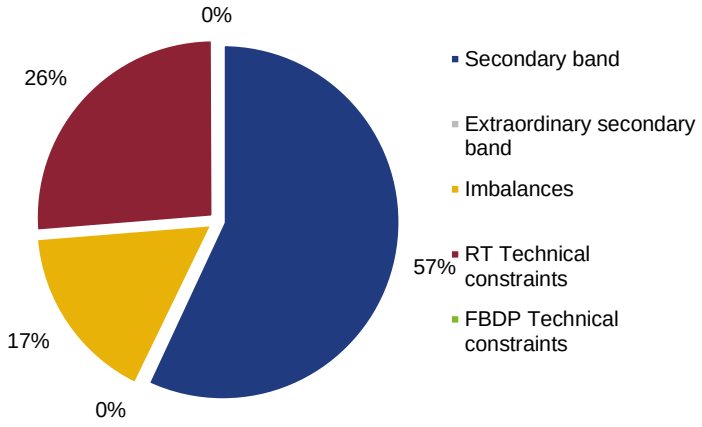
Source: REN data. Note: FBDP – Daily Base Operating Schedule and RT - Real Time.

In 2021, the ancillary services market represented a weighted average cost of approximately 2.0 €/MWh, against a weighted marginal price in the daily and intraday markets of approximately 113.38 €/MWh. This translates into a significant increase in the average daily and intraday market price of around 326% compared to the previous year, higher than the average cost of the system services market, which increased by 194% compared to the value recorded in 2020.

Figure 3-2 presents the cost breakdown of the ancillary services market and shows that the most important components relate to secondary band contracting, imbalances and technical restrictions.

[13] Excludes the intraday and continuous market, due to the application of the model provided for in the CACM GL (XBID) as set in Regulation (UE) no 2015/1222 of the European Commission.

Figure 3-2 - Breakdown of costs of the ancillary services market, 2021



Source: REN data

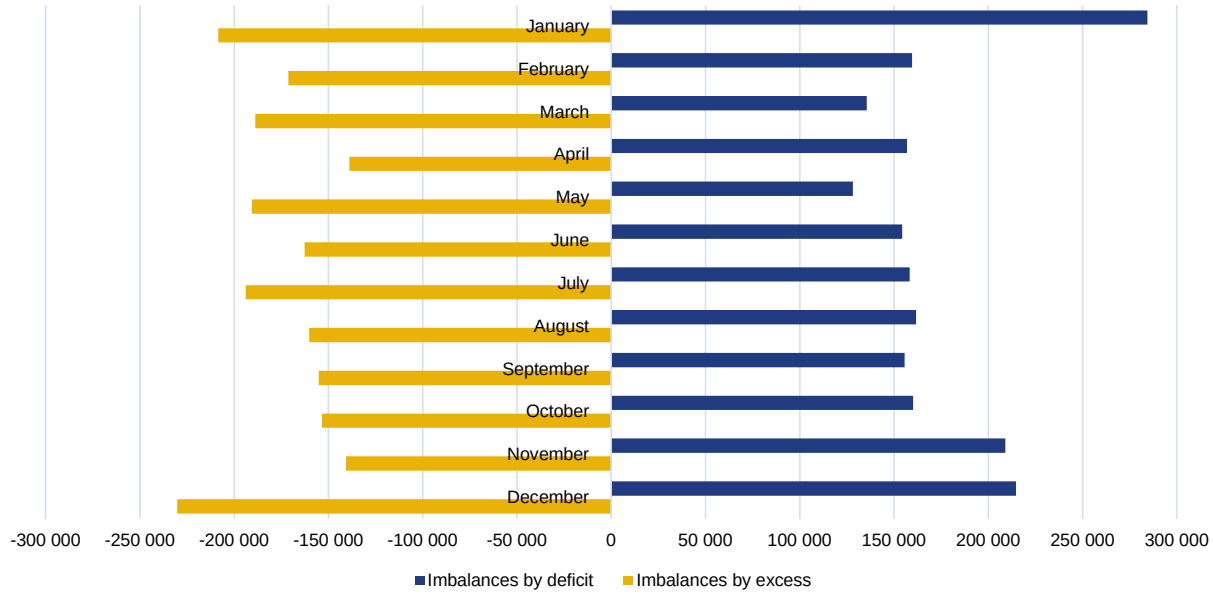
The monetary value of imbalances for each hour corresponds to the variable costs of balancing, which is paid to the agents that correct the imbalance by participating in the ancillary services market.

Figure 3-3 shows the evolution of imbalance energy, by excess[14] and by deficit[15], observed during 2021. Compared to 2020, there was a slight increase in imbalances, either by default or by excess, more expressive in the case of imbalances due to excess.

[14] 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).

[15] 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, 2021



Source: REN data

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)[16] and Tariffs Code (RT) [17] include provisions for regulating the continuity of supply[18].

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

[16] Regulation n.º 406/2021 of 12 May, which approves the ERSE Quality of Supply Code for the electricity and gas sectors and the corresponding Manual of Procedures.

[17] Regulation n.º 785/2021 of 23 August, which approves the ERSE Tariff Code for the electricity sector.

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

short interruptions (between 1 second and 3 minutes), according to the MAIFI indicator (see the indicator definition list in Annex III). Table 3-1 shows the continuity of supply indicators for mainland Portugal[19] in 2021[20].

Table 3-1 - Continuity of supply indicators in mainland Portugal, 2021

Voltage Level	Indicator	Interruptions		
		Planned	Unplanned	
			Operator Responsibility	Exceptional Events
Transmission	TIE (min)	0	0.05	0
	SAIFI (int)	0	0.01	0
	SAIDI (min)	0	0.08	0
	MAIFI (int)	0	0.02	0
HV Distribution	SAIFI (int)	0.01	0.09	0.02
	SAIDI (min)	1.38	4.89	1.11
	MAIFI (int)	0	0.45	0
MV Distribution	TIEPI (min)	0.02	48.95	7.15
	SAIFI (int)	0	1.63	0.42
	SAIDI (min)	0.27	63.30	22.79
	MAIFI (int)	0	8.82	0.50
LV Distribution	SAIFI (int)	0.01	1.52	0.32
	SAIDI (min)	1.26	75.48	16.84

Source: REN and E-REDES data

Overall, in 2021, the continuity of supply indicators that assess the performance of the transmission network maintain the trend of values compared to the values recorded in recent years. In addition, the continuity of supply indicators that assess the performance of the distribution networks generally remained in line in general, compared to the previous year. This performance was due to the periodic maintenance services carried out on the electricity networks, carried out by the distribution network operator, and the reduction in the impact that exceptional events had on continuity of supply indicators.

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

[20] 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

In addition, the RQS sets 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 compensation[21] without the need for the customer to request it.

In 2021, there were 52 883 instances of non-compliance in mainland Portugal, which led to compensation in the amount of approximately 597 000 euros. In 2020, there were 23 207 instances of non-compliance in mainland Portugal, of which 21 758 were related to the duration of interruptions and 1 449 to the total number of interruptions, leading to compensation in the amount of approximately 262 000 euros.

Table 3-2 shows the continuity of supply indicators for the Autonomous Region of the Azores in 2021.

Table 3-2 - Continuity of supply indicators in the Autonomous Region of the Azores, 2021

Voltage Level	Indicator	Interruptions		
		Planned	Unplanned	
			Operator Responsibility	Exceptional Events
MV Distribution	TIEPI (min)	31.30	59.12	17.78
	SAIFI (int)	1.00	4.45	0.88
	SAIDI (min)	43.79	88.18	27.56
	MAIFI (int)	1.11	2.07	0.09
LV Distribution	SAIFI (int)	1.06	5.37	0.94
	SAIDI (min)	39.65	111.54	32.42

Source: EDA data

In 2021, the continuity of supply indicators that assess the performance of distribution networks in the Azores worsened compared to the previous year. These results were in large part due to an increase in unplanned interruptions. Note that the impact of the occurrence of unplanned interruptions classified as exceptional events was not very expressive in terms of continuity of supply indicators.

In 2021, there were 130 instances of non-compliance related to the duration of interruptions. Customers received 3 000 euros in compensation. In 2020, there were five instances of non-compliance, of which

[21] 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.

three related to the duration of interruptions and two related to the number of interruptions. Customers received 44 euros in compensation.

Table 3-3 shows the continuity of supply indicators for the Autonomous Region of Madeira, in 2021.

Table 3-3 - Continuity of supply indicators in the Autonomous Region of Madeira, 2021

Voltage Level	Indicator	Interruptions		
		Planned	Unplanned	
			Operator Responsibility	Exceptional Events
MV Distribution	TIEPI (min)	16.04	23.17	293.06
	SAIFI (int)	0.25	0.95	2.12
	SAIDI (min)	21.32	30.65	298.28
	MAIFI (int)	0.02	0.34	0.02
LV Distribution	SAIFI (int)	0.25	0.94	2.23
	SAIDI (min)	26.33	32.62	294.79

Source: EEM data

In 2021, the continuity of supply perceived by customers in the Autonomous Region of Madeira showed a deterioration compared to the previous year with regard to the SAIDI (average duration of interruptions) and SAIFI (average number of interruptions) indicators, essentially due to the occurrence of unplanned interruptions classified as exceptional events. The deterioration of the continuity of supply indicators was caused by the exceptional events that resulted from heavy rainfall and abnormal level of thunderstorm intensity that took place on 27 and 28 March 2021, on the island of Madeira. Due to these meteorological conditions, atmospheric discharges affected electrical infrastructures, causing the collapse of the electrical system on the island of Madeira.

In 2021, there were 46 instances of non-compliance related to the duration of the interruptions, mostly due to non-compliance at standard low voltage customers (LV), and customers received about 439 euros in compensation. In 2020, there were 124 instances of non-compliance related to the duration of the interruptions and customers received about 2 200 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 sector.

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 2021, the maximum value of the premium or penalty corresponded to 4 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[22].

"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 value of "component 2" is determined using the function established in the RQS. In 2021, the maximum value of the premium or penalty corresponded to 1 million euros. 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.

Regarding the value of the amount inherent to “component 1” of the incentive mechanism to improve the continuity of supply, based on the provisional values of 39 042 GWh of distributed energy and 47.34 minutes of TIEPI MV, the value of 3.52 GWh was estimated for non-distributed energy, which

[22] The RQS approved in 2021 establishes the concept of exceptional event as an incident with all of the following characteristics:

- Low probability of occurrence of the event or its consequences;
- The event causes a significant decrease in the quality of supply;
- It is not reasonable, in economic terms, that network operators, suppliers, suppliers of last resort or, in the case of the Autonomous Regions of the Azores (RAA) and Madeira (RAM), producers, avoid all of its consequences;
- The event and its consequences are not attributable to network operators, suppliers, suppliers of last resort or, in the case of RAA and RAM, producers.

An incident shall only be considered an exceptional event after approval by ERSE, following a request by network operators, suppliers or suppliers of last resort.

corresponds to an increase in the income of the main distribution system operator (DSO) of around 3.3 million euros in 2021. With regard to the value of the amount inherent in "component 2", based on the value of 482.54 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 zero euros in 2021.

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 due to a serious accident or another event of force majeure, the member of the Government responsible for energy may take any necessary transitional and temporary safeguard measures[23].

In 2021, there were no incidents that required the implementation of safeguard measures.

3.1.1.4 SPECIAL REGIME GENERATION

Special regime generation (SRG)[24] refers to the production of electricity through endogenous, renewable and non-renewable resources, combined heat and electricity (cogeneration) and distributed production technologies.

Order n.º 8810/2015 of 10 August, of the Directorate General for Energy and Geology (DGEG)[25], provides that under exceptional circumstances of operation of the national electricity system, particularly when there is congestion or when the safety of the generation-consumption balance and the continuity of electricity supply are at stake, the system manager will send reduction orders in order to control SRG facilities so they do not exceed a specific capacity value.

[23] Article 101 of Decree-Law no. 15/2022, of 14 January.

[24] Article 2(zz) of Decree-Law no. 76/2019 of 3 June, which changes the legal regime applicable to the activities of production, transportation, distribution and electricity supply and the organisation of electricity markets.

[25] Order no. 8810/2015 of 10 August, of DGEG, which lays down the necessary rules and procedures to establish conditions for the interruption of special regime generation, namely the order and sequence of the power reduction to be complied with by the special regime generation plants connected to the national electricity transmission or distribution networks.

In mainland Portugal, with the entry into force of Decree-Law no. 76/2019 of 3 June[26], the legal framework for SRG was revised, allowing them to operate under the guaranteed remuneration regime as well as the general remuneration regime.

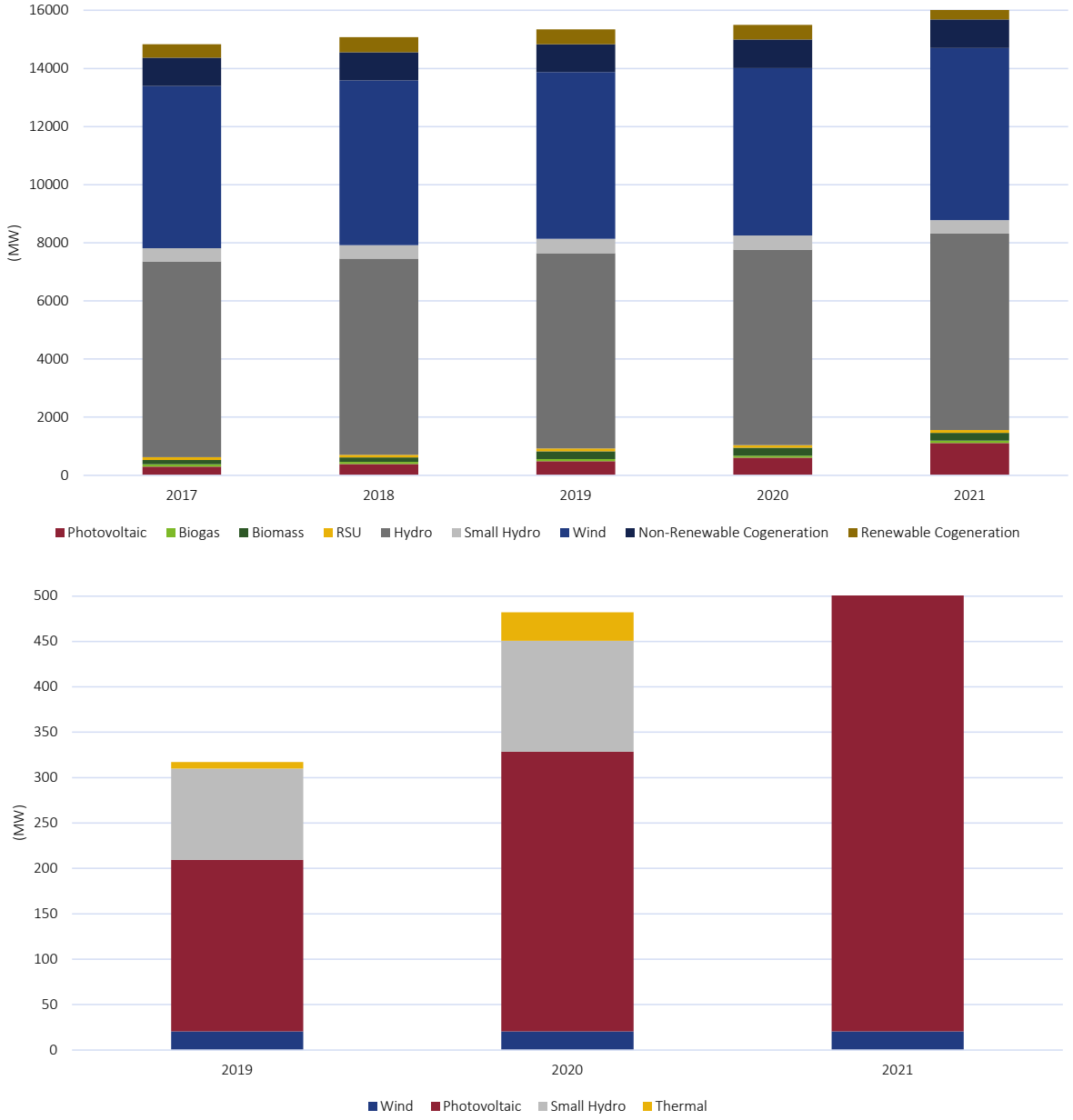
Under the guaranteed remuneration regime, producers sell their electricity at a guaranteed price over a given period (fixed or indexed to a benchmark, with or without setting minimum and/or maximum thresholds), while a competitive mechanism is used to define the guaranteed tariff. Under the general remuneration regime, producers sell their electricity at market price.

In 2021, the SRG installed capacity accounted for 85% of the total installed capacity of the Portuguese electricity system. From 2017 to 2021, this weight ranged between 75% and 85%.

Figure 3-4 shows the evolution of the SRG installed capacity between 2017 and 2021, as well as the SRG installed capacity under market regime between 2017 and 2027, excluding large hydro in order to ease the graphical interpretation. In 2021, it is worth noting that approximately 1835 MW of SRG installed capacity participates directly in the market, composed of mini-hydro (9%), photovoltaic (50%), wind (1%) and thermal (40%) technologies.

[26] That proceeded with the eleventh amendment of Decree-Law no. 172/2006, of 23 August, to develop the general bases of the organisation and functioning of the National Electricity System, changing the legal regime applicable to the activities of production, transportation, distribution and electricity supply and the organisation of electricity markets.

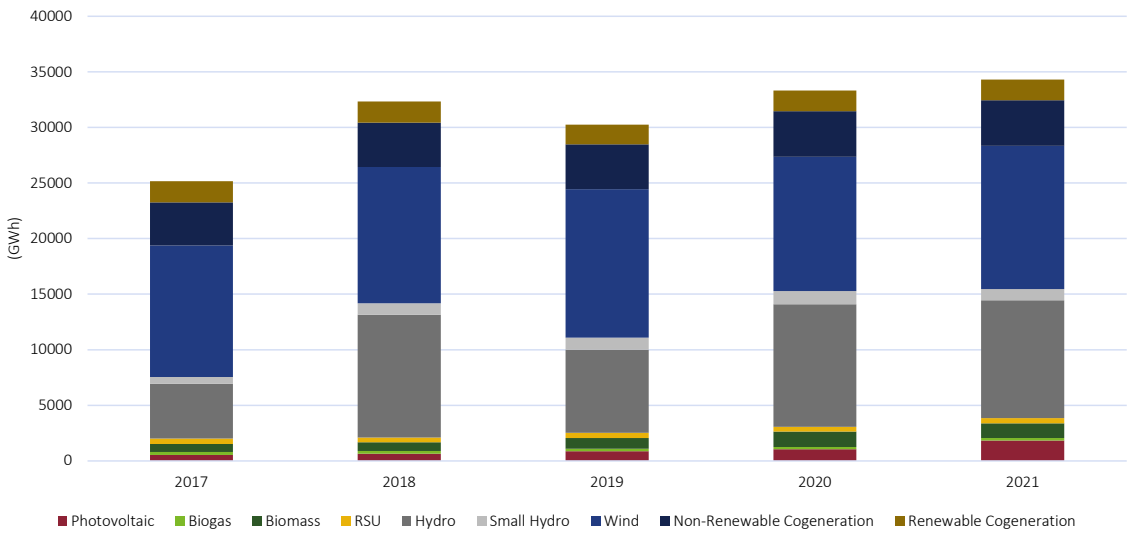
Figure 3-4 - SRG installed capacity, 2017 to 2021



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

Regarding the electricity produced in 2021, approximately 34 TWh came from SRG, representing 72% of the total electricity produced, a figure that ranged between 46% and 72% between 2017 and 2021. Figure 3-5 shows the evolution of SRG production between 2017 and 2021, broken down by technology.

Figure 3-5 – SRG electricity production, 2017 to 2021



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

The previous figures highlight the importance of SRG, and in particular renewable energy sources, in the energy mix of the Portuguese electricity system.

ELECTRICITY SELF-CONSUMPTION AND RENEWABLE ENERGY COMMUNITIES

Renewable electricity self-consumption had a recent boost in Portugal due to a change in the legal framework in 2019 (Decree-Law no. 162/2019). Simplification measures were implemented, raising the benefits for individual self-consumption, such as considering the energy netting in 15 minute periods and the dispensation from installing a meter for total energy generation below 4 kW of installed capacity, as well as the introduction of the concepts for collective self-consumption and the renewable energy communities (REC).

Since then, the number of self-consumers and the installed capacity of renewable self-consumption grew significantly. While self-consumers grew in number, mainly in the residential segment (representing 92% of the number of self-consumers), with installed capacities up to 4 kW, the installed capacity is mainly concentrated in the commercial segment, particularly in the medium voltage level. At the end of 2020, the number of self-consumers was around 27 000, reaching 79 000 by the end of 2021 (almost triple). The installed capacity grew from 264 MW in 2020 to 478 MW in the end of 2021 (81% more).

The development of collective self-consumption and of the renewable energy communities has been slower, due to the inherent complexity of the models. At the end of 2021, two collective self-consumption projects where registered. Some of the more advanced initiatives of REC, mainly those considering dynamic sharing of renewable energy, are being prepared in the form of pilot projects, as foreseen in the self-consumption code.

3.1.1.5 REGULATORY DEVELOPMENTS

Incentive for optimised management of non-terminated CAE

REN Trading, in its capacity as Commercial Agent, is responsible for managing and operating the placement of thermoelectric power plants of Pego (Tejo Energia - coal-fired power plant) and Tapada do Outeiro (Turbogás - natural gas combined cycle power plant) on the wholesale market, for which the long-term power purchase agreement (CAE) has not been terminated.

Within the regulatory framework that focuses on the activity of the Commercial Agent, the aforementioned implementation of the market placement of the energy produced by those two generators is subject to an economic incentive, aimed at promoting the optimized management of these two assets.

The validity period of the referred CAE is, at the beginning of 2021, relatively short, as the termination of Tejo Energia's CAE occurred at the end of November 2021 and Turbogás' CAE at the end of the first quarter of 2024.

Considering the proximity of the end of the CAEs in question, as well as the existence of an electricity market environment with substantial differences in relation to those that occurred at the time of the last revision of the incentive for the optimised management of the non-terminated CAEs, ERSE decided to submit for consultation by interested parties, addressed to REN Trading and the Tariff Board, a revision proposal aimed at promoting greater flexibility of the incentive, along with its better adaptation to the current context.

To implement the revision of the economic incentive, ERSE approved Directive no. 2/2021, on 19 January, with effect from 1 January 2021.

Definition of the parameter of charges supported by special regime producers within the scope of the transitional rule in Article 8 of Decree-Law no. 76/2019

Decree-Law no. 76/2019, of 3 June, which amended the legal requirements applicable to the exercise of the generation, transmission, distribution and supply of electricity and the organisation of the electricity markets, foresees a transitory rule in article 8, in force while the market facilitator license is not granted. The rule foresees the possibility of the supplier of last resort (SOLR) acting as a substitute for that agent. In this framework, it is established that ERSE defines the portion of charges for the market representation of the producer in the expression for the calculation of the remuneration of the electricity supplied to the Public Service Electricity Network (RESP).

In order for the application of the transitional provisions set out in Decree-Law no. 76/2019, of 3 June, to proceed properly, ERSE approved Directive no. 5/2021, of 24 February, in which defined the portion of the charges to be supported by special regime producers whose authorised capacity injection into the RESP does not exceed the threshold defined in paragraph 1 of Article 8 of Decree-Law no. 76/2019, of 3 June, namely the programming deviations, the transmission use of network tariff to be applied to the producers, when applicable, and other charges.

For the calculation of the share of charges, a binomial distribution was defined through a fixed component covering general operating charges, and a second variable component covering programming deviations and other charges, if any, based on settlement by the Global Technical Operator, and the Transmission Use of Network tariff to be applied to producers, based on settlement by the network operator. This solution makes it possible to immunise the programming deviations and the Transmission Use of Network tariff to be applied to generators in terms of tariff repercussions, with the establishment of a reference value for the fixed component.

Pilot project on participation of demand response in the ancillary services market

Extension of Operation

During 2021, the pilot project for the participation of consumption in the ancillary services market remained in operation. Through Directive no. 6/2020, of 20 April, ERSE approved that, as of 2 April 2020, the rules established by Directive no. 4/2019, of 15 January, on the participation of consumption in the

ancillary services market remain in play and, if the parties so wish, the respective contracts. This provision is transitory and is in force until the current regulations are amended.

Conclusion of the public consultation regarding the revision of the Quality of Service Code for the Electricity and Gas Sectors

The most recent revision of the RQS, published in 2017, maintained the concept and definition of the quality of service zones in force, with regard to the electricity sector, since the first publication of this regulation, in 2004, in mainland Portugal. At the time, the need to review this topic was already identified, which became opportune, given the evolution that has been taking place in terms of geo-referencing in the computer systems of the network operators. The regulatory alteration of these issues was carried out through public consultation no. 94, and the new RQS was published on 12 May 2021.

The requirement imposed on network operators regarding continuity of supply in the electricity sector was changed, becoming greater, with the publication of the first RQS operated in 2013. The studies developed in the meantime, in collaboration with the network operators, showed that it is possible to increase the quality of service provided to customers by increasing the level of requirements in the general and individual standards of continuity of supply in the electricity sector. The new RQS, published in the meantime, accommodated new values for continuity of supply standards.

The publication of Decree-Law 62/2020, of 28 August, brought changes to the organization of the national gas system that require the RQS to be adapted, highlighting the possibility of injection into the grid of renewable and low carbon content gases.

Pilot-project on the use of technical quality of service data collected by smart metering equipment

Code no. 610/2019, of 2 August, approved the ERSE Code on Smart Grid Services which establishes the framework applicable to the provision of services within the scope of intelligent electricity distribution networks (smart grids) as regards network operators and suppliers.

The RSRI covers matters also addressed in ERSE's Commercial Relations Code (RRC), in the RQS and in ERSE's Guide for Measurement, Reading and Availability of Data.

According to Article 22 of the RSRI, low voltage network operators must propose to ERSE a pilot-project on the availability and use of technical data recorded by smart metering equipment (SME). E-Redes -

Distribuição de Eletricidade, S.A.[27] submitted to ERSE a proposal for the implementation of a pilot project concerning the use of quality of service data recorded by SME, and ERSE approved the pilot project on 28 April 2020.

The pilot project, ended on 23 November 2021 and involved around 21 000 low voltage customers fed by the Marinha Grande substation. These low voltage customers helped the network operator not only to assess the type of technical information collected by the SMEs, but also to improve the calculation of individual continuity of supply indicators for this voltage level (number of interruptions and duration of interruptions).

A benefit that was demonstrated through the implementation of this pilot project is the contribution of the information extracted from the SMEs to support the response to complaints about the voltage of the network outside the standard value range, making it possible to improve the efficiency of the process of screening and assess complaints about the power quality.

Electricity self-consumption and renewable energy communities

In 2021, ERSE reformulated the Electricity Self-consumption Code, publishing the Code no. 373/2021, of 5 May. The regulatory revision clarified and developed the concepts of self-consumption as regards metering and commercial relations and also set the framework for electricity storage and its participation in self-consumption, as established in the law.

The new code also considered the possibility to implement pilot projects. This framework for pilot projects allowed the temporary derogation of specific rules, diverging or in complement of the Electricity Self-consumption Code. The purpose is to test new business models and new forms of organisation for self-consumption highlighting the use of dynamic sharing of the generated energy[28].

[27] New name of EDP Distribuição - Energia, S.A., as imposed by regulation for image differentiation.

[28] In the beginning of 2022, on 14 January, the legal framework for electricity self-consumption was changed by the Decree-Law no. 15/2022, which considered the possibility of establishing dynamic systems for energy sharing. Pilot projects represent an initial deployment of the new rules, before their transposition for the regulation framework. Thus, we plan to test real models of deployment to guide the future definition of the applicable regulations.

Pilot projects for electricity self-consumption and renewable energy communities

Supported by the self-consumption code, which has a specific framework for pilot projects, several proposals for pilot projects of REC and collective self-consumption were submitted to ERSE.

The pilot projects aim for the technical support of ERSE in its development and interpretation of the regulatory framework, and to test advanced ways of energy sharing between self-consumers, defining day-ahead sharing coefficients after knowing the generation and load diagrams of each participant. These advanced ways of sharing allow optimisation of energy sharing for the objective defined in each situation (minimising the surplus injected in the grid, minimising the use of the public networks and tariffs payment, implementation of models for peer-to-peer, etc.).

ERSE followed the projects and ensured the technical support to the promoters of pilot projects and other stakeholders. In 2022, some of the pilot projects should begin the execution phase.

3.1.2 NETWORK TARIFFS FOR CONNECTION AND ACCESS

REGULATORY FRAMEWORK

ERSE is responsible, namely, for the approval of the methodology used to calculate tariffs and prices for the electricity sector, the methodologies for regulating allowed revenues, as well as for the approval of the network access tariffs for the transmission and distribution networks and the transitional tariffs (applied to the supplier of last resort)[29].

The methodology used to calculate tariffs and the regulation methodologies are set in ERSE's Tariffs Code (RT), which is elaborated and approved by ERSE, after a public consultation process and the mandatory non-binding opinions by ERSE's consultative bodies, namely the Tariff Council. The tariff fixing process, including its timeframe, is also defined in the RT.

The tariffs set for 2021, including the network access tariffs for the electricity networks, apply the rules set out in the current RT, approved by ERSE Regulation no. 619/2017, of 18 December, and changed by ERSE Regulation no. 76/2019, of 18 January, and by ERSE Regulation no. 486/2020, of 20 May.

[29] Established in the ERSE Statutes, approved by the Decree-Law no. 97/2002, of 12 April, in its current wording.

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 of the Public Service Electricity Network (RESP). Generally speaking[30], these tariffs are paid by suppliers on behalf of their customers and passed on to the final price.

The revenues generated from regulated activities are recovered through specific tariffs, each with their own tariff structure. They are given a set of billing variables. The following tariffs are approved by ERSE: Global Use of the System, Use of the Transmission Network to be applied to generators entering RNT and the RND, Use of the Transmission Network at EHV and HV, Use of the Distribution Networks at HV, MV and LV and the Switching Logistics Operator. 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, as well as (ii) of 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.

This calculation methodology allows for a detailed knowledge of the various tariff components by activity or service. Therefore, each customer may 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 3-4 presents the electricity network access tariffs and their billing variables.

[30] 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.

Table 3-4 – Electricity network access tariffs structure[31]

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	●	●	●	●	●

Under the terms of ERSE's Electric Mobility Code, in place in 2021, the points that integrate the electric mobility network which are connected to the RESP pay the electricity network access tariffs applicable to electric mobility. The network access tariffs for electric mobility apply to the electric vehicle users and are formed by an energy price per time period in euros per kWh[32].

CONTESTATION OF TARIFF DECISIONS

As regards appeals against a decision or methodology used by the regulatory authority, as provided for in Article 59(1) of Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019, several administrative actions were filed in 2021 by energy producers against ERSE.

Several energy producers who adhered to the alternative remuneration scheme provided for in Decree-Law n.º 35/2013, of 28 February, have filed more than 5 dozen lawsuits against ERSE, the State and/or SU Eletricidade, S.A. (SU Eletricidade), which are underway in 13 different courts, based on an interpretation of this law which conflicts with Order no. 6304/2021, namely i) an interpretation of this law that conflicts with Order n.º 6304/2021, of 16 June, of the Deputy Secretary of State and of Energy, and ii) its reflection

[31] The table does not include the Use of the Transmission Network tariff to be applied to generators by entering the RNT and the RND, as we consider that this tariff does not integrate the network access tariffs, as users are directly responsible for its payment.

[32] For more information regarding electric mobility, see point 6.4 in this document.

in Instruction n.º 11/2021 of ERSE that makes it operational, as well as iii) the communications of SU Eletricidade relating to the reconciliation values established under the terms of the ERSE Instruction.

The producers argue for an interpretation of Article 5 of Decree-Law n.º 35/2013 which guarantees them a remuneration for the electricity produced which is higher than that resulting from the contested Order and, also, from the ERSE Instruction which enforces it, from the moment of its application. The arguments put forward by the producers have a common core, around the "Agreement in Principle" that would have been reached on 27/08/2012 within the scope of the financial assistance plan to Portugal, between the member of the Government in the area of energy and APREN - Portuguese Renewable Energy Association, from content of Decree-Law n.º 35/2013, the practice allegedly followed by SU Eletricidade and the principle of the protection of confidence. In some cases, with different intensities and developments, alleged defects for lack of competence, lack of qualification and omission of formalities for the issuing of the contested Order are invoked, as well as the alleged violation of other administrative and constitutional principles.

Despite having been consulted at the end of the legislative process on Decree-Law n.º 35/2013, ERSE was unaware of the negotiations which preceded it and which led to the invoked "Agreement in Principle". However, ERSE pointed out in the various administrative actions that, on the one hand, a simple comparison of the texts allows the reader to understand that the legal diploma did not translate verbatim the document dated 27/08/2012 submitted by the producers and, on the other hand, that not all producers, in the respective actions brought, presented the uniform version as to the interpretation of the alleged proposal of 27/08/2012 and the agreement reached. ERSE also pointed out that the member of the Government for the energy sector in office on the date of the negotiations presented, before the Parliamentary Inquiry Committee, an interpretation of the agreement reached which supports the solution of the contested Order and disallows any of the versions of the producers, both for the period from 2013 to 2020 and thereafter.

ERSE argued that, contrary to what was alleged by the producers, the putative formal defects are not applicable, nor is there any violation of any administrative or constitutional rule regarding the Order of the Deputy Secretary of State for Energy, the ERSE Instruction which makes it operational, or the subsequent billing of SU Eletricidade.

NETWORK ACCESS TARIFF PRICES

Taking into account the demand forecasted for 2021, the network access tariffs for 2021[33] corresponded to a tariff increase of 4.4%, as presented in the following table.

Table 3-5 – 2021 network access tariffs

	2020 Tariffs (average prices) €/kWh*	2021 Tariffs (average prices) €/kWh	Change
Network Access Tariffs	**0.06890**	**0.07192**	**4.4%**
Access to EHV Networks	0.02264	0.02264	0.0%
Access to HV Networks	0.02828	0.02828	0.0%
Access to MV Networks	0.04798	0.04799	0.0%
Access to SpLV Networks	0.08219	0.08726	6.2%
Access to StLV Networks	0.10505	0.11168	6.3%

* Application of 2020 tariffs to the demand forecasted for 2021.

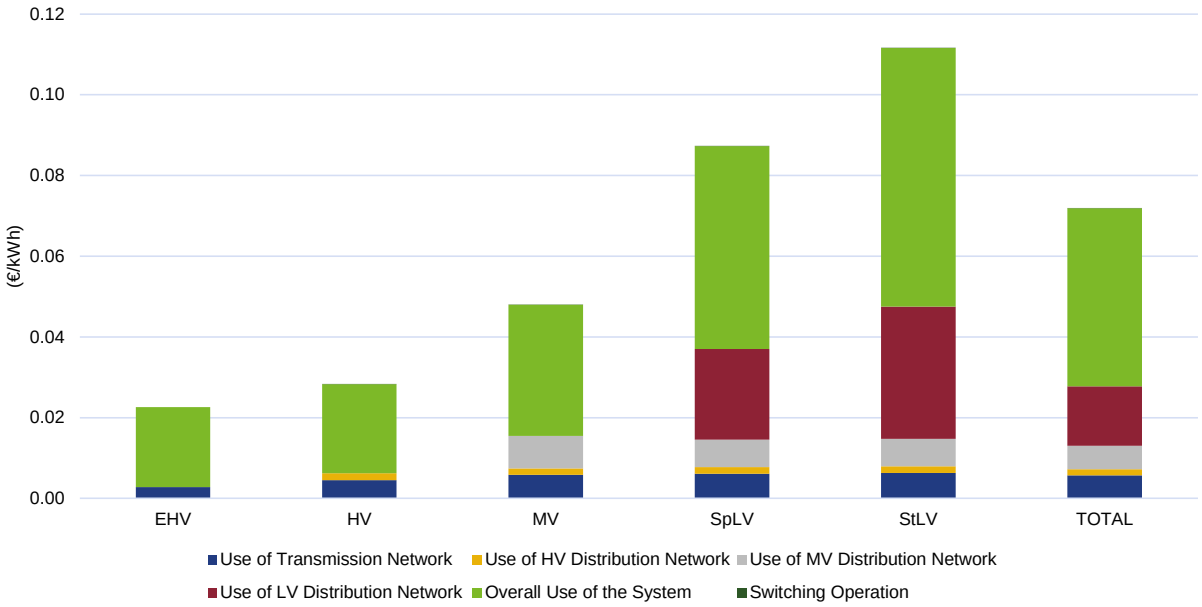
Source: ERSE Data

Figure 3-6 below shows the breakdown of average prices for the 2021 electricity network access tariffs per regulated activity and voltage level, while Figure 3-7 shows the corresponding structure of average prices per regulated activity and voltage level[34].

[33] Directive no. 1/2021, of 8 January, which approves the tariffs and prices for electricity and other services in 2021 (in Portuguese).

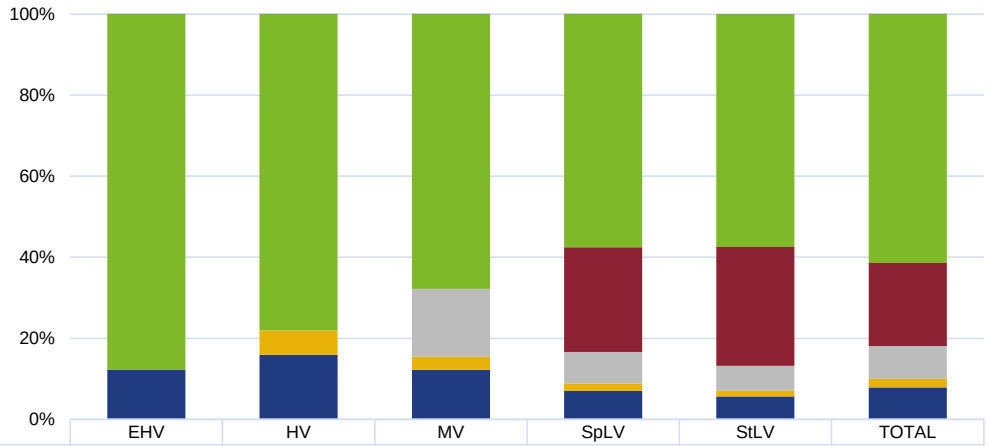
[34] For EHV, the value of the OLMC tariff is not visible in the graphic, although it is applicable.

Figure 3-6 – Breakdown per activity of the average price of network access tariffs in 2021



Source: ERSE Data

Figure 3-7 – Structure of the average price of network access tariffs by regulated activity per voltage level in 2021



	EHV	HV	MV	SpLV	StLV	TOTAL
Switching Operation	0.00%	0.00%	0.00%	0.00%	0.06%	0.04%
Overall Use of the System	87.7%	78.1%	67.8%	57.6%	57.4%	61.4%
Use of LV Distribution Network				25.8%	29.3%	20.5%
Use of MV Distribution Network			16.8%	7.8%	6.1%	8.1%
Use of HV Distribution Network		6.0%	3.2%	1.9%	1.5%	2.1%
Use of Transmission Network	12.3%	15.9%	12.2%	7.0%	5.6%	7.9%

Source: ERSE Data

REGULATORY DEVELOPMENTS

PILOT PROJECTS FOR DYNAMIC TARIFFS LOW VOLTAGE

The Clean Energy Package, the European legal framework for electricity, has established a more relevant role for demand flexibility, creating the figures of active customers, communities of citizens for energy and aggregators, among others. The importance of demand flexibility is also present in the right to a dynamic priced electricity contract.

In this context, ERSE public consultation no. 101 presented a proposal to promote a pilot project for the introduction of dynamic prices in the LV network access tariff, considering two modalities. The first alternative, called the Indexed Network Access tariff (Indexed TAR), could adopt a critical peak pricing structure and would consist of defining critical periods in an indexed manner from MIBEL information. The second alternative, called the Seasonal Network Access tariff (Seasonal TAR), would be a pilot project in line with the proposed new option for in EHV, HV and MV Networks Access tariff and would be to design a tariff option in SpLV and StLV networks access, with greater seasonal differentiation, both in time and locational terms.

The participants in the consultation expressed a favourable position on the merits of testing new tariff structures through pilot projects, although a few indicated a clear preference for one of the two modalities presented in the public consultation.

Thus, ERSE will carry out a pilot project over the next regulatory period, consulting stakeholders and finalising it in 2024, in order to include any changes to the regulatory framework before the start of the next regulatory period.

REGULATORY METHODOLOGIES FOR DETERMINING ALLOWED REVENUES

The year 2021 was the last year of the regulatory period which started in 2018. Initially, the regulatory period was supposed to end in 2020. However, due to the pandemic of COVID-19, the regulatory period was extended until 2021. The regulatory models applied for allowed revenues during the period are described below, per type of operator and the supplier of last resort:

- For mainland Portugal:
    - Transmission system operator (TSO) – for transmission activity: model based on economic incentives: (i) application of a price cap[35] methodology with efficiency targets for operating costs (OPEX[36]); (ii) incentive for efficient investment in the transmission network through the use of reference prices in valuing new equipment to be incorporated into the network, whose greater risk is offset by a small risk premium; (iii) incentive for economic rationalisation of investment costs. In the Global Technical Management System activity, the revenues are set through a revenue cap methodology with the separation of controllable and non-controllable costs for the application of efficiency targets[37].
    - Distribution network operator (DSO) – Price cap[38] methodology applied to unit operating costs (OPEX) and accepted costs[39] on an annual basis in the case of investment costs (CAPEX)[40], taking into account the investment plans proposed by the companies, regarding the distribution of electricity at HV/MV. Application of a price cap methodology to TOTEX[41] in the distribution of electricity at LV. Other incentives also apply: (i) incentive for investment in smart networks[42]; (ii) incentive to improve service continuity; (iii) incentive to reduce losses; and (iv) incentive on the integration of LV installations into smart grids.
    - Switching operator: In 2018, the supplier switching activity was separated[43] and subjected to a revenue cap methodology for OPEX[44] and accepted costs for CAPEX.

[35] The cost drivers that determine the evolution of the revenue recoverable by the application of the transmission network use tariff are not very volatile, bringing this methodology closer to *revenue cap*. The drivers are the length (km) of the network lines and the number of panels in substations. The annual efficiency factor was set at 1.5%.

[36] Operational expenditure.

[37] The annual efficiency factor is 1.5%.

[38] Cost drivers in HV/MV are distributed energy and network length (km); in LV, are the installed power, the network extension (km) and the number of customers. The annual efficiency factor is 2%, plus inflation.

[39] Net asset remuneration and amortisation.

[40] Capital Expenditure

[41] Total Expenditure

[42] In the 2015-2017 regulation period, this incentive started being calculated based on real and audited values, a process that will last for 6 years.

[43] Until 2017, the supplier switching activity was performed by the HV/MV distribution system operator.

[44] For the period 2018-2021, the efficiency factor was set at 1.5%.

- Suppliers of Last Resort: Price cap methodology[45] supplemented by a component for non-controllable costs.

- For the Autonomous Regions of the Azores and Madeira, regulation by economic incentives is applied to companies with electricity transmission and distribution concessions: (i) regulation of the activity of electricity acquisition and system management based on a revenue cap methodology46; (ii) regulation of the activities of electricity distribution and supply through a methodology of calculation of allowed revenues by price cap47 applied to OPEX. Accepted costs on an annual basis in the case of CAPEX in order to calculate allowed revenues; (iii) definition of reference costs for fuels (fuel oil, diesel and natural gas) consumed in the generation of electricity, as well as for costs arising from the unloading and storage of those fuels48; (iv) incentive for the integration of LV facilities in smart grids.

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 costs[49], a partial indexation methodology is applied to the yields of treasury bonds (OT), which allows to reflect the evolution of the economic-financial situation and, thus, to compensate for the risks of own and other capital.

The allowed revenues for transmission and distribution network operators of mainland Portugal for the overall management of the system, the sale and purchase of electricity from commercial agents and for the sale and purchase of the access to the transmission network include costs arising essentially from legislative decisions, the so-called General Economic Interest Costs (CIEGs). The most significant CIEGs, in terms of value or of their impact on the functioning of the market, are related to electricity generation.

[45] Cost driver is the number of customers. The annual efficiency factor is 1.5%.

[46] Efficiency factor set at 1.5%.

[47] The cost drivers in the distribution activity in both Autonomous Regions are distributed power and the number of customers. In the trading activity, the cost driver is the number of customers. In both Autonomous Regions, the efficiency targets applied to each of the activities vary between 3% for distribution and 2.5% for trading, respectively.

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

[49] Rates of return on assets for 2021 in mainland Portugal and autonomous regions – transmission: 4.60%; distribution: 4.85%.

Market liberalisation led to the need to anticipate the termination of the long-term Power Purchase Agreements (CAEs). Two of these contracts were maintained, with the energy produced by these two power plants being managed by a supply company, but fully regulated (Commercial Agent, under the terms of the RRC). The revenues of this company depend on incentives defined by ERSE. In general, these incentives directly relate the revenues of the supply company to the operating margin obtained with the sale of the energy of the plants with PPA in the market. One of these contracts ended in 2021, and there is now only one PPA, whose extra cost effect will end in 2024 with the end of that contract.

The remaining power purchase agreements were terminated at the time of liberalisation 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 CAEs. This regime, as indicated in last year's report, 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 the remuneration of energy generated by renewable resources or cogeneration (SRG, except for large hydropower plants), which are determined administratively; with the concession of rents paid by the distribution network operator in LV to municipalities; and 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 2021, no significant changes were registered regarding the nature of the portions included in CIEG.

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 the electricity Commercial Relations Code (RRC), approved by ERSE, having not been subject to changes during 2021.

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 electricity users through network connection charges (according to the rules approved by ERSE) and tariffs for use of the network, which form part of the electricity bill (the difference between the investment cost and the cost directly imputed 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 2021, no significant changes were made to the management of the interconnections between Portugal and Spain, namely regarding the model for daily and intraday capacity allocation, which was assigned exclusively to the MIBEL daily and intraday market, beyond the explicit use of the capacity through financial mechanisms to cover the risk for the interconnection use. Congestion is resolved through the application of a *market-splitting* mechanism[50].

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) n.º 714/2009 of the European Parliament and of the Council[51]; ERSE Code on Access to Networks and Interconnections[52]; ERSE Manual of Procedures for the Joint Management Mechanism of

[50] 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.

[51] 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

[52] 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.

the Portugal-Spain Interconnection[53]; and ERSE Manual of Procedures for Global Technical Management System of the electricity sector[54].

In 2021, work continued on implementation of the terms and conditions or methodologies foreseen in:

- 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 n.º 6/2016, of 17th November, namely the Capacity Calculation Region South-west Europe (CCR SWE) that includes the interconnections of Portugal, Spain and France;
- Commission 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.

In this context, the TSO's request for derogation from the application, in 2022, of Article 16(8) of Regulation (EU) 2019/943 on the minimum levels of interconnection capacity available for cross-zonal trade was approved.

REVENUE FROM CONGESTION ON INTERCONNECTIONS

According to European legislation and regulation, congestion revenue may only be used to: 1) offset costs arising from coordinated balancing actions,[55] with a view to ensure the interconnection capacity contracted

[53] 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 ammendments introduced by ERSE Directive no. 1/2019, published in Diário da República, 2ª série of 7 January.

[54] Manual of Procedures for Global Technical System Management of the Electricity System 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 Directives no. 14/2018, published in Diário da República, 2ª série, of 10 August, no. 9/2020, published in Diário da República, 2ª série, of 29 May, no. 4/2021, published in Diário da República, 2ª série, of 25 January, no. 13/2021, published in Diário da República, 2ª série, of 19 July and no. 16/2021, published in Diário da República, 2ª série, of 18 November.

[55] According to ERSE's Manual of Procedures for Global Technical System Management of the Electrical System, coordinated balancing actions apply when interconnections face real-time congestion, and consist of an opposite physical energy transaction traded between system operators, for the same amount but opposite flow direction of the congestion, in order to clear scheduled commercial transactions.

in the daily and intraday market; 2) make investments to strengthen the interconnection capacity; or 3) reduce the transmission network tariff, if the revenue is not used for the two aforementioned purposes.

In 2021, 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 4.15 million euros, a value above the amount registered in 2020 (2.49 million euros).

Table 3-6 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 3-6 - Monthly evolution of congestion revenue, 2021

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	59	8%	60.69	60.17	0.53	645 328	273 528	830
February	36	5%	28.19	28.49	-0.30	95 105	819 026	423
March	21	3%	45.39	45.45	-0.06	322 559	481 092	162
April	28	4%	64.93	65.02	-0.08	543 659	348 835	388
May	21	3%	67.12	67.12	0.00	919 817	143 863	183
June	13	2%	83.29	83.30	-0.01	464 526	251 312	59
July	9	1%	92.60	92.42	0.18	688 333	167 093	445
August	2	0%	105.99	105.94	0.04	956 008	60 742	86
September	16	2%	156.53	156.14	0.38	644 513	121 163	927
October	2	0%	199.92	199.90	0.02	878 639	150 033	74
November	15	2%	193.50	193.43	0.07	652 390	232 059	369
December	8	1%	239.27	239.16	0.10	553 471	333 459	208
								4 153

Source: OMIE[56] data

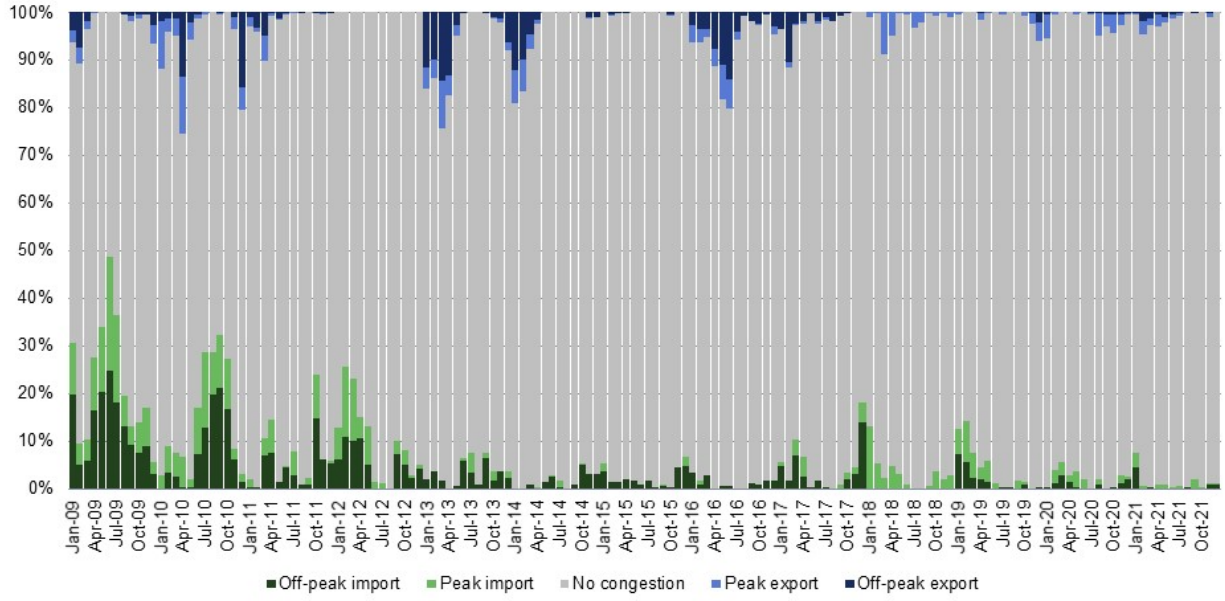
[56] Operador del Mercado Ibérico de Energía – Spanish hub

When comparing the total number of congestion hours, the variation was from 358 hours in 2020 to 230 hours in 2021. This total includes congestion in both directions of the interconnection and reflects a strong integration of the markets.

In terms of the price differential, in 2021, there was a positive average spread of 0.07 €/MWh, in the import direction, a value above the figures for 2020 (import spread of 0.03 €/MWh), maintaining reasonably low values throughout the year. In some months, there was an inversion of the direction of congestion.

The figure below shows the use of the available capacity in both directions of the Portugal-Spain interconnection, from 2009 to 2021, and shows the overall decrease in the number of hours of congestion in both directions.

Figure 3-8 – Usage of the Portugal-Spain interconnection capacity, 2009 to 2021



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.

On 13 May 2014, the coupling of the Iberian market with the *North-West* Europe (NWE) region, which includes the markets of France, Belgium, Netherlands, Germany, Luxembourg, United Kingdom, Norway, Denmark, Sweden and Finland), became a reality, and has been successful since then.

With Portugal being geographically located on the Iberian Peninsula, 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, 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.

FORWARD TRADING OF THE COMMERCIAL CAPACITY IN 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 2021. 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 2020 and November 2021, the financial transmission rights (FTR) auctions of commercial capacity in the Portugal-Spain interconnection with 2021 delivery took place at the joint allocation platform with 2021 delivery, as shown by Table 3-7.

Table 3-7 – Financial transmission rights auctions of commercial capacity in the Portugal-Spain interconnection with 2021 delivery

Contract	Maturity	Date	Premium (€/MWh)	Volume (MW)	Participants	Participants with allocated capacity
ES-PT YR	Yearly	09/12/20	0.10	340	20	13
PT-ES YR	Yearly	09/12/20	0.08	350	20	13
ES-PT Q1	Quarterly	15/12/20	0.09	260	10	8
PT-ES Q1	Quarterly	15/12/20	0.05	490	9	8
ES-PT M1	Monthly	22/12/20	0.08	300	20	13
PT-ES M1	Monthly	22/12/20	0.04	1140	20	18
ES-PT M2	Monthly	26/01/21	0.11	257	21	15
PT-ES M2	Monthly	26/01/21	0.10	239	19	6
ES-PT M3	Monthly	23/02/21	0.00	0	1	0
PT-ES M3	Monthly	23/02/21	0.13	510	24	12
ES-PT Q2	Quarterly	11/03/21	0.07	270	7	6
PT-ES Q2	Quarterly	11/03/21	0.06	120	6	4
ES-PT M4	Monthly	24/03/21	0.10	220	23	15
PT-ES M4	Monthly	24/03/21	0.10	490	23	13
ES-PT M5	Monthly	23/04/21	0.13	70	23	9
PT-ES M5	Monthly	23/04/21	0.08	630	23	15
ES-PT M6	Monthly	26/05/21	0.06	430	21	17
PT-ES M6	Monthly	26/05/21	0.15	399	22	7
ES-PT Q3	Quarterly	10/06/21	0.03	490	7	7
PT-ES Q3	Quarterly	10/06/21	0.02	338	6	6
ES-PT M7	Monthly	24/06/21	0.03	330	20	16
PT-ES M7	Monthly	24/06/21	0.21	160	21	3
ES-PT M8	Monthly	22/07/21	0.07	440	20	13
PT-ES M8	Monthly	22/07/21	0.19	190	19	4
ES-PT M9	Monthly	24/08/21	0.09	520	24	12
PT-ES M9	Monthly	24/08/21	0.07	350	23	12
ES-PT Q4	Quarterly	10/09/21	0.07	360	7	5
PT-ES Q4	Quarterly	10/09/21	0.05	339	6	4
ES-PT M10	Monthly	22/09/21	0.21	589	25	12
PT-ES M10	Monthly	22/09/21	0.16	490	22	9
ES-PT M11	Monthly	22/10/21	0.23	70	25	8
PT-ES M11	Monthly	22/10/21	0.09	578	23	13
ES-PT M12	Monthly	24/11/21	0.11	430	25	11
PT-ES M12	Monthly	24/11/21	0.14	220	24	8

Source: JAO data, ERSE elaboration

Table 3-8 presents the settlement of annual FTR auctions with 2021 delivery in the Portugal-Spain interconnection.

Table 3-8 – Annual FTR settlement with 2021 delivery

Annual FTR settlement	GLOBAL	Pr ES > Pr PT	Pr PT > Pr ES
		FTR E-P	FTR P-E
Capacity (MW)	1 123 + 991	1123	991
Energy (MWh)	9 834 933 + 8 678 969	9 834 933	8 678 969
Premium (€/MWh)	----	0.08	0.09
Spread (€/MWh)	----	0.06	0.14
Spot congestion (euros)	4 153 280	1 218 431	2 934 849
FTR risk (euros)	1 877 881	614 434	1 263 447
FTR actions premium (euros)	1 528 373	769 661	758 711
Net FTR auctions (euros)	-349 508	155 228	-504 736
Spot congestion + Net FTR (euros)	3 803 772	1 373 659	2 430 113

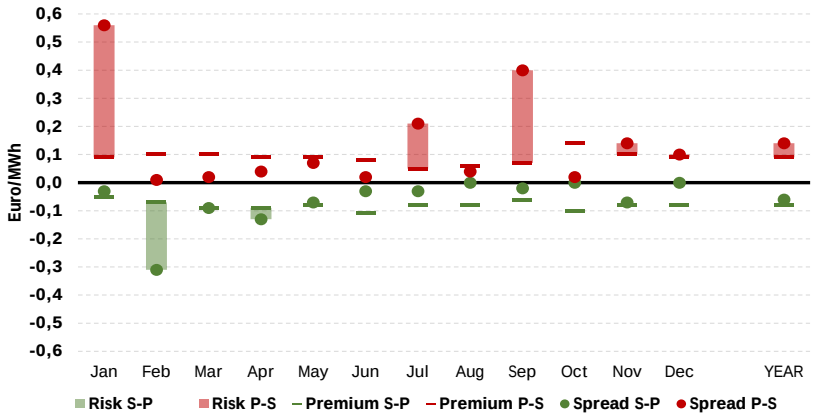
FTR - Financial Transmission Rights

Source: JAO, REN and OMIE data, ERSE elaboration

It can be seen that during 2021, in the Portugal to Spain direction, there was a risk premium[57] of 0.08 €/MWh and a spread[58] of 0.06 €/Wh. In the Spain to Portugal direction, there was a risk premium of 0.09 €/MWh and a spread of 0.14 €/MWh.

Figure 3-9 shows the evolution of spreads and risk premiums in 2021.

Figure 3-9 – Evolution of spreads and risk premiums in 2021



Source: JAO, REN and OMIE data, ERSE elaboration

[57] The risk premium is defined as the premium weighted by placed product in the financial transmission rights auctions of commercial capacity in the Portugal-Spain interconnection with 2021 delivery.

[58] 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).

Considering these results, the FTR capacity auctions on the Portugal-Spain interconnection with 2021 delivery yielded approximately 350 000 euros in a net loss for the system.

APPROVAL OF THE DEROGATION REQUEST FOR THE APPLICATION IN 2022 OF ARTICLE 16(8) OF REGULATION (EU) 2019/943 ON THE MINIMUM CAPACITY LEVELS AVAILABLE FOR INTERZONAL TRADE

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

"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 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.

REN, in its capacity as Portuguese TSO, sent to ERSE, in 9 November 2021, the "REN 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 2021". REN requested a one-year derogation, for compliance in 2022, on the obligation of network operators from 1 January 2020, to make available at least 70% of the transport capacity for interzonal trade, respecting the operational safety limits after deduction of emergencies.

After a technical evaluation of the request for a derogation sent by REN, ERSE approved the derogation requested by REN regarding application in 2022 of the provisions of Article 16(8) of Regulation (EU) 2019/943.

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 (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 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 3-9 shows the energy values and weighted average process in 2021 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 3-9 – Statistics on TERRE, 2021

	Up	Down
Energy (GWh)	403	424
Average Price (€/MWh)	143.23	79.85
PT Bids (GWh)	9 656	9 331
PT Activated Bids (GWh)	242	312
Average PT Price (€/MWh)	121.90	97.24
Interconection (GWh)	572	527

Source: REN data

We recall that on 16 December 2020, REN started using the IGCC platform from the imbalance netting process.

Other European projects in which REN is participating and which will also give rise to European platforms are PICASSO, for aFRR, and MARI for mFRR[59]. Participation in these platforms is mandatory. In the case of TERRE, mentioned above, the obligation is limited to Member States whose TSOs use RR, previously known as regulation reserve.

The platforms for the PICASSO (aFRR) and MARI (mFRR) projects are expected to start operating in 2022, although in the beginning with a reduced number of TSOs.

In 2021, following the joint work with regulators and TSOs that began in 2019, ACER monitored various activities such as the implementation work of the MARI and PICASSO platforms as well as the functioning of the TERRE and IGCC platforms and the implementation of the methodologies approved in accordance with the EB GL such as "Imbalance settlement harmonisation" (article 52(2) of the EB GL), "Standard Balancing Capacity Products" (article 25 of the EB GL), "Methodology for Co-optimized allocation process of Cross -Zonal Capacity" (Article 40 of the EB GL). The definition of the methodology "Harmonization of Cross-Zonal Capacity Allocation methodologies" and "RCC facilitation for Balancing Capacity procurement" also began.

[59] IGCC: International Grid Control Cooperation; PICASSO: Platform for the International Coordination of the Automatic frequency restoration process and Stable System Operation; MARI: Manually Activated Reserves Initiative; TERRE: Trans European Replacement Reserves Exchange

NOMINATED ELECTRICITY MARKET OPERATOR

Article 4 of the CACM GL provides that, four months after its entry into force, each Member State should have designated one or more Nominated Electricity Market Operator(s) (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[60] 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 2021, 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 No. 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 intraday continuous electricity market trading in the following countries: Germany, Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Slovenia, Spain, Estonia, Finland, France, Hungary, Italy, Latvia, Lithuania, Luxembourg, Norway, the Netherlands, Poland, Portugal, Romania and Sweden. Further expansion of the XBID project is planned in the coming years.

The XBID platform was established as a Single Intraday Coupling (SIDC), 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 cross-zonal transmission available capacity for the trade. The solution aims to increase the overall efficiency of continuous intraday trading.

[60] Operador del Mercado Ibérico de Energía – Spanish hub

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

Under Commission Regulation (EU) 2015/1222, ACER approved Decision 04-2018, related to the continuous intraday market timeframes, which established the gate opening time at 15:00 CET and the gate closure time at 60 minutes before energy deliveries at the relevant time according to continuous intraday market negotiation.

Seeking to implement 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 15:00 CET continuous intraday market gate opening time. This consultation lead to the decision to keep the six intraday auctions with some timetable adaptations. To implement the continuous intraday market 15:00 CET gate opening time, ERSE approved an alert proposed by the Portuguese TSO, aiming to change the timetables considered by the Manual of Procedures for the Global Management of the Electricity System.

In 2021, there were no new developments related to the XBID project.

3.1.4 INVESTMENTS IN ELECTRICITY NETWORKS

National development and investment plan for the electricity transmission network

REN, in its role as TSO, submitted to ERSE a proposal for the National Development and Investment Plan for the Electricity Transmission Network concerning the 2022-2031 period (PDIRT-E 2021). The regulator is responsible for organising a public consultation on the proposal, pursuant to the terms of Article 36-A (2) of Decree-Law no. 76/2019 of 3 July[61].

Thus, within the scope of its competences, ERSE submitted for public consultation the PDIRT-E 2021 proposal, as prepared by the TSO, from 3 May to 16 June 2021[62].

Taking into account the results of that consultation, as well as the comments obtained following the consultation of ERSE's Advisory and Tariff Councils, ERSE analysed the PDIRT-E 2021 proposal and issued a

[61] Available for consultation at https://dre.pt/dre/detalhe/decreto-lei/76-2019-122476954

[62] https://www.erse.pt/atividade/consultas-publicas/consulta-p%C3%BAblica-n-%C2%BA-100/.

globally favourable opinion on it, namely on the projects included in the last edition of the European Ten-Year Network Development Plan, TYNDP 2020, and classified as projects of common interest (PCI). Nevertheless, and in order to guarantee tariff neutrality, in a reserved economic context resulting from the crisis caused by the COVID-19 pandemic, ERSE's opinion recommended a reduction in the overall amount of investment in the order of 171 million euros (about 20% of the proposed investment), also suggesting how this reduction could be carried out.

SMART GRIDS

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

In 2021, ERSE published a report about the development of smart grids – "Evaluation of Electricity Smart Grids in 2020"[63]. The report presents an evaluation of smart grids by the end of 2020 and the plans of system operators for their development.

At the end of 2020, there where about 1 million clients integrated in smart grids (16% of the clients at low voltage) but over 3 million clients had a smart meter (52% of the same universe). By the end of 2021, this number was about 4 million, from which 1.7 million meters were integrated in smart grids. With the updated plans in 2022, the system operators estimate that all the clients will be integrated in smart grids by the end of 2024.

The report also concluded that the market, mainly suppliers and clients, still do not take advantage or encourage satisfactorily the new services of smart grids, including discriminated consumption data.

[63] Available online at: https://www.erse.pt/media/thrgy4q5/balancoredesinteligentes2020.pdf

3.1.5 LOW VOLTAGE DISTRIBUTION CONCESSIONS

The electricity distribution activity 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 medium voltage (MV) and high voltage (HV) awarded by the State; and ii) the municipal concessions of distribution in low voltage (LV) awarded by the 278 municipalities of mainland Portugal.

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 end between 2021 and 2022. Their attribution, according to the law, must result from a public tender.

Law n. º 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 in low voltage. This law encourages territorial aggregation (several concessions awarded to a single concessionaire in a single procedure) and the synchronized launch of tenders.

Under the terms of the referred law, in 2019, ERSE prepared a proposal for the territorial delimitation of the concessions area based on technical and economic studies, after public consultation and in articulation with the National Association of Portuguese Municipalities, in which it presented the parameters to be taken into account in the standard tender documents.

According to Article 5(3) of the same law, it is up to the municipalities, as awarding entities, to define the areas to be tendered, namely by accepting ERSE's proposal or by preparing economic studies showing relevant advantages of this alternative scenario for the public interest. The Government must approve the bidding documents.

In this framework, on 30 November 2020, Order n.º 11814/2020, of 30 November, was published, which created a working group for the preparation of the drafts of the procedure documents, programme of the standard tender and standard specifications, of the tenders for the award of municipal concessions for low voltage (LV) electricity distribution.

The working group was coordinated by the Office of the Deputy Secretary of State for Energy and is made up of representatives of the National Association of Portuguese Municipalities, intermunicipal entities with

delegated powers in this area, ERSE, the DGEG and the Institute of Systems and Computer Engineering, Technology and Science.

Through Dispatch n. º 3759/2021 of 13 April, the deadline for the presentation of the draft procedure documents and the draft concession contract for the LV electricity distribution network operation activity, provided for in n. º 6 of Dispatch n. º 11814/2020 of 30 November, was extended by four (4) months.

The Working Group set up for this purpose terminated with the presentation to the Deputy Secretary of State and Energy, during the extension period stipulated, of the draft pieces of the procedure and the draft concession contract of the exploration activity of the LV electricity distribution networks.

3.2 PROMOTING COMPETITION

3.2.1 WHOLESALE MARKET

In 2021, there was a decrease in the electricity market concentration level, due to less favourable hydrological conditions for hydropower generation by the dominant operator, EDP, compared with the previous year and the sale of hydro assets by this mentioned market operator. Despite this situation, there was a decrease in the participation level of thermal power plants, compared to 2020. There was both a decrease in the energy generated by coal-fired power stations (both closed during 2021) and a reduction of combined-cycle natural gas power stations production.

As mentioned in Chapter 3.1.3, in 2021 the price differential hours between the MIBEL areas decreased relative to 2020.

Therefore, from a general point of view, due to worse hydrological conditions and generation assets sales, 2021 was marked by an unfavourable evolution for the dominant operator[64], leading to a decrease 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.

[64] The document "Dominant Operator - Methodology and Applications", by the MIBEL Board of Regulators, defines dominant operator as a company or business group that has a market share of more than 10% of the electricity generated within the scope of MIBEL.

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

PRICES

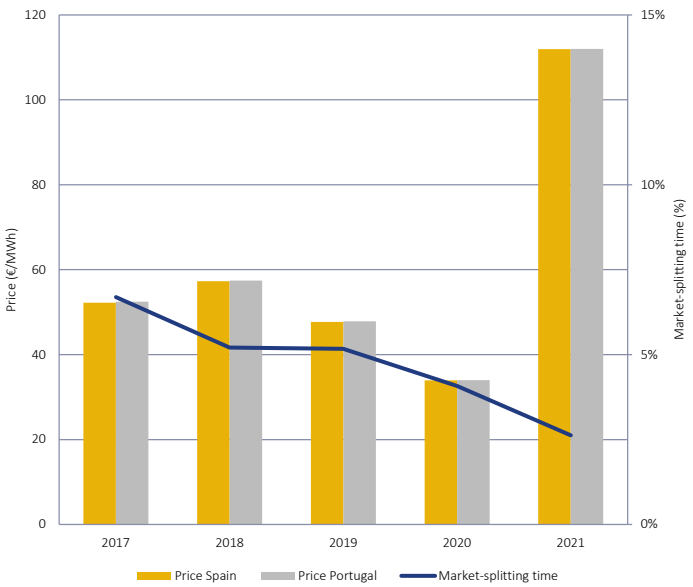
Spot market prices

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.

The evolution of the annual average price in the spot market, in Portugal and Spain, between 2017 and 2021, as well as the percentage of market splitting time are presented in Figure 3-10.

Figure 3-10 – Evolution of annual average spot market price and market splitting, 2017 to 2021



Source: OMIE data

In 2021, the average price on the spot market for Portugal was 112.01 €/MWh, nearly 230% above the price recorded in 2020 (33.99 €/MWh).

Compared to the previous year, there were less favourable hydrological conditions and a resulting decrease in hydropower generation. Thermal production was again heavily impacted by the consequences of the COVID-19 pandemic and confinement measures, with the resulting economic and electricity consumption effects and a decrease in demand for this type of production. However, an upward trend in both natural gas and coal supply costs, and CO_2 license emission markets contributed towards the mentioned sharp increase in Portuguese spot market prices.

In 2021, the average market price in Portugal was approximately 3% above the marginal[65] reference cost for combined-cycle natural gas power plants, excluding the cost component associated with access to the high-pressure natural gas network, and approximately 32% above the marginal cost for coal-fired thermal plants as calculated by ERSE (85.12 €/MWh).

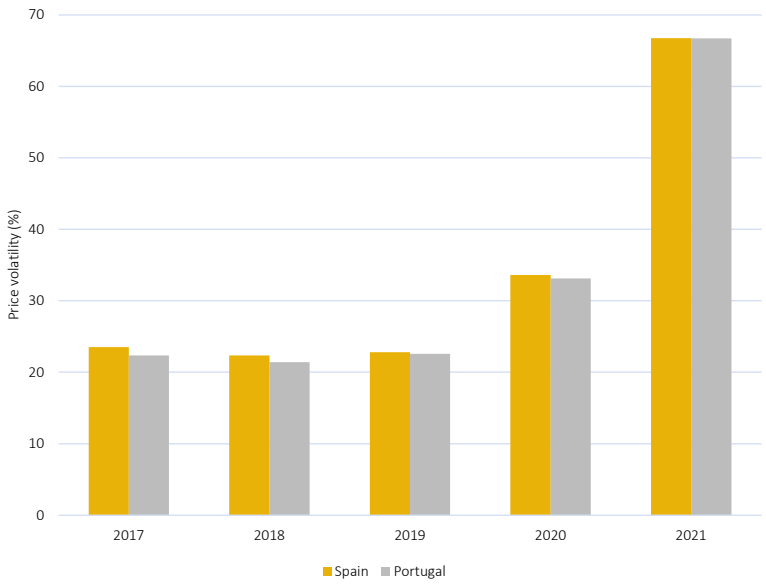
Regarding the setting of the spot market price, the market's volatility is a factor that is considered important by market agents, namely as regards the need to cover price risks.

In 2021, 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 67%, which means prices ranged, on average, between 37 €/MWh and 187 €/MWh.

Figure 3-11 shows the evolution of the annual volatility of the spot market price, from 2017 to 2021, for both Portugal and Spain. It shows an increase in the spot price volatility between 2020 and 2021, as a result of the hydrological conditions and demand instability due to the COVID-19 pandemic but mainly the evolution of the price commodities related to the price formation of thermal power plants.

[65] 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/EN/Electr/MarketInfo/SystemResults/SecReserveAllocation/Pages/PriceAdj.aspx.

Figure 3-11 - Volatility of spot price, 2017 to 2021

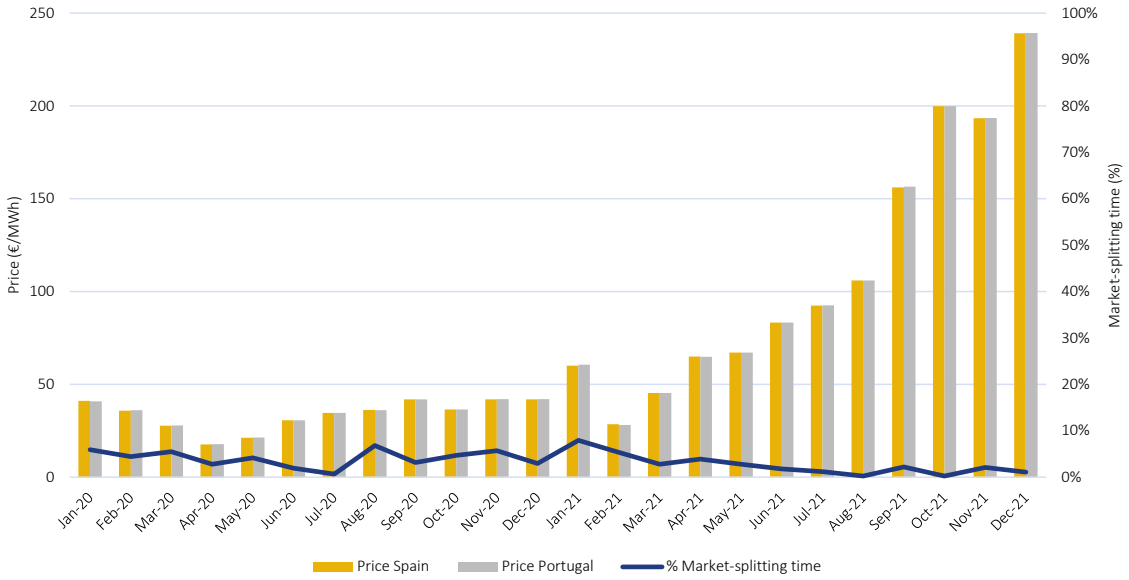


Source: OMIE data.

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

Figure 3-12 presents the evolution of prices in Portugal and Spain and the percentage of market splitting time, on a monthly basis, for 2020 and 2021.

Figure 3-12 - Spot market price and market splitting, 2020 and 2021



Source: OMIE data

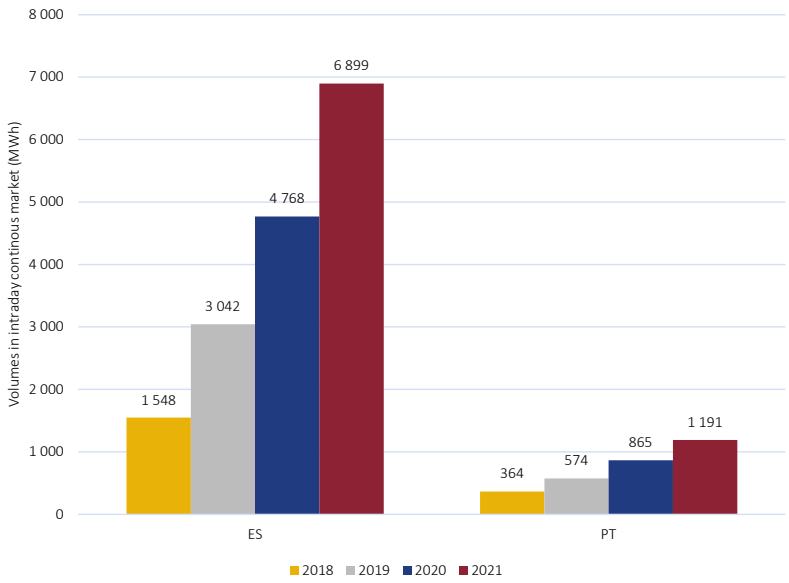
Regarding 2021, the following should be highlighted: (i) a sharp increase in the average market price compared to 2020; (ii) less favourable hydrological conditions throughout the year and a marked increase in commodities related to thermal production; and (iii) a decrease in market splitting compared to 2020.

Intraday continuous market prices (XBID)

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 3-13 presents the negotiated volume[66] since June 2018 until the end of 2021, for both Portugal and Spain.

Figure 3-13 - Negotiated volume in the intraday continuous market, 2018 to 2021



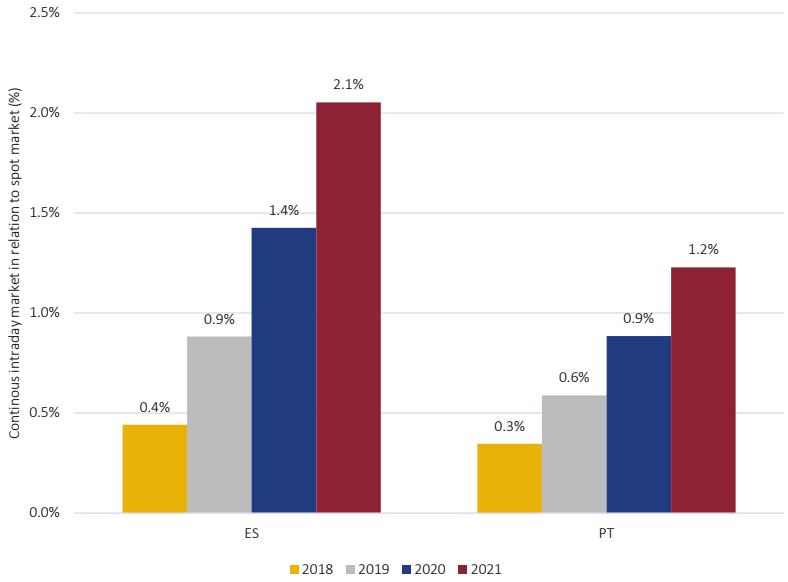
Source: OMIE data

There was an increase in the negotiated volume for each price zone (Portugal and Spain) since the launch of the XBID project.

[66] 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 3-14 compares negotiated volumes between the continuous intraday market and the daily spot market, since June 2018 until the end of 2021, for both Portugal and Spain.

Figure 3-14 - Comparison of negotiated volumes in the continuous intraday market and the daily spot market



Source: OMIE data

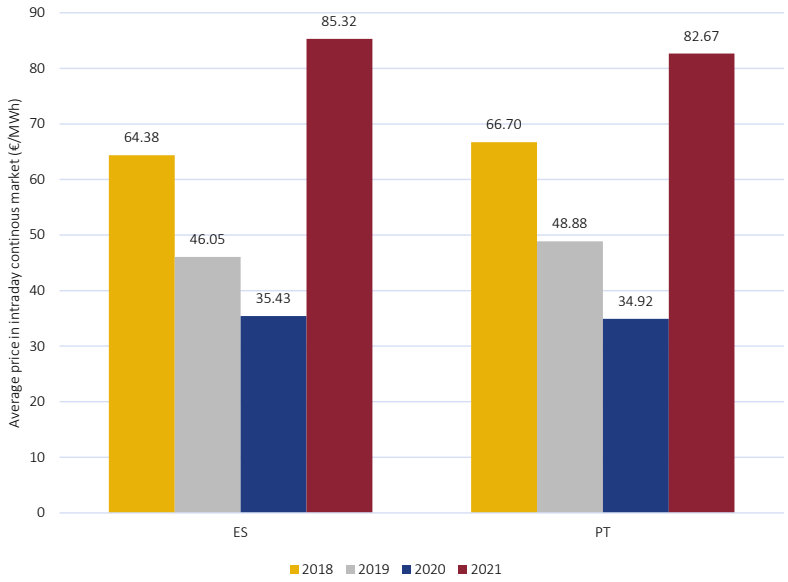
In 2021, the negotiated volume in Portugal in the continuous intraday market amounted to about 1.2 % of the daily spot market volume (around 1 191 GWh). This was an increase in relation to 2020, which can be understood by the development of higher liquidity levels.

Figure 3-15 presents the weighted continuous intraday market price[67] since June 2018 until the end of 2021, for both Portugal and Spain.

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

[67] 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 3-15 - Continuous intraday market weighted average price, 2018 to 2021



Source: OMIE data

Forward market prices

The model for MIBEL's functioning provides for the existence of references for forward contracting 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.

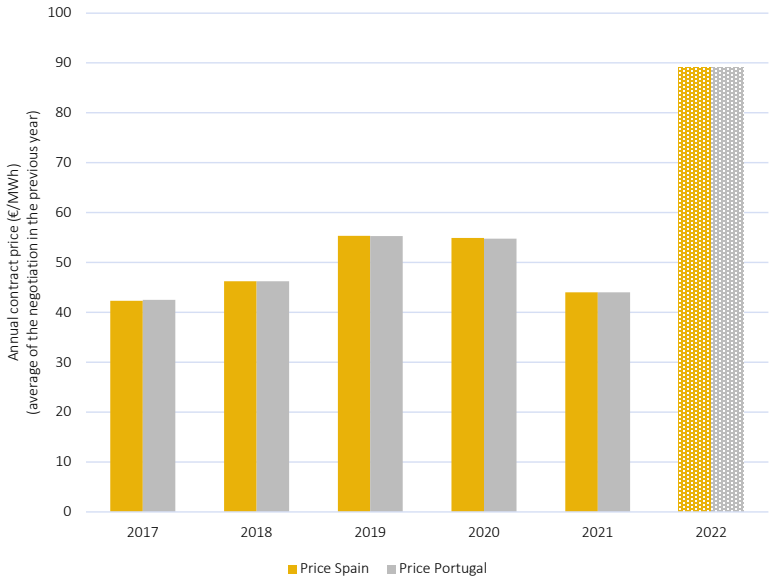
The spot market is a fairly liquid platform in the Iberian context. Specifically in the Portuguese case, approximately 69 % of 2021 consumption was met through contracts made in this market referential[68]. In this context, as there is no intrinsic market problem of liquidity or depth within the definition 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.

[68] Includes daily market and intraday auctions.

The evolution of the price set in the forward market saw a decrease in prices between 2020 and 2021, and a sharp increase between 2021 and 2022. Market agents who had acquired in 2020 a position in a base load contract with a 2021 delivery would have paid an average price (43.91 €/MWh for Portugal[69]) about 61% less than the price set in the spot market. This difference is a consequence of the 2021 evolution of the commodities costs conditions in 2021

Figure 3-16 presents the evolution of the average market closing prices related to an annual contract with a base load delivery.

Figure 3-16 - Evolution of the average price for annual futures contract negotiation (delivery in Portugal and in Spain), 2017 to 2022



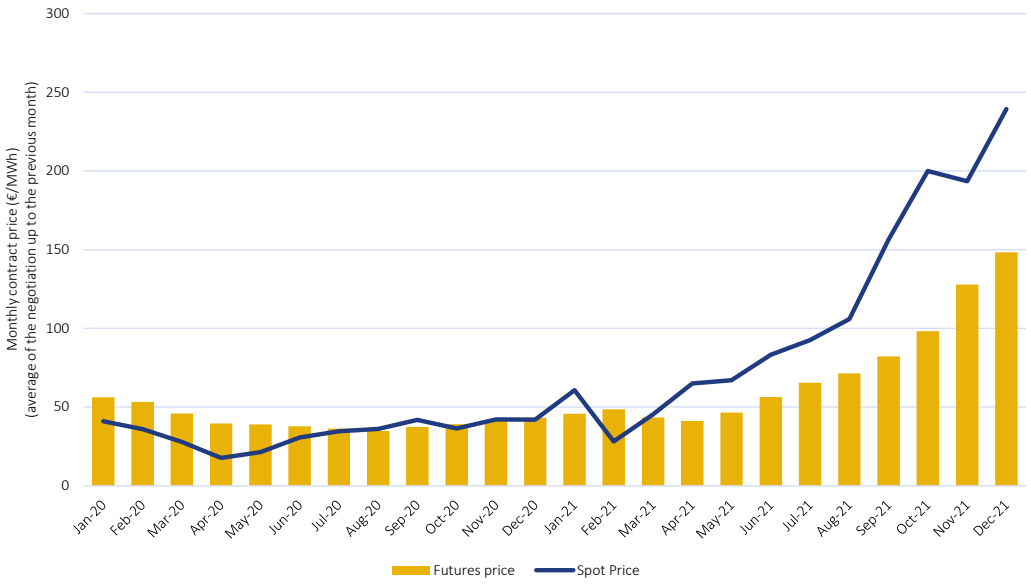
Source: OMIE data. Note: the average closing price for the year prior to delivery, for a base load delivery (e.g. the 2022 price corresponds to the average price set during 2021).

In 2021, 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 in all months except February, when the situation was more favourable for those agents with forward market negotiation. In these months, the agents that ensured that their monthly needs were covered in advance in the forward market had their average spot market price risk annulled.

[69] The value of the forward provisioning price reflects the average weighted value per contract volumes of shares of the 2021 annual contract with delivery in the Portuguese area of MIBEL, including the record of auction, continuous and *over-the-counter* (OTC) operations.

Figure 3-17 presents the evolution of monthly futures contract prices, in the OMIP managed market, and also of the spot negotiation price, both for Portugal. The evolution of the forward price of monthly contracts showed, on average, an upwards trend between the second quarter and the end of the fourth quarter of 2021.

Figure 3-17 - Evolution of the average price for negotiating the monthly futures contract (delivered in Portugal), 2020 and 2021



Source: OMIE and OMIP data

During 2021 as part of the implementation of the forward contracting mechanism for energy acquired from special regime generation, five guaranteed revenue SRG auctions were held, with the placement of five distinct products (one annual base load and four quarterly base loads). These auctions resulted in the placement of a total hourly power output (volume placed) of 590 MW. The variation in the volume was carried out in full by the quantity modulation in the quarterly product (395 MW for each quarter) and the annual product (195 MW). The volume of energy placed with this instrument amounted to approximately 10% of national consumption (5.17 TWh).

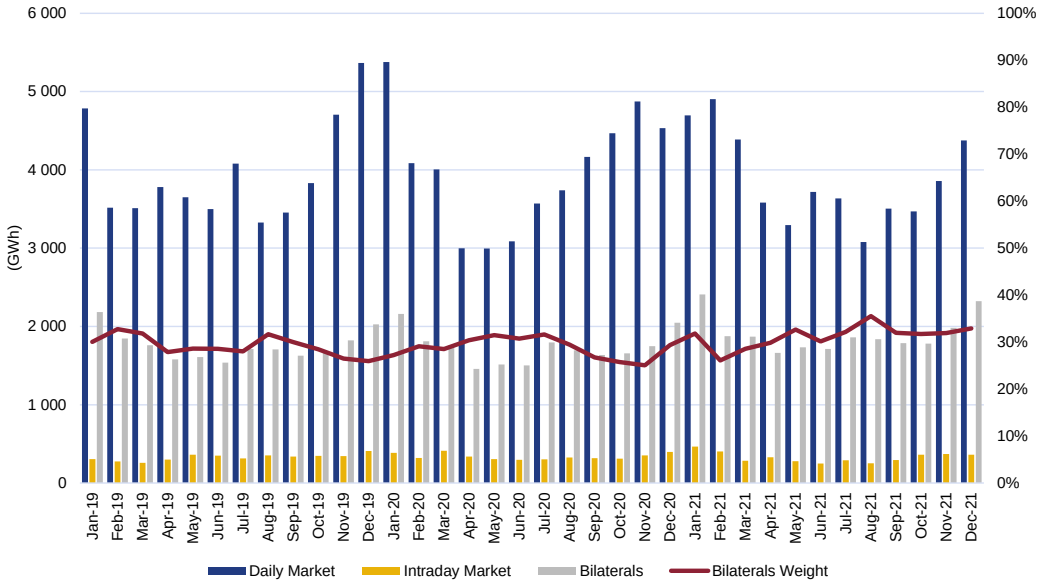
The auctions held for 2021 delivery ensured the full placement of the minimum volumes open for negotiation and allowed a stabilisation of the SRG energy sale price. Furthermore, the existence of the auction mechanism provided risk coverage tools for energy procurement (in volume and in price) which were positively evaluated by market agents.

Also during 2021, 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, with the placement of five distinct products (one annual base load and four quarterly base loads). These auctions resulted in the placement of a total hourly power output (volume placed) of about 147 MW. The energy volume placed with this instrument amounted to approximately 3% of national consumption (1.29 TWh).

The auctions held for 2021 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 3-18. 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 3-18- Breakdown of energy supply volumes between markets, 2019 to 2021



Source: OMIE and REN data

Comparing 2021 to 2020, there was an increase in the average weight of bilateral contracts and also an increase in its absolute value (increase of 10 % equivalent to 2.1 TWh). The average weight of bilateral contracts was 31% or 23 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.

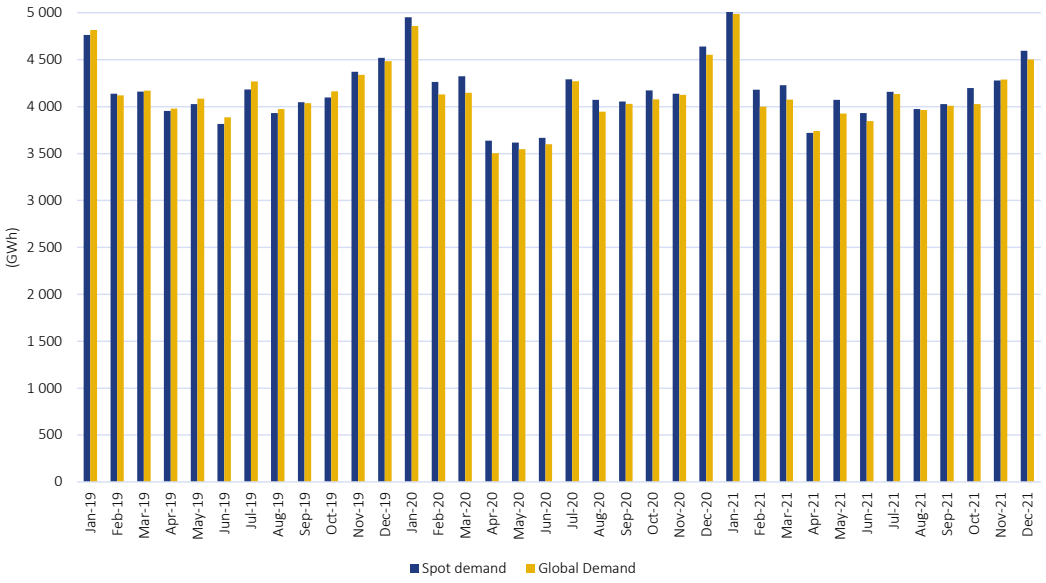
Evolution of the market

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 special regime generators with guaranteed remuneration, their supply is placed on the spot market through the single buyer for SRG - the SOLR - who aggregates the expected generation and submits the offers to the market.

The evolution for both the spot market demand and overall consumption in mainland Portugal is shown in Figure 3-19, where it can be seen that demand is met by spot market acquisitions.

Figure 3-19- Spot market demand and total monthly consumption, 2019 to 2021

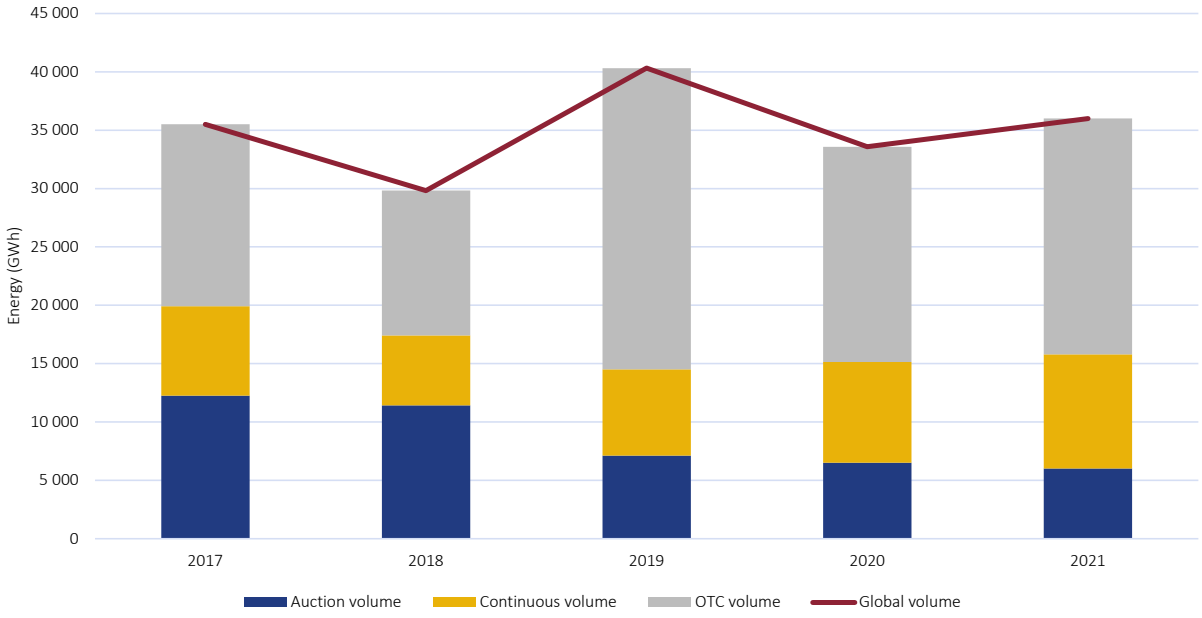


Source: OMIE data

Figure 3-20 shows the evolution of the volumes recorded in the organised forward market between 2017 and 2021. In 2018, a decrease was registered, namely 16% or 5.7 TWh. In 2019, there was an increase, 35%

or 10.5 TWh, despite moving the negotiation of financial capacity rights in the interconnection between Portugal and Spain to the JAO (Joint Allocation Platform), following 5 years during which OMIP undertook the operationalisation of the joint capacity allocation mechanism between Portugal and Spain. 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.

Figure 3-20 - MIBEL forward market volumes, 2017 to 2021



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)[70] regarding the obligation to report insider information.

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

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) n. 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.

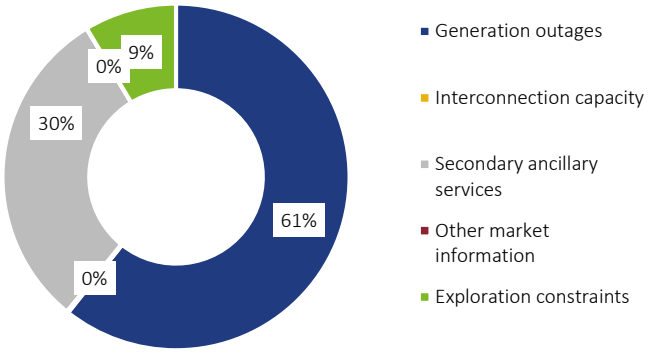
The reporting of transactions and trading orders associated with contracts related to electricity transmission concluded following an explicit primary capacity allocation by the transmission network operator and contracts negotiated outside the organised market platforms began on 7 April 2016 across the entire European Union. The calendar for this reporting was set out in Article 12 of the Commission Implementing Regulation (EU) n. 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 is reported in a centralised manner, and is available on a portal managed by REN[71]. During 2021, 7114 relevant facts were reported. Of these, approximately 61% concerned generation unavailability, 30% secondary ancillary services unavailability and 9% to hydro plants constraints, changes in the interconnection capacity available for the market and respective price setting in the context of MIBEL (Figure 3-21).

[71] http://www.mercado.ren.pt/PT/Electr/InfoMercado/Paginas/default.aspx

Figure 3-21 – Reporting of relevant facts, 2021



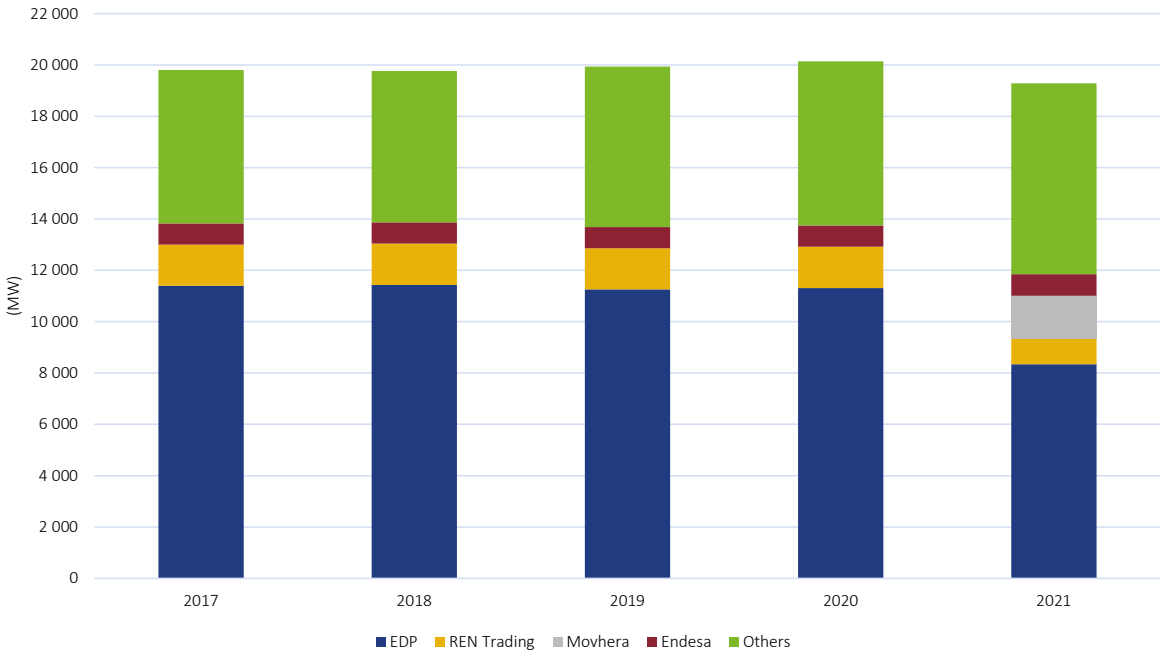
Source: REN data

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 3-22 shows that the EDP group (including EDP Production and EDP Renewables) owns most of Portugal's installed capacity.

Figure 3-22 – Installed capacity in Portugal by ownership, 2017 to 2021



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 announced[72] 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 plant[73]. 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 power plant which was represented by REN Trading ceased its operations in November 2021.

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

[73] https://www.edp.com/en/news/anticipation-shutdown-process-coal-power-plants-iberia

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 3-23. 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 3-24, which presents the Herfindahl-Hirschman Index (HHI[74]) values, measuring corporate concentration.

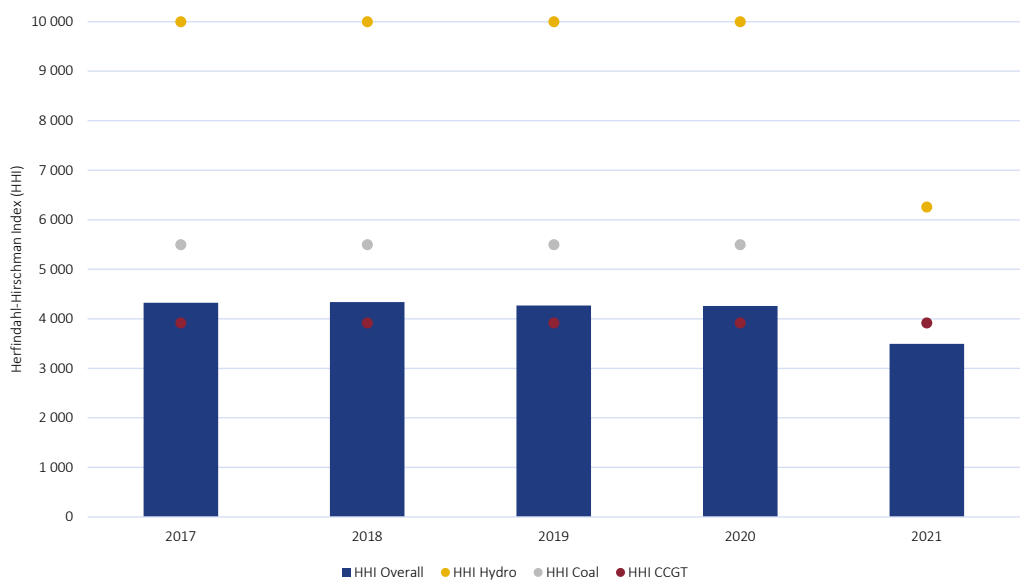
Figure 3-23 – Share of installed capacity by agents and technology for mainland Portugal, 2017 to 2021

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. In the hydro sector in 2021, the effect of EDP's asset sales to Movhera can be seen. It is worth highlighting the end of coal power plants as a means of energy generation.

[74] 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 3-24 - Concentration in terms of installed capacity, 2017 to 2021

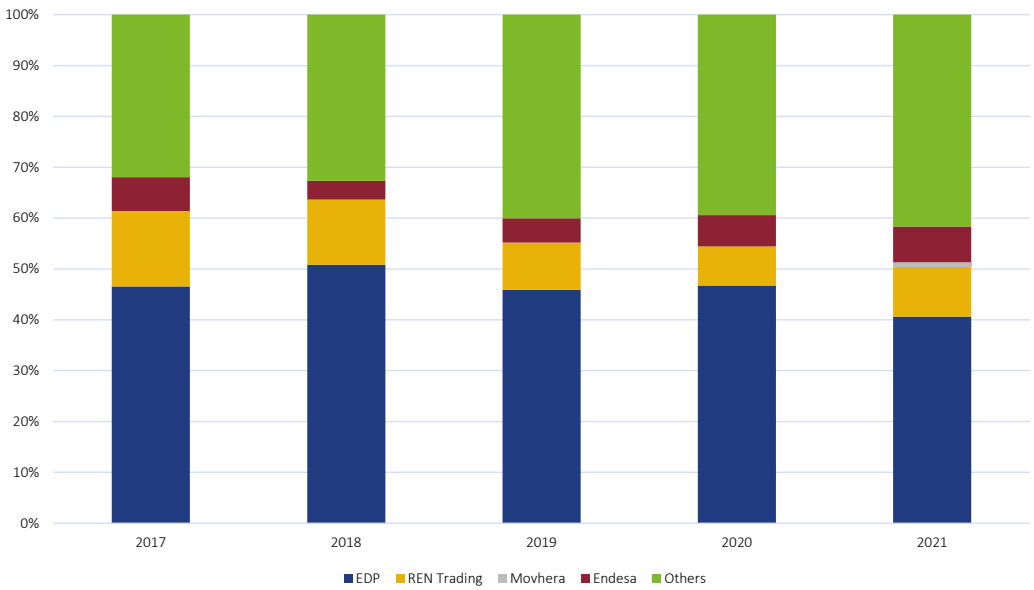


Source: REN data and EDP group

In 2021, the hydro assets sale by EDP contributed to decreasing the concentration of capacity offered in the Portuguese system.

Electricity generation quotas by agent are shown in Figure 3-25.

Figure 3-25 - Energy generation quotas by agent, 2017 to 2021



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 hydro generation due to less favourable hydrological conditions, the sale of hydro assets, the Sines coal power plant closure and a relative decrease in its combined cycle gas power plants production.

Electricity generation quotas by agent considering technology and SRG with guaranteed remuneration are presented in Figure 3-26.

Figure 3-26 - Energy produced by agents by technology, 2017 to 2021

Source: REN data and EDP group

Regarding energy production, the trend between 2017 and 2020 points towards a distinct evolution in the dominant operator EDP's generation quota in each of the main technologies. In 2021, there was a general decrease in EDP's quota in the different technologies.

For SRG, from 2017 to 2021, this situation remained relatively unchanged despite a downwards tendency for EDP.

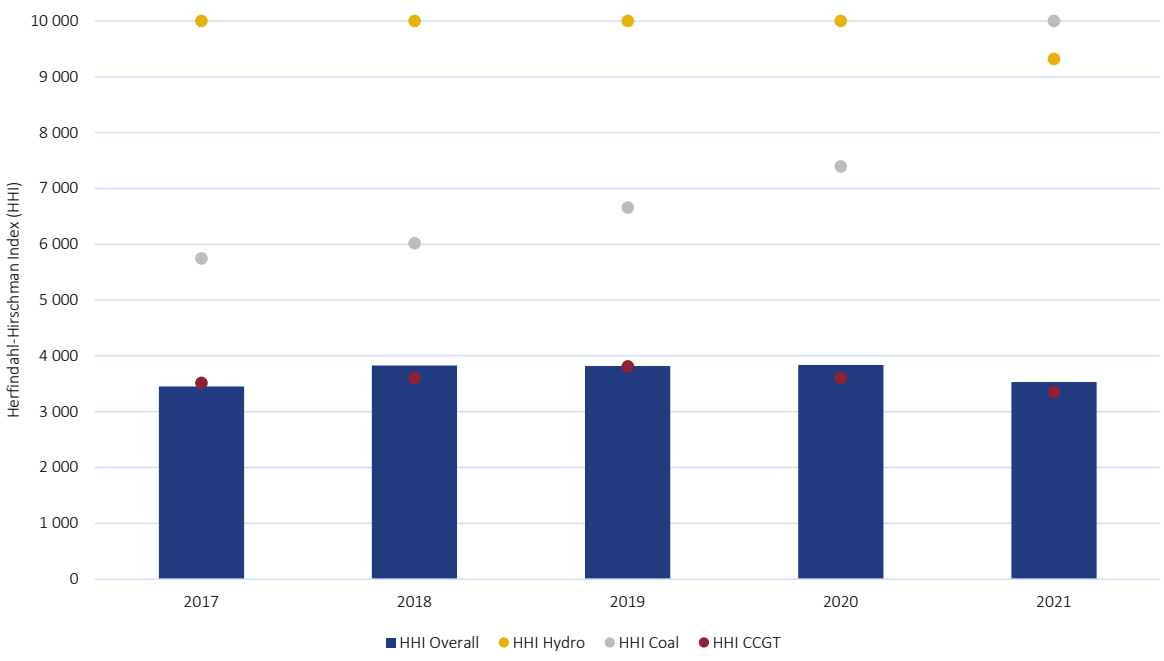
In relation to hydro production, until 2020 the exclusive presence of the dominant operator EDP continued, as it owned all the major hydropower plants. In 2021, the assets sale to Movhera resulted in relative quotas changes.

Regarding natural gas combined cycle plants, there was a generation decrease in 2021 compared to 2020. This decrease of approximately 1.2 TWh, in absolute terms, resulted mainly from the smaller production by the generating assets held EDP (Lares and Ribatejo plants). Endesa (Pego CCGT) had a production increase as well as the assets managed by REN Trading (Turbogás plant).

Coal power plants witnessed a significant production decrease in 2021. This decrease amounted to 1.5 TWh and resulted from decreases by both the EDP Group (Sines plant closure in the beginning of 2021) and REN Trading (Pego plant closure in November 2021).

The concentration indicators for electricity generation presented in Figure 3-27 show that, in 2021, generation was less concentrated than in 2020. This evolution is mainly linked to EDP group's reduced production.

Figure 3-27 - Concentration in terms of electricity generation, 2017 to 2021



Source: REN data and EDP group

The coal concentration level in 2021 is not relevant as it results from Pego plant having operated most of the year as opposed to Sines which closed in the beginning of 2021. Both plants were closed by the end of 2021.

At the same time, one should bear in mind that as a more detailed analysis is not possible, the SRG 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 the special regime generation category cannot be assessed, on the other hand, the figures for overall concentration will be equal to or greater than those that actually occur in the current market structure.

RESEARCH AND MEASURES TO PROMOTE EFFECTIVE COMPETITION

Within the framework of sectorial regulation in matters related to the promotion of competition, ERSE has specific duties granted to it by the legal framework governing the electricity sector as well as other tasks which arise from competition law.

The competition legal framework establishes that the Competition Authority must articulate with sectorial regulatory agencies in concentration control procedures. In that way, before taking a decision the Competition Authority, for operations which are subject to sectorial regulation, requests an opinion from ERSE on the notified operation, setting a reasonable deadline for said input.

Therefore, the institutional and legal framework for competition and the electricity sector states that ERSE must be consulted by the Competition Authority as part of corporate concentration processes, whenever those involved are actors in the electricity market. ERSE's opinion is not legally binding, and the measures for minimising competition risks (also known as operation "remedies") may be monitored by ERSE.

The monitoring of competition in the electricity markets has structural and behavioural aspects. Action on the structural conditions of competition in the market tends to be the responsibility of sectorial regulation, namely through the regulations which must promote principles for the development of market competition. In terms of behavioural performance, ERSE as the sectorial regulator, has specific powers to monitor the functioning of the electricity market and, under the terms of its Statutes, must notify the Competition Authority of possible practices which contravene competition law.

In 2021, ERSE issued five opinions to the Competition Authority regarding the following concentration operations within the electricity sector:

- Opinion on the acquisition of exclusive control by EDP Renováveis, S.A. ("EDP") and ENGIE, S.A. ("ENGIE") over WINDPLUS, S.A. ("WINDPLUS"), company currently jointly owned by OW OFFSHORE, S.L. ("OW") and REPSOL RENOVABLES S.L.U. ("REPSOL"). The operation focused on the electricity production activity. The operation in question was not opposed by ERSE, subject to the submission of additional documentation;
- Opinion on the acquisition of exclusive control by Finerge Estrela, S.A. ("Finerge") and Guild Investments Limited ("Guild"), over the companies Eólica da Arada – Empreendimentos Eólicos da Serra da Arada, S.A., Eólica da Cabreira, S.A. and Eólica de Montemuro S.A. (jointly, "Empresas ACM"). The operation focused on electricity production activities. ERSE expressed its non-opposition to this operation subject to the submission of additional supporting documentation;
- Opinion on the acquisition of exclusive control by Galp Energia SGPS, S.A., through its subsidy Galp Power, S.A. ("Galp Power") over the company Mobiletric, Lda. ("Mobiletric"). The operation focused on the mobile electricity supply activity and electric mobility charging operation activity. The operation in question was not opposed by ERSE, as it did not result in materially relevant changes in the effective competition in the electricity market.

REGULATORY DEVELOPMENTS

Regime for management of risk and guarantees

Recognising the need to change the management of risks and guarantees in the electricity and natural gas sectors, namely with regard to the procedures and means of providing and updating guarantees and their costs and the consequences of non-compliance with obligations by market agents, ERSE launched a public consultation on this topic in October 2016.

The conclusions of this consultation made it possible to carry out a more oriented regulatory review of the electricity sector, undertaken in 2017. With the publication of the electricity RRC in December 2017, the existence of an integrated risk measurement model and the provision of guarantees were established, which were subject to subregulation to detail operational issues.

The approved regulatory framework foresees the existence of a single entity, responsible for carrying out risk assessment and management of guarantees, which centralises the activity of management of

guarantees related to contracts for the use of networks and system services concluded between market agents and the system operator, with the advantage that market agents now have a single entity with whom they relate in the context of providing guarantees in addition to the advantages associated with reducing the risk of default. Until the establishment of this entity, ERSE approved a set of transitional rules, setting the essential principles already enshrined in the electricity RRC, promoting a comprehensive management of guarantees, the differentiation of agents' behaviour and, consequently, a more effective statement on achieving competition in the Portuguese electricity sector, along with containment of system risk.

The rules approved in Directive n.º 11/2018[75], of July 16, and previously subjected to a public consultation of interested parties, namely the TSO, DSO and market agents that operate in the national electricity system, aimed at strengthening the measurement and prevention of risks for the system as a whole and provided for flexibility so that suppliers can choose the deadline for payments to the DSO, which is accompanied by a positive differentiation from complying agents.

Following the publication of Decree-Law n.º 76/2019, of 3 June, which changes the legal regime applicable to the exercise of the activities of production, transportation, distribution and supply of electricity and the organisation of electricity markets previously established in Decree-Law n.º 172/2006, of 23 August, the legal existence of an integrated risk and management of guarantees regime within the scope of the national electricity system came to be enshrined, expressly providing for an integrated guarantees manager and the adoption of prudential management rules.

In that same diploma, Article 58-D delegates to ERSE the regulatory definition of the activity of guarantee management, risk management and provision of guarantees within the scope of the national electricity system, as well as the activity and procedures to be observed by the integrated guarantees manager, aiming at its implementation in a definitive model.

With the conclusion of the legal framework and the evaluation of the experience of applying the transitional model, the adoption of a definitive model should be implemented that enshrines the performance of the integrated guarantees manager, establishes its regulatory threshold and adapts the risk management rules and guarantees to this new reality.

[75] Directive n. 11/2018, establishes the transitional regime for management of risk and guarantees in the national electricity system.

In this context, following a public consultation by ERSE of a proposal for regime for management of risk and guarantees in the context of the national electricity system, Diretive no. 2-A/2020[76], of 14 February, was approved aiming at its implementation at the beginning of the second half of 2020.

In turn, Decree-Law 62/2020, of 28 August, established the organisation and operation the National Gas System (SNG) and the respective legal regime, and also established the legal existence of an integrated system of risk management and guarantees, but this time within the scope of the National Gas System (SNG).

In this context, ERSE submitted for public consultation a model of rules for the management of risks and guarantees applicable to both sectors, duly aligned with the legal context for each, which resulted in the approval of Directive no. 7/2021[77], of 15 April.

Application of the wholesale market competitive balance regime

Decree-Law no. 74/2013, of 4 June, as amended by the Decree-Law no. 104/2019, of 9 August, establishes "a regulatory mechanism aimed at ensuring the balance of competition in the electricity wholesale market in Portugal".

Within the scope of the regulatory mechanism, the relevant power generation units must bear the value of the impact that is generated in the formation of the wholesale price by external events, and such a unitary charge per MWh is applicable to their production which, in the case of hydropower plants equipped with pumping, assumes a net pumping value and, in the case of combined-cycle gas power plants, the part of production that exceeds the operating threshold defined in Article 4(4) should be considered for the purposes of billing charges under Order no. 282/2019, of 30 August.

For the application of the provisions provided by Decree-Law no. 104/2019, of 9 August and other complementary legislation to proceed properly, it is important to establish a set of procedures to be followed by the market agents covered by this legislation in order to ensure the normal functioning of the commercial relationship between the TSO and the power producers within the scope of the regulatory equilibrium mechanism of the wholesale electricity market in mainland Portugal. On the other hand, Article 329 of the RRC provides that "the rules applicable to the commercial relationship between the TSO and the

[76] Directive n. 2-A/2020, establishes the regime for management of risk and guarantees in the national electricity system.

[77] Directive no. 7/2021, which establishes the regime for management of risk and guarantees in the National Electricity System (SEN) and the National Gas System (SNG).

producers, regarding the application of the regulatory mechanism for the competitive balance of the wholesale electricity market in mainland Portugal, are approved by ERSE and are part of the complementary norm relating to the wholesale market competitive balance regime in Portugal."

This set of procedures, systematised by the ERSE Directive no. 4/2020, of 20 March, were preceded by a consultation with interested parties. They establish the deadlines and the information to be sent to ERSE by the TSO and by the covered electricity generation units so that the values of the extra-market events can be calculated and the unitary values can be applied within the scope of the competitive equilibrium mechanism, broken down by technology specialisation and by exercise to report the total values of energy injected into the national electricity system's networks. The Directive also stipulates the billing frequency and the content of the invoice to be issued by the TSO to the market agents concerned.

3.2.2 RETAIL MARKET

Throughout 2021, we continued to witness a consolidation of the liberalised retail market, both in terms of the overall consumption of electricity and the number of customers.

Structural factors, such as the phase-out of regulated tariffs for end-customers and the adoption of transitional tariffs; the adoption of regulated risk coverage mechanisms by suppliers; and enhanced transparency in the communication of available offers to end-consumers, continued to allow new suppliers to operate on the free market.

However, in terms of circumstantial factors, and as a consequence of the acts that preceded the beginning of the offensive against Ukraine and the energy crisis, there were prices registered in the wholesale market that increased the commercial risks of the suppliers, particularly those suppliers with offers with fixed price, which led to the exit of 4 suppliers from the liberalised market in the Portuguese electricity sector.

At the end of 2021, there were 30 suppliers operating on the market, 29 of which present in the household consumer segment.

Despite the energy crisis situation, experienced especially from the third quarter of 2021, supplier switching was marked by a significant penetration of suppliers on the liberalised market in segments such as customers with the highest consumption, large customers and industrial consumers, but also in the household consumer segment: approximately 88% of household consumers were already in the liberalised market at the end of 2021 (1 percentage points (p.p.) more compared to the end of 2020). The intensity of supplier switching was still high – around 17% in 2021 – when compared with other European countries.

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

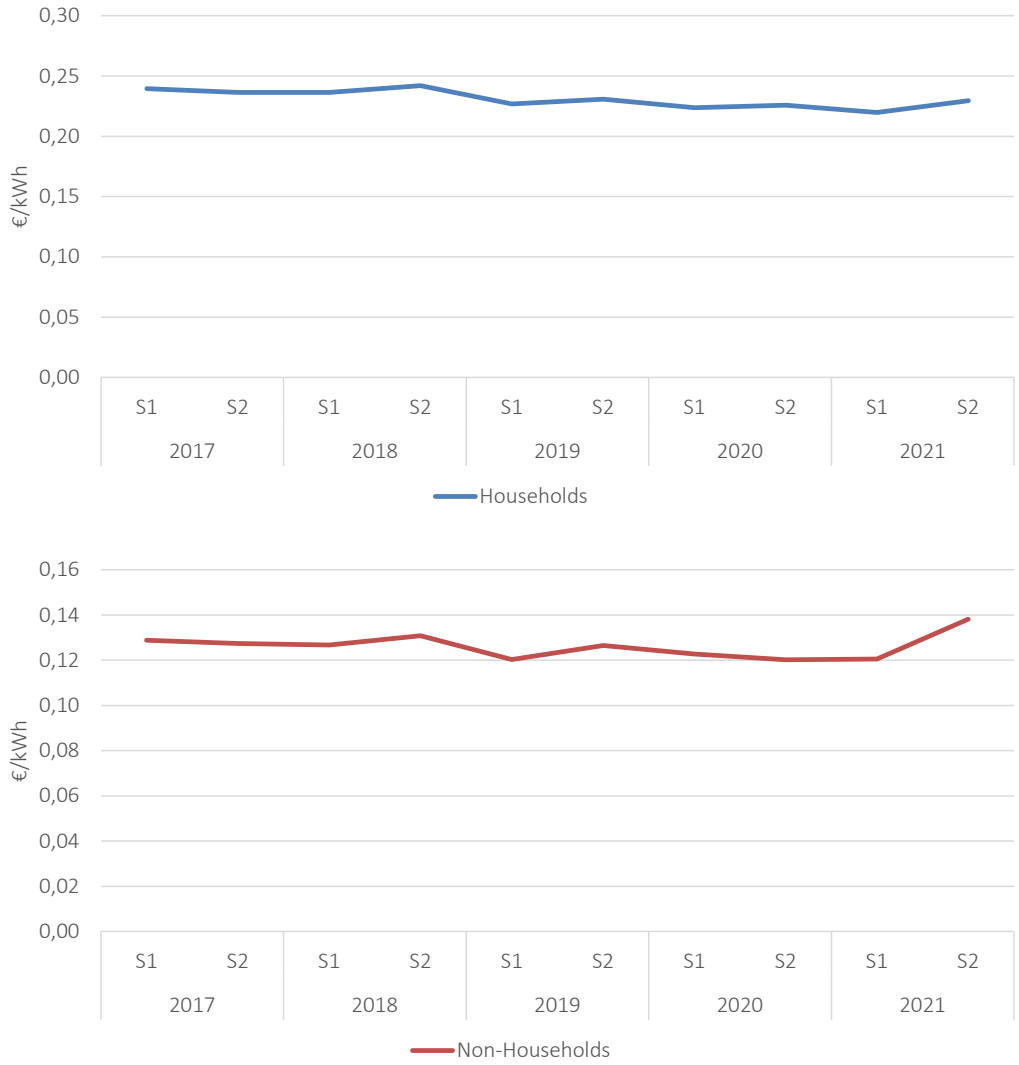
According to ERSE's legal competences regarding electricity market monitoring and its position as the information focal point for consumers and other agents regarding the prices applied, ERSE receives information from suppliers on actual prices charged to consumers in the retail market, as well as updated information on the reference prices they offer or expect to offer for all LV electricity supply[78].

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 3-28 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.

[78] Under the terms of Order no. 18637/2010, of 15 December.

Figure 3-28 – Evolution of electricity average prices for household consumers (with VAT, taxes and other levies) and non-household consumers (without VAT)



Source: Eurostat, ERSE.

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-making[79]; 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 StLV[80].

The analysis of standard offers sent by suppliers shows that at the end of 2021 and for the representative household customer[81], there were 21 suppliers in the market, with 198 electricity-only offers and 129 dual offers (electricity and natural gas), totalling 327 commercial offers, continuing the growth trend in the number of offers.

In the same period, the commercial electricity offer with the lowest monthly invoice had a value of 81.26 euros/month, which corresponds to a discount of about 14% and a monthly savings of 13.38 euros compared to the regulated tariff. For dual commercial offers (electricity and natural gas), the dual commercial offer with the lowest monthly bill had a value of 45.00 euro/month (electricity component), which corresponds to a discount of 10% and a monthly savings of 4.93 euros compared to the regulated tariff.

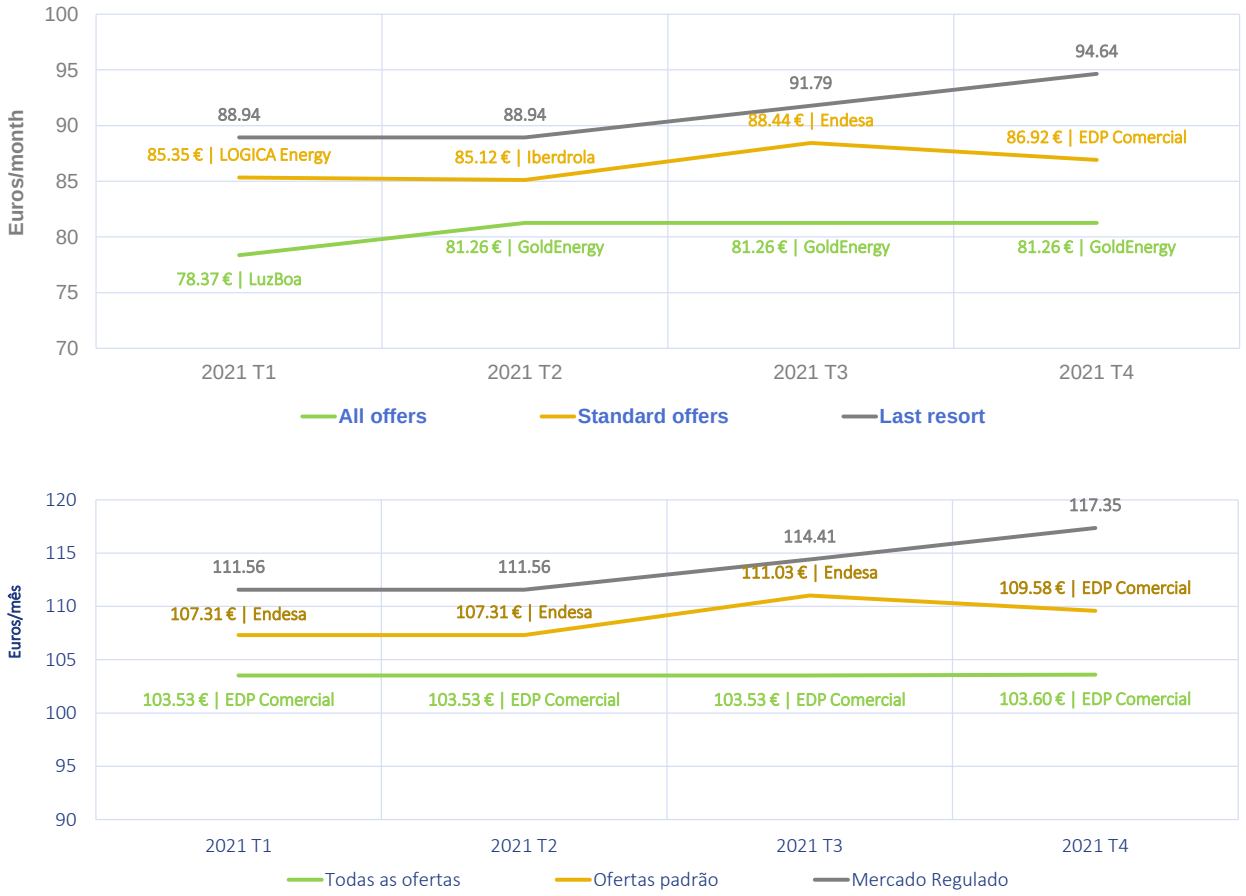
Figure 3-29 shows the evolution of monthly invoicing of the most competitive electricity offer and dual offer in 2021. Over the period under analysis, electricity offer and dual offer of minimum value are always more competitive than the regulated market tariff, with a continuation of this difference throughout the first three quarters of 2021 and an increase in the 4th quarter of 2021, based on all commercial offers. In the fourth quarter of 2021, the difference with the regulated market corresponds to 13.38 euro/month and 13.75 euro/month, respectively for electricity offer and dual offer, based on all commercial offers.

[79] See https://www.erse.pt/simuladores/precos-de-energia/.

[80] Newsletter of the Electricity Commercial Offers.

[81] 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 3-29 - Monthly billing of the most competitive electricity offer and dual offer for type 2 consumer in 2021



Source: ERSE data

Prices shown include applicable taxes and fees, except the DGEG fee for electricity and the underground occupancy fee 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 Portugal[82]
- Simulation of contracted capacity[83]
- Electricity labelling simulator[84]

On 8 March 2021, ERSE's energy price comparison tool started to introduce the following new features:

- Simplification and improvement of the graphical display of the simulator page;
- Intermediate VAT of 13% in the first 100 KWh of monthly consumption;
- Filter for inclusion of the VAT rate discount applicable to large families;
- New simulation option based on the consumer's monthly invoice amount;
- Filter offers with exclusive discounts for new customers;
- Possibility of inconsistent information warning between the tool and other sources;
- Reorganization of the results page, highlighting the comparision customization menu;
- Breakdown of existing components in an energy bill by: network access tariffs, energy component, cost with other services, discounts/refunds and fees and taxes.

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.

[82] Available at https://www.erse.pt/simuladores/precos-de-energia/ (Portuguese only).

[83] Available at https://www.erse.pt/simuladores/potencia-contratada/ (Portuguese only).

[84] Available at https://www.erse.pt/simuladores/rotulagem/.

In addition to this tool, ERSE also provides on its website all the information on reference prices and other contractual conditions that support the functioning of the comparison tool for StLV offers, thus making information access to all interested parties.

Since 2017, ERSE provides a social tariff calculator, 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 rates 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, ERSE approved[85] 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.

Within the scope of the equivalent regime[86], 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 consumer 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 tariffs. The minimum content and the way of providing information to customers regarding the application of the equivalent regime, was approved by ERSE in 2018[87].

In regulatory terms, suppliers with more than five thousand customers[88] continue to be obliged to disclose publicly their commercial offers[89], as well as the general conditions of contracts for StLV customers. Additionally, when expressly requested, the supplier must submit a proposal for the supply of electricity

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

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

[87] Directive no. 1/2018, of 3 January.

[88] Under the terms of Article 105 of the RRC, "when suppliers have 5,000 or more customers, it is assumed that their trading activities cover all types of electrical power supply."

[89] Through the communication channels at their disposal, in particular the internet.

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.

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 CIEG[90] as well as labelling of electricity[91].

Also with regard to electricity bills, electricity suppliers continue to be obliged[92] 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.

Rules for customers to access information on electricity consumption are regulated by ERSE under the Measurement, Reading and Data Availability Guide[93] and, since 2019, in the Code for Smart Grid Services, as regards StLV installations[94]. With regard to metering rules, EHV, HV, MV and SpLV facilities are equipped with remote metering systems (telemetering), with daily collection of four-hourly records. As far as BTN is concerned, by the end of 2021, 64% of electricity consumers had smart meters installed. Of these, approximately 1.7 million installations were already integrated into smart grids and benefiting from their services. Pursuant to Decree-Law no. 15/2022, of January 14, the Government approves the schedule for the installation of smart meters, following ERSE's proposal, and its integration into the infrastructure of smart grids, ensuring the coverage of 100% of final customers by 2024. The main services of smart grids include, for example, invoices based on actual consumption, without estimates and actual daily reading of each customer's consumption and access to real consumption data more frequently and in greater detail, through electronic means, or the provision of services remotely (e.g. the change in contracted power).

In facilities connected at StLV that do not have a smart meter, readings are done locally every 3 months. The DSO is obliged to provide a toll-free telephone assistance service to all its customers so they can submit their own readings[95]. The meter readings provided by the customer and by the DSO have the same legal value for billing purposes.

[90] Articles 121 and 132 of the electricity RRC (Portuguese only).

[91] Articles 105 e 133 of the electricity RRC (Portuguese only).

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

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

[94] Approved by Regulation No. 610/2019 of 2 August 2019.

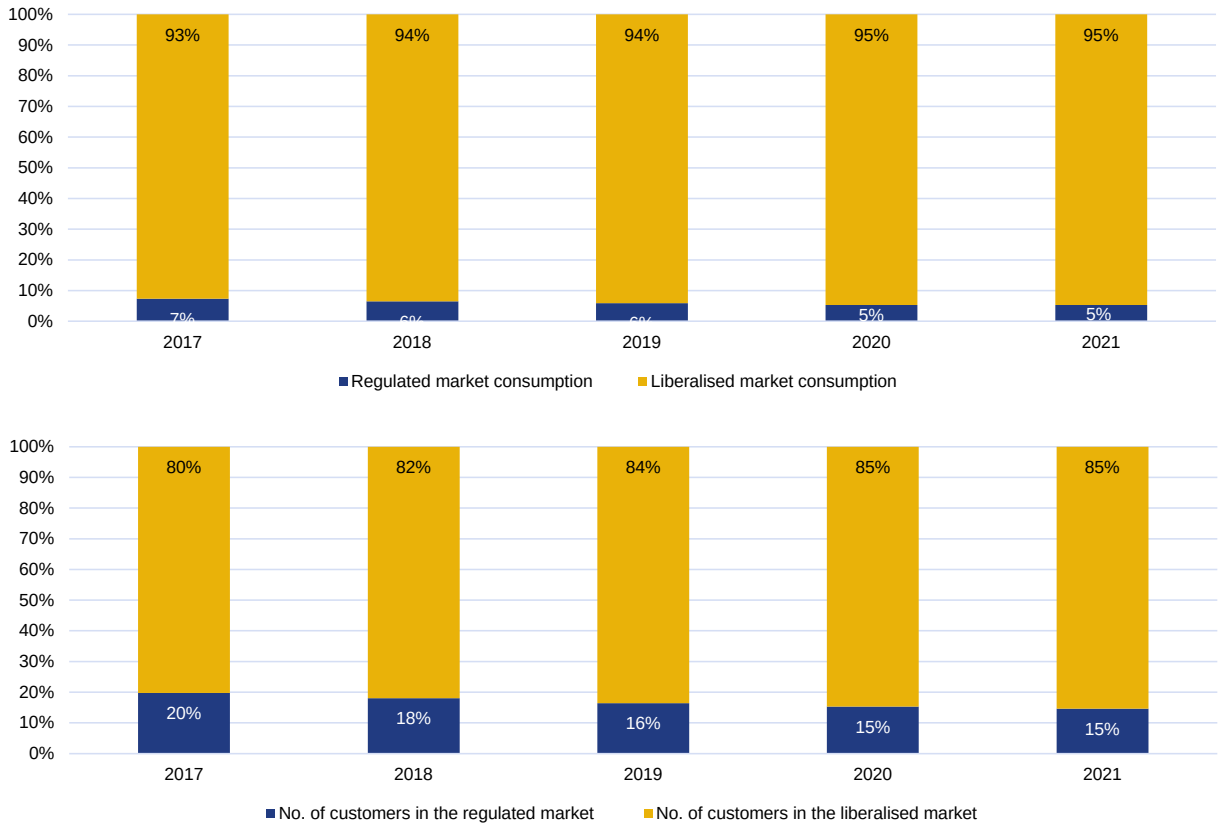
[95] Under the terms of Article 35 of the Electricity and Natural Gas RQS.

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 clients in January 2013, including household customers, despite their 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 electrcity market in mainland Portugal between 2017 and 2021 can be seen in Figure 3-30.

Figure 3-30 – Breakdown of consumption and number of customers in the regulated and the liberalised electricity markets, 2017 to 2021



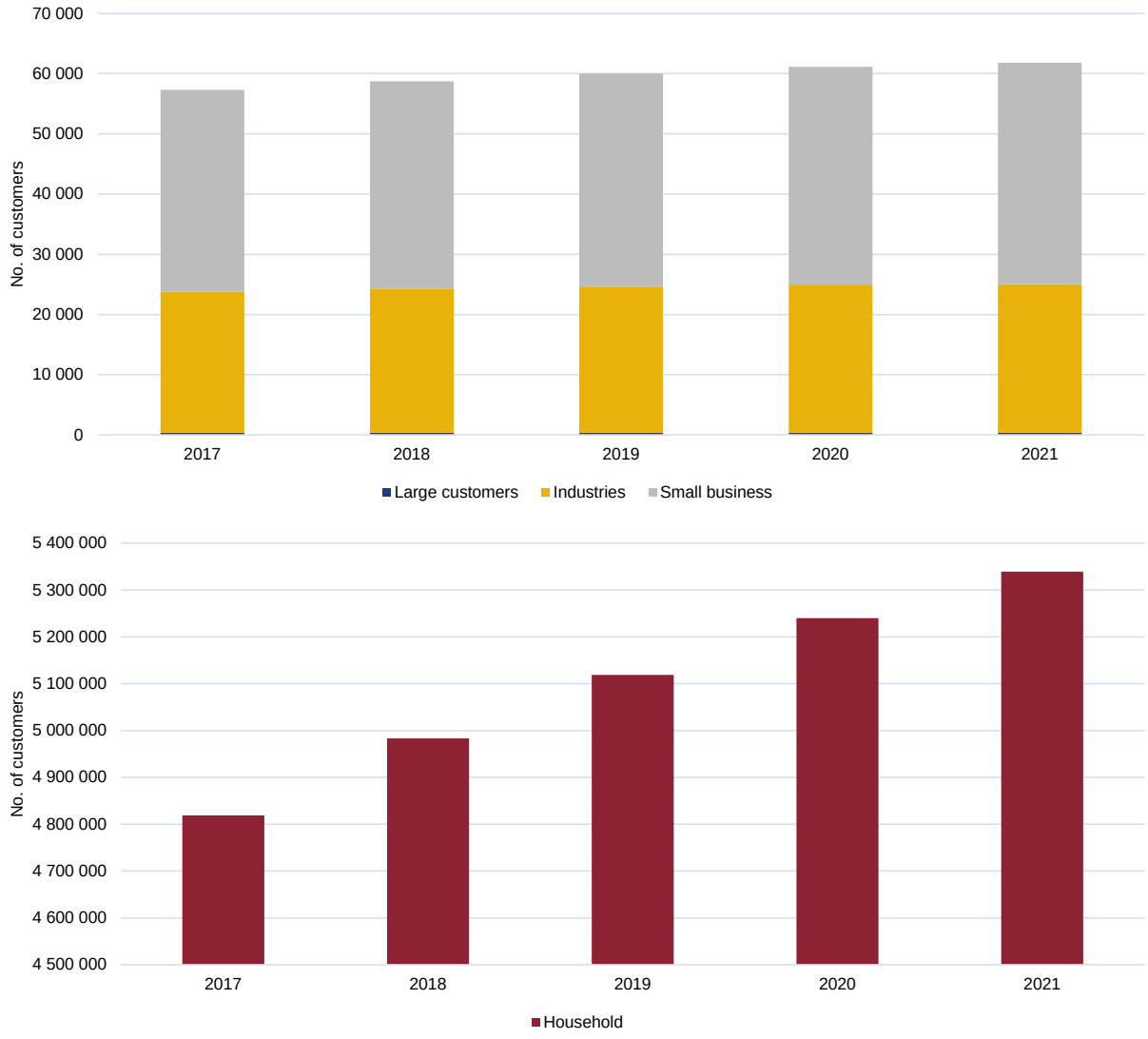
Source: REN and Adene data

The phasing out of regulated tariffs, as explained previously, has contributed to an increase of the liberalised market dimension. With this evolution, consumption in the liberalised market represented approximately 95% of total consumption at the end of 2021.

With regard to the total number of customers, the gradual increase in the size of the liberalised market in the period analysed is essentially due to the continuing entry of household customers, which in 2021 increased about 2% compared to the previous year, representing 85% of all customers.

Figure 3-31 shows that in 2021 the segments with higher consumption – large customers (EHV[96] and HV), industrial customers (MV) and small businesses (SpLV) – continued to experience growth between 1% and 2% in the liberalised market.

Figure 3-31 - Evolution of the liberalised electricity market in mainland Portugal, 2017 to 2021



Source: Adene data

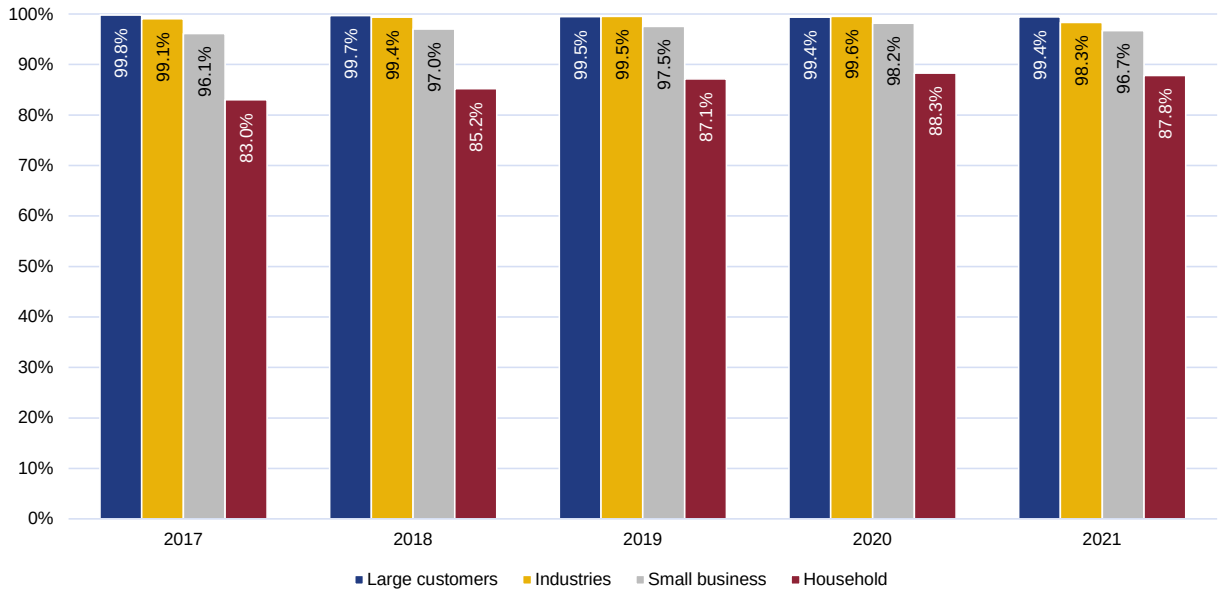
[96] All EHV customers have been in the liberalised market since July 2013.

The level of consumption associated with each customer segment of the liberalised market is shown in Figure 3-32, and it can be noted that in 2021 almost all of the consumption by large customers was ensured by market suppliers. The same happened with more than 98% of consumption by industrial customers.

As regards the number of household customers, and despite the fact that this customer segment still has a lower penetration in the liberalised market, approximately 88% of the customers in this segment have already made the transition to the liberalised market.

In 2021, there was a slight reduction in the penetration in the liberalised market for most of the customer segments. This is due to the activation of "last resort supply"[97] for two suppliers (one of which will take effect in 2022) and "preventive last resort supply"[98] for another two suppliers, which implied the transfer of their customer portfolios to the supplier of last resort.

Figure 3-32- Penetration of the liberalised market by customer segment, 2017 to 2021



Source: Adene data

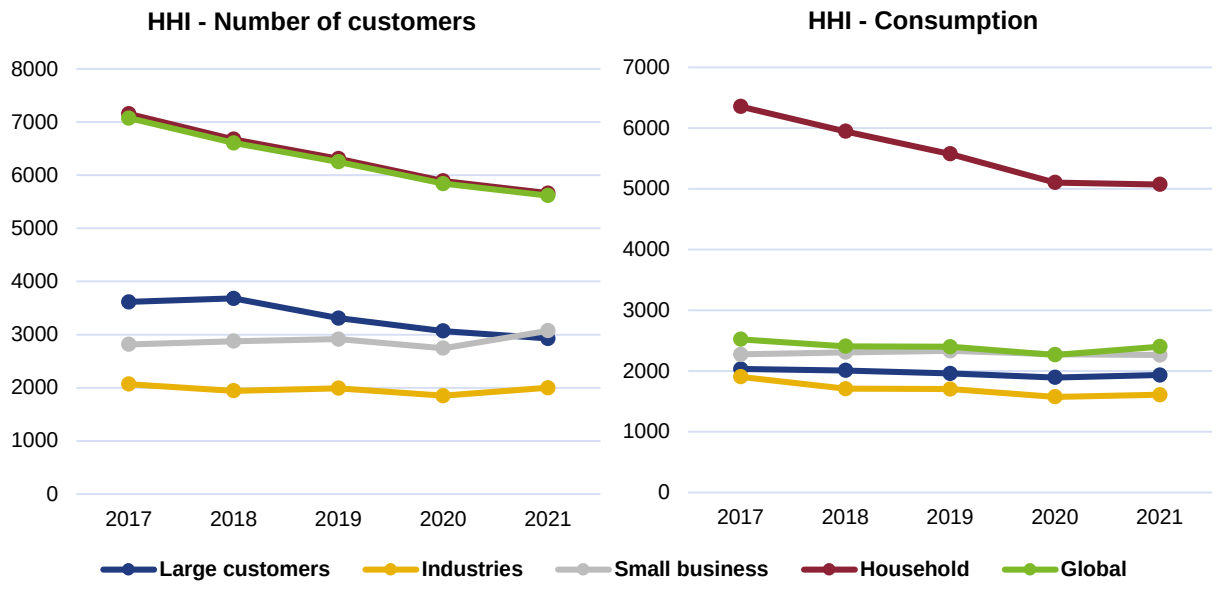
In the liberalised market, an analysis by segment indicates that, in 2021, the industrial customer segment is the most competitive of all, while the household customer segment had the most market concentration.

[97] Foreseen in the Commercial Relations Code, in this case, due to bankruptcy.

[98] Foreseen in the extraordinary measures, due to the energy high prices, and to prevent supplier bankruptcy.

Despite the growth of the liberalised market, overall business concentration remained high in 2021, as shown in Figure 3-33, mainly due to the concentration in the household segment. However, and despite a slight increase of the indicator in terms of consumption, essentially due to the application of "last resort supply", the figure also shows that there is a sustained downward trend of this indicator.

Figure 3-33 – Evolution of market concentration in number of customers and consumption, 2017 to 2021 (HHI)

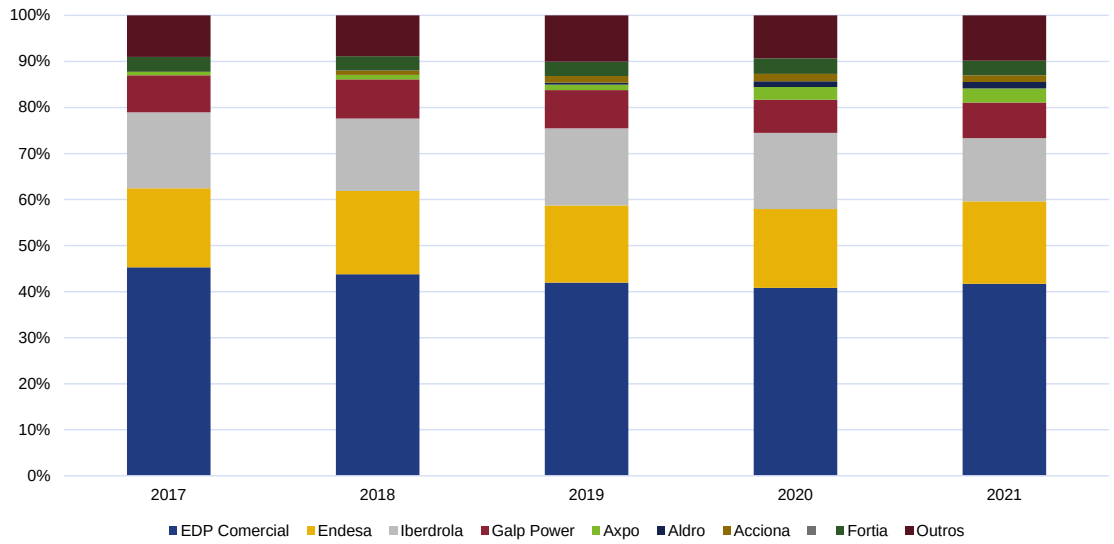


Source: Adene data

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 represented around 40% of supplies on the market in the last year, as shown in Figure 3-34.

Even so, it should be noted that EDP Comercial has been consistently losing market share over the last few years.

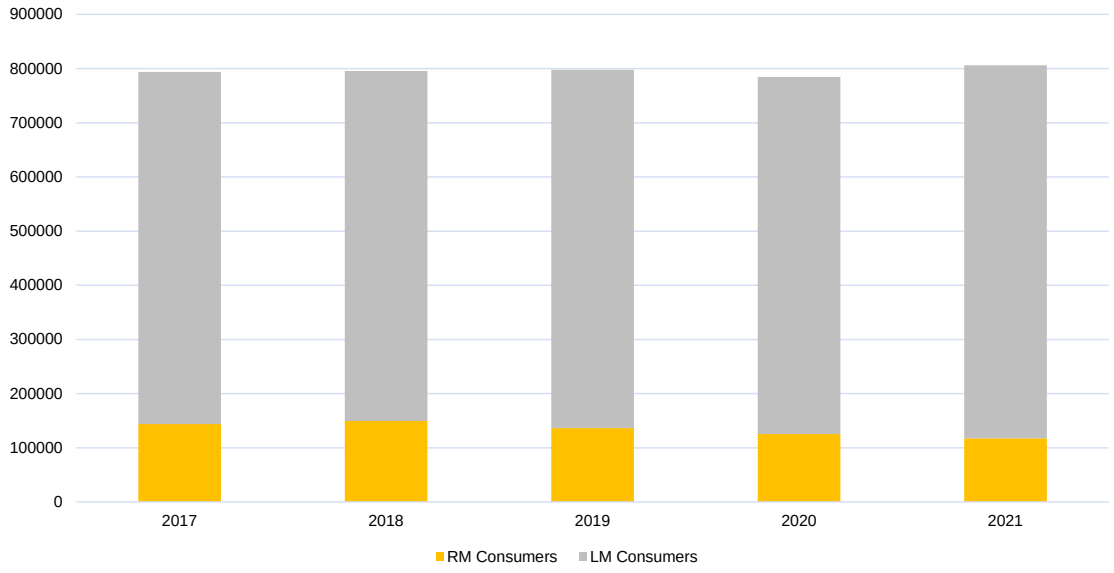
Figure 3-34 - Supply structure in the liberalised market by supplier, 2017 to 2021



Source: Adene data

At the end of 2021, 806 086 consumers in the electricity sector were covered by social tariffs, 117 402 in the regulated market and 688 684 in the liberalised market, as shown in Figure 3-35. Globally, 12.7% of electricity consumers in mainland Portugal were on the social tariff, which represents an increase of 12 p.p. since 2013.

Figure 3-35 – Number of consumers on social tariffs, electricity sector, 2017 a 2021

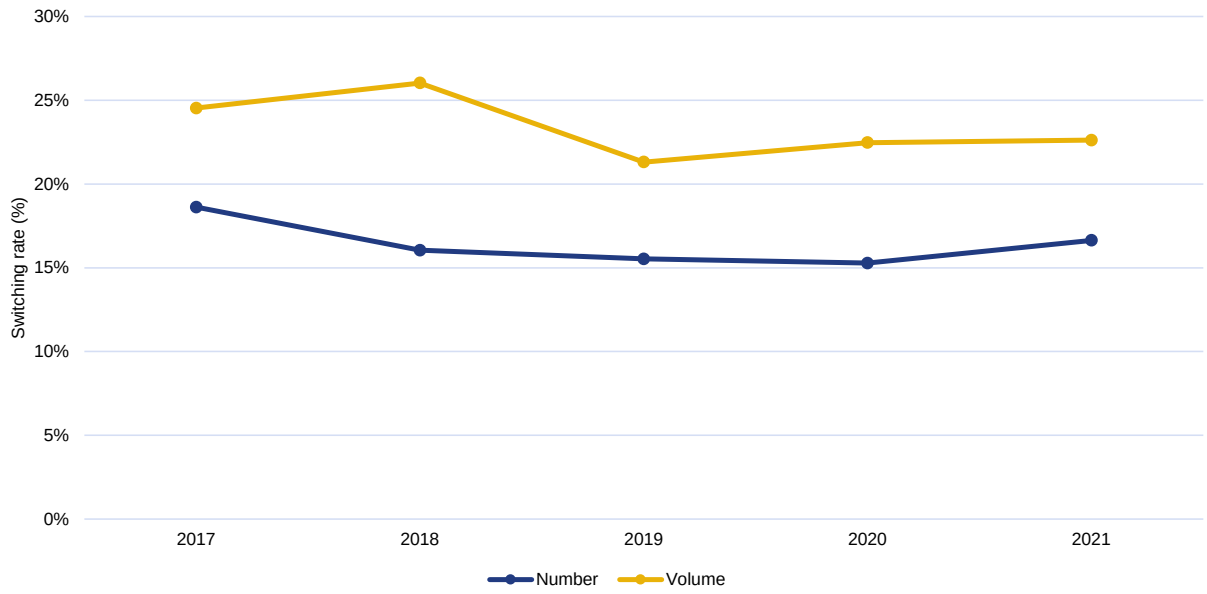


Note: LM - liberalised market; RM - regulated market

Source: Suppliers data.

Despite a downward trend, supplier switching rates[99] were still significant: in 2021, approximately 17% of electricity consumers switched supplier, as shown in Figure 3-36; switches within the liberalised market represented approximately 8.8% of this number. In 2021, 29 328 returns to the regulated market were registered, which represents 452 GWh.

Figure 3-36 - Supplier switching, 2017 to 2021



Source: Adene data

When comparing the consumption of customers who returned to the SOLR with the total consumption of customers that changed supplier within the liberalised market, it is possible to verify that during 2021 this value corresponds to 5.5%, due to the activation of last resort supply for three suppliers[100]. In previous years, this value was very insignificant, since returns to the SOLR only accounted for 0.1% of consumption in terms of switches within the liberalised market.

[99] 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 2021 to be divided by the average number of customers in mainland Portugal during 2021. 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 2021 to be divided by the average annual consumption in mainland Portugal during 2021.

[100] The effect of the implementation of this measure on the portfolio of a fourth supplier was only felt in early 2022.

An analysis of the evolution of the retail market is available on the ERSE website in the form of a monthly report[101], 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 2021, ERSE did not publish recommendations on the conformity of supply prices in accordance with Article 59 of Directive (EU) 2019/944 of the European Parliament and the Council of 5 June[102] within the framework of the free market.

As regards the regulated market, Directive no 11/2021 of 21 June carried out an extraordinary revision of the energy tariff in the electricity sector with effect from 1 July. As a result of the increase in energy prices in MIBEL, in particular spot market prices during the first months of 2021 and in forward market prices for the year 2021 in general, ERSE updated the energy tariff up +5 euros/MWh.

ERSE Directive no 12/2021 of 14 September carried out the 2nd extraordinary review of the energy tariff applicable by the SOLR, with effect on the tariff for the sale to final customers of the SOLR. The approved tariffs entered into force on 1 October 2021. Again due to the increase in energy prices in MIBEL, with an impact on the cost of supplying the SOLR for the whole of 2021, ERSE carried out a further update of the energy tariff, by +5 euros/MWh, with effect from 1 October 2021.

These energy tariff updates were passed onto all active energy prices in tariffs for sale to final customers of the regulated market in mainland Portugal and the Autonomous Regions, including their social tariffs, adjusting the value for losses per hourly period and by voltage level. Based on the type consumers used in ERSE's energy price comparison tool, the estimated impact of each energy tariff update for consumers in the StLV regulated market was approximately +3% in the total electricity bill.

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

[102] Article 37(1) point o) of the Directive.

The extraordinary review mechanism is provided for in Article 144-A of ERSE's electricity Tariff Code, which provides for the adjustment of the energy tariff if there are significant deviations in the average energy price of the SOLR from the value included in the energy tariff to be paid by consumers in the regulated market. The energy tariff update should occur whenever the deviation in absolute value is equal to or greater than 10 €/MWh, in which case the energy tariff should be revised at a fixed value of 5€/MWh (βt =50%).

It should be noted that the transitional regime for regulated electricity sales tariffs for end customers in StLV, SpLV and MV has remained in force, and transitional tariffs for HV are no longer published.

MEASURES TO PROMOTE EFFECTIVE COMPETITION

In 2021, one of the aspects that underwent regulatory changes, in order to promote a better functioning of the retail market, by contributing to mitigating the systemic risk related to the breach of supplier obligations within the scope of the contracts for the use of networks and for system services between market agents and system operators, was the stabilisation of the process related to the integrated management of guarantees process for the electricity sector and its extension to the natural gas sector, through the realisation of a definitive model, as described in the regulatory developments on the risk and guarantee management regime.

During 2021, and due to the repeated occurrence of historically high prices, ERSE published a Regulation[103] that provides the possibility for suppliers to request the application of last resort supply to their customer portfolio, when they are unable to ensure the regular exercise of their activity under conditions of economic viability in the short term, thus avoiding their definitive exit from the market and consequent systemic risk for the SEN and SNG.

ERSE also publishes information on the suppliers covered (to date) by the application of preventive last resort supply on its respective internet portal. In 2021, and for the electricity sector, the suppliers covered by the supplementary supply process (all processes) and the respective number of affected customers (transferred to the SOLR) are shown in the following table:

[103] Regulation n.º 951/2021

Table 3-10 - Electricity suppliers covered by a supplementary supply process

Date	Supplier	Nr. Of clients
10/09/2021	HEN – Serviços Energéticos, Lda.	3 764
12/10/2021	PH Energia, Unipessoal, Lda.*	5 289
19/10/2021	Enat – Energias, Lda.*	4940
16/12/2021	ECO CHOICE, S.A.	906

NOTE: * - Suppliers covered by preventive last resort supply process.

This Regulation also establishes an extraordinary mechanism for the sale of electricity acquired by the SOLR from producers under a special regime, through a competitive auction, based on a pay-as-bid mechanism, accessible to suppliers with a market share equal to or less than 5%.

In 2021, following the 1st extraordinary PRE auction (on 15 November), an hourly capacity of 120 MW was awarded, for the delivery periods Week 47 to Week 52 (from 22 November to 31 December), corresponding to a total volume of 115.2 GWh, attributable between 9 and 10 supplying market agents. The existence of the auction mechanism made it possible to provide the market with tools to cover the risk of energy supply (in volume and in price). The auction benefited from great interest from the market agents, with 9 to 10 contracting agents and 13 qualified bidders, always ensuring that the volumes of energy made available to the market are placed at auction closing prices that are always higher than the respective opening prices.

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

Since 1 January 2013[104], electricity tariffs for LV end-customers published by ERSE for mainland Portugal[105] have a transitional nature[106]. In 2021, these tariffs applied to MV, SpLV and StLV[107] supply delivered by the

[104] Under Decree-Law no. 75/2012, of 26 March.

[105] 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.

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

[107] Decree-Law no. 15/2015, of 30 January, changed Decree-Law no. 75/2012, of 26 March and has changed the way of establishing the application period of the respective transitional tariffs for electricity supply to StLV final consumers. The application period for the transitional tariffs to StLV final consumers was changed to 31 December of 2025 by Law no. 42/2016, of 28 December, Government Ordinance no. 39/2017, of 26 January, Government Ordinance no. 364-A/2017, of 4 December and Government Ordinance no. 83/2020, of 1 April. The application period for transitional tariffs for MV and LVE clients was changed to 31 December 2021 and 2022, respectively, by Government Ordinance no. 83/2020, of 1 April.

supplier of last resort. Transitional EHV and HV 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 2021 onwards were determined by the sum of network access tariffs, the transitional energy tariff and the regulated supply tariff[108], all approved by ERSE[109].

EXTRAORDINARY MEASURES IN THE ELECTRICITY SECTOR DUE TO EPIDEMIOLOGICAL EMERGENCY COVID-19

During 2020 and 2021, and in response to the international public health emergency declared by the World Health Organisation on 30 January 2020, as well as the classification of the virus as a pandemic, ERSE approved and published several regulations and instructions concerning the conditions for the provision of energy supply services as essential public services to consumers.

These measures covered the prohibition of interruption of supply decreed by the Government, and enabled staggering the payment of suppliers' bills and corresponding payment plans between network operators and suppliers.

Electricity customers who were in a situation of business crisis, namely regarding the total or partial closure of their economic activity, had the right to change the contracted capacity and energy terms to be billed.

Regarding suppliers, the possibility was given to request from the network operator an additional moratorium on the payment of network access costs, in the cases provided for in the regulations, as well as allowing the consolidation of commercial deviations. The deadline for reporting information to ERSE was also extended in the context of electricity labeling and quality of commercial service.

[108] The transitional tariff regime is determined by the joint application of Government Ordinance no. 108-A/2015, of 14 April, and Government Ordinance no. 359/2015, of 14 October. Order no. 7557-A/2017, of 25 August. It revoked Order no. 11 566-A/2015, of 3 October.

[109] Directive n.º 3/2020, of 17 February.

REGULATORY DEVELOPMENTS

TARIFF DEFICIT

In line with Decree-Law n. º 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 acquiring electricity from SRGs with guaranteed revenue pertaining to 2009.

In 2011, a new possibility was introduced to pass on the cost differentials associated with the purchase of energy from the SRG, based on a deferral of the portions which are passed on in the profits of the five following years, through the publication of Decree-Law n.º 78/2011 of 20 June, more specifically Article 73-A.º.

Decree-Law n. º 178/2015 of 27 August changed the inter-temporal transfer scheme in force. Its application was extended until 8 December 2020 in accordance with paragraph 8 of Article 73-A. º. In 2020, this mechanism was amended by Decree-Law n. º 79/2020, of 1 October, allowing the intertemporal transfer of the cost differential with the acquisition of energy to special regime producers to take place within a maximum period of five years until 31 December 2025.

The passing-on of cost differentials associated with the purchase of energy from the SRG is applied annually, as shown in the following table.

The final outstanding balance in 2021 of the main items of the electricity sector's tariff deficit is presented in Table 3-11.

Table 3-11 – Tariff deficit, 2021

	Outstanding debt in 2020 (10^3 EUR)
Tariff deficit 2009	390 117
2017 SRG additional cost deferral	225 217
2018 SRG additional cost deferral	465 447
2019 SRG additional cost deferral	571 283
2020 SRG additional cost deferral	1 104 615
Total	**2 756 679**

3.3 SECURITY OF SUPPLY

In the Portuguese legal framework, the responsibilities concerning security of supply in the electricity sector lie with the government, which delegated its monitoring tasks to the DGEG[110]. However, ERSE monitors the evolution of the installed capacity and the evolution of demand, which is addressed in greater detail below.

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

CAPACITY MECHANISM PAYMENT – INCENTIVE FOR INVESTMENT

The capacity mechanism payment was set out by Order n.º 251/2012, of 20 August, with amendments by Law nº42/2016, 28 December, which suspended the availability incentive for security reserve for thermal producers who are not in any of the situations outlined in Article 3 of Order n.º 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 n.º 264/2007, on 24 July, and of Order n.º 251/2012, 20 August, or those hydropower plants whose agreements fall within the scope of the implementation of the National Programme for Plants with Significant Hydroelectric Potential (PNBEPH), in compliance with Article 3 of Decree-Law n.º 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 n.º 233/2020, of 2 October, revoked Order n.º 251/2012, of 20 August, regarding incentives for 2020 for hydro 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 n.º 233/2020 sets out that the incentives for investment will still by 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

[110] In accordance with Decree-Law no 29/2006 of 15 February, as amended by Decree-Law no 215-A/2012 of 8 October, and with Decree-Law no 172/2006 of 23 August, as amended by Decree-Law no 215-B/2012 of 8 October.

issued by the Deputy Secretary of State and of Energy on 17 September 2020. The right to the incentive began in June 2018 and the dispatch also approved an amount of 1.9 million euros for that year. The amount for 2019, totally 3.1 million euros, was approved, adding 9 100 euros in interest to that amount.

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 Gouvães, Daivões e Alto Tâmega hydropower plants, currently under construction, 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.

SECURITY RESERVE

Decree-Law n. º 172/2006, of 23 August, 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. According to this Decree-Law, the definition or the terms of this mechanism are to be approved by an Order by the member of the government responsible for energy.

Later, through Order n.º 41/2017, of 27 January, and in accordance with the guidance of Law n.º 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 2021, the security reserve auction, under Order n.º 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 sector[111].

Thus, for 2021 availability contracts were not concluded for the security reserve regime and, consequently, the national electricity system incurred no cost.

[111] Portaria n.º 93/2018, of 3 April.

INTERRUPTIBILITY

According to the Regulation[112] currently in force, interruptibility refers to the ancillary system of voluntary self-reduction of electricity consumption by a consumer until matching the residual contracted capacity as a result of a downward instruction issued by the TSO. According to the prelude of Order n.º 592/2010, interruptibility allows:

a) a quick and effective response to emergency situations;

b) improvement of the flexibility of system operation; and

c) improvement of security of supply.

According to information released by the TSO for interruptibility services, from 1 November 2020 to 31 December 2021, 47 interruptibility agreements were registered and a total interruptible capacity of 655.5 MW was reached.

The remuneration for the provision of the interruptibility service, in the period between 1 November 2020 and 31 December 2021, represented around 117.7 million euros.

For the first time since its existence, automatic activation of the frequency-shedding relays existing in the facilities providing the interruptibility service was requested, following the incidents that occurred on the Spain - France interconnection lines on 7.24.2021, which led to the separation of the peninsula from the European synchronous network, with a frequency reduction to 48.68 Hz, below the trigger threshold of the installations providing the interruptibility service (49.2 Hz).

Order n.º 286-A/2016, of 13 October, defined that remuneration for the interruptibility services is limited to installations that have been subjected to the tests provided for in Article 4-A of Portaria n.º 200/2012, of 2 July, and which are considered capable of providing the service, after validation of the test results by ERSE and DGEG. All installations with active interruptibility agreements sucessfully passed the tests.

On October 29, 2021, Order nº 230-A/2021 was published, which revoked Order nº 592/2010, of July 29, and established the transitional regime to be in force until 31 December 2021, extending until the end of the 2021 the subscription contracts for the Interruptibility service active on 31 October 2021, putting an end to the interruptibility service.

[112] Portaria n.º 592/2010, of 29 July, with the subsequent amendments.

Ancillary Services

Taking into consideration the profound changes that have been occurring in the SEN, namely the decommissioning of coal power plants and the end of the interruptibility service, the TSO, under the provisions of Regulation (EU) 2017/2195 of the Commission Regulation (EU) 2017/2195 of 23 November 2017 setting out guidelines on balancing the electricity system, the need to supplement the SEN operational reserve with ancillary services, 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 ancillary services market, thus contributing to ensuring regularity and stability in the supply of electricity in the SEN.

The operation of the ancillary services 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 Very High Voltage (VHV), High Voltage (HV) or Medium Voltage (MV).

On 14 December 2021, the first competitive auction of ancillary services was held for the 8760 hours of the year 2022, with a demand required by the transmission network operator of 425 MW/hour at a reserve price of 20 €/MW/hour.

Within the scope of the auction process, 304.4 MW/hour of power relative to ancillary services, was adjudicated to 21 consumer installations, which corresponds to around 72% of the needs required by the transmission network operator, at an equilibrium price of 20€/MW/hour.

The ancillary services market has been operational since 1 January 2022, following the implementation of the ancillary services market auction.

3.3.1 MONITORING THE BALANCE BETWEEN SUPPLY AND DEMAND

The capacity margin, defined as the difference between installed capacity and the maximum load, in relation to installed capacity, decreased between 2020 and 2021 (to 49%), as a result of an increase in the consumption peak and a decrease in the installed capacity. Table 3-12 shows the evolution of installed capacity and peak load.

Table 3-12 - Capacity margin of the national electricity system

	2020 (MW)	2021 (MW)	Change (%)
Total installed capacity	**20 412**	**19 233**	**-5.78%**
Renewable capacity	14 042	14 680	4.54%
Non-Renewable	6 370	4 553	-28.52%
Maximum peak load	**8 906**	**9 888**	**11.03%**
Capacity margin	**11 506**	**9 345**	**-18.78%**
Capacity margin / Total installed capacity	56%	49%	

Source: REN data.

Table 3-13 presents total electricity consumption and its supply sources.

Table 3-13 - Consumption supply

	2020 (GWh)	2021 (GWh)	Change (%)
Total generation	**49 342**	**46 730**	**-5%**
Renewable generation	30 434	31 123	2%
Non-Renewable generation	18 908	15 607	-17%
Import balance	1 456	4 753	226%
Consumption of pumps	-1 986	-1 988	0%
Total consumption	**48 812**	**49 495**	**1.4%**

Source: REN data.

On the demand side, in 2021, total electricity consumption reached 49.5 TWh, with a 1.4% increase compared to 2020.

Table 3-14 shows the evolution of consumption by voltage level, excluding losses.

Table 3-14 – Evolution of consumption by voltage level

(GWh)	2018	2019	2020	2021
Very High Voltage (VHV)	2 366	2 344	2 461	2 282
High Voltage (HV)	7 036	7 072	6 792	6 826
Medium Voltage (MV)	14 987	14 939	13 916	14 416
Low Voltage (LV)	21 729	21 334	20 984	21 240
Total	**46 118**	**45 688**	**44 153**	**44 764**

Source: E-Redes

In 2021, hydrological conditions were unfavourable, with a hydrological index[113] of 0.93, which represented a slight decrease of this index compared to 2020. Hydropower plants[114] supplied 28% of electricity consumption, a value equal to the one of the previous year. Wind power generation had an increase from 24% to 28%, between 2020 and 2021, and the remaining renewable capacity technologies had quotas similar those in 2020.

Non-renewable thermal power plants represented, in 2021, a quota 33%, lower than the 38% recorded in 2020, with 1% of their generation coming from coal power plants and 31% coming from natural gas power plants.

In 2021, net import cross-border balance was 4 753 GWh or 9.6% of total consumption, which represented a significant reinforcement of the previous year importing tendency.

Table 3-15 presents the percentage breakdown of electricity generation by power source.

[113] Indicator quantifying the imbalance of the total value of hydropower produced during a given period, relative to what would be produced under average hydrological conditions.

[114] Including pumped hydro.

Table 3-15 - Breakdown of generation, 2020 and 2021

	2020	2021
Renewable Generation	**62%**	**67%**
Hydro	28%	28%
Wind	24%	28%
Biomass	7%	7%
Solar	3%	4%
Non Renewable Generation	**38%**	**33%**
Coal	4%	1%
Natural Gas	34%	31%
Other	0%	1%

Source: REN data.

Table 3-16 illustrates the evolution of the annual peak demand and its variation from 2017 to 2021.

The peak demand reached its maximum value, 9 888 MW, on 12 January 2021. Compared to the 2020 peak this shows an increase of 982 MW (11.03%), a higher increase than the one registered in the previous year.

Table 3-16 - Annual peak demand, 2017 to 2021

Year	Day	Peak (MW)	Variation (%)
2017	19-Jan	8 771	7.74
2018	7-Feb	8 794	0.26
2019	15-Jan	8 650	-1.64
2020	13-Jan	8 906	2.96
2021	12-Jan	9 888	11.03

Source: REN data

The evolution of the installed capacity at the end of each year is shown in Table 3-17.

Table 3-17 - Power generation capacity, 2020 and 2021

	2020 (MW)	2021 (MW)	Change (MW)
Renewable power plants	**14 043**	**14 680**	**637**
Hydro	7 215	7 222	7
Wind	5 246	5 368	122
Biomass	703	703	0
CHP	348	348	0
Solar	879	1 387	508
Non-Renewable power plants	**6 370**	**4 553**	**-1 817**
Coal	1 756	0	-1 756
Natural gas	4 586	4 525	-61
CHP	757	696	-61
Other	28	28	0
CHP	28	28	0
TOTAL	**20 413**	**19 233**	**-1 180**

Source: REN data

In 2021, the main developments that took place on the national electricity transmission network to ensure security of supply were:

- Conclusion of the following 400 kV power lines: Ponte de Lima - Vila Nova de Famalicão, Ribeira de Pena – Vieira do Minho, Castelo Branco – Fundão e Divor – Pegões;
- Entry into service of the new 400 kV axis Falagueira – Fundão and uprating to 400 kV of the Falagueira – Estremoz e Estremoz – Divor power lines;
- Construction of the following new substations: Ribeira de Pena 400/60 kV, Fundão 400/220 kV, Divor 400/60 kV e Pegões 400/60 kV;
- Construction of the new Viana do Castelo switching station, operated provisionally at 60 kV;
- Construction of a 220 kV panel at Santarém substation, a 150 kV panel at Falagueira substation and a 60 kV panel at Alqueva substation;

- Refurbishment of assets that reached the end of their expected economic lifetime, including the refurbishment of the existing 220 kV power line Carregado – Fanhões 2, and of the 150 kV power lines Porto Alto – Palmela 1 and Bouçã – Zêzere;
- Conclusion of refurbishment works on protection, control and automation systems installed at Vila Chã, Estoi e Alto Mira substations.

In terms of quality of supply, the transmission network recorded an Equivalent Interruption Time (EIT) of 0.05 minutes (see section 3.1.1.2).

Table 3-18 shows the total length of transmission and distribution networks (in continental Portugal and excluding LV network managed by exclusively LV operators), by voltage level.

Table 3-18 – Total length of transmission and distribution networks

(km)	2018	2019	2020	2021
Transmission network				
Very High Voltage (VHV)	**8 907**	**9 002**	**9 036**	**9 348**
Distribution Network	**226 531**	**228 046**	**229 167**	**230 676**
Hugh Voltage (HV)	9 543	9 568	9 574	9 607
Medium Voltage (MV)	73 547	73 814	74 110	74 380
Low Voltage (LV)	143 441	144 664	145 483	146 689

Source: REN, E-Redes

3.3.2 MONITORING INVESTMENTS IN GENERATION CAPACITY

In 2021, there were no significant developments concerning new investments in thermal generation capacity. On the other hand, the Sines and Pego generation units were decommissioned. Lastly, the Tapada do Outeiro generation unit is expected to be kept in operation until 31 December 2029. This expectation is supported by the Monitoring Report on Security of Supply in the National Electricity System for the period 2022 to 2040 (RMSA-2021), approved by the government in 7 October 2021.

In terms of hydropower generation capacity, there were also no developments in 2021. Within the scope of the implementation until 2030 of the PNBEPH, the RMSA-E 2021 considers the entry into operation of

Gouvães, Daivões and Alto Tâmega power plants in 2023, reaching a total of 1200 MW, 880 MW of which reversible.

In terms of other generation technologies, there was an increase of 122 MW in wind farms and an increase of 508 MW in solar capacity, the highlights being the new units of Alcoutim (200 MW), Nisa (50 MW), Morgado de Arge (45 MW) and Mogadouro (42 MW).

Regarding the predictions for the evolution of the installed capacity from renewable energy sources, the RMSA-E 2021 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 3-19.

Table 3-19 – Predicted evolution of renewable energies 2023, 2025 and 2030

	2023 (MW)	2025 (MW)	2030 (MW)
Hydro (< 30 MW)	7 548	7 548	7 548
Hydro (> 30 MW)	622	625	631
Wind	5 625	5 694	5 884
Solar	4 129	5 566	6 200
Biomass / Biogas	335	343	369
Urban Residues	77	77	77

Source: RMSA-E 2021 data

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 currently in force was approved by ERSE in 2021, adopting the transmission network compensation model provided for by the European Network Code[115] on gas balancing of transmission networks, and the European Network Code for interoperability and rules of data exchange[116].

The full implementation of the balancing model provided for in the European Network Code depended on the entry into operation of the gas trading platform with delivery in Portugal, assigned to the entity MIBGAS, S.A. The completion of the implementation of MIBGAS occurred in March 2021, allowing the balancing model through shares of purchase and sale in the market to be achieved during that year.

Until October, the balancing rules in force still provided for the use of balancing services by the technical manager of the system, in the form of gas purchase or sale auctions in a specific platform for this purpose. During 2021, the technical manager of the system used this balancing service 17 times, acquiring a total of 102 GWh at an average price of 24.3 €/MWh, between January and February 2021.

On 16 March 2021, the organised market for products with delivery at VTP - Virtual Trading Point, on the MIBGAS platform, went into operation. With this market platform, the GTG - responsible for balacing the gas transmission network - began to be able to perform balancing actions, through the purchase and sale of standard products (daily and intraday) on the market. Between May and November 2021, the technical

[115] Comission Regulation (EU) No. 2014/312, of 26 March

[116] Comission Regulation (EU) No. 2015/703, of 30 April

manager of the system also carried out a programme of purchases of filling and operation gas for the transmission network, totalling 330 GWh, to replace the gas from the agents that until then had fulfilled this function.

Although the completion of the purchase of the operation gas was in November, only on 19 January 2022 the technical manager of the system carried out the first balancing action in the organized market through intraday products traded in the continuous market.

Note that the level of stocks in the transmission grid may trigger balancing actions by the technical manager of the system in order to restore a balanced situation. These actions result from operations for the purchase or sale of standardized gas products on the wholesale market, for the following day or on an intraday basis. In this regard, ERSE approved, at the proposal of the technical manager of the system, a maximum limit per transaction for each balancing action, corresponding to 6 GWh. The volumes of gas to be constituted by the technical manager of the system were 330 GWh for filling the transmission network or linepack and for 60 GWh for optimizing the commercial management of the high pressure infrastructures, constituting the extension of the operation gas.

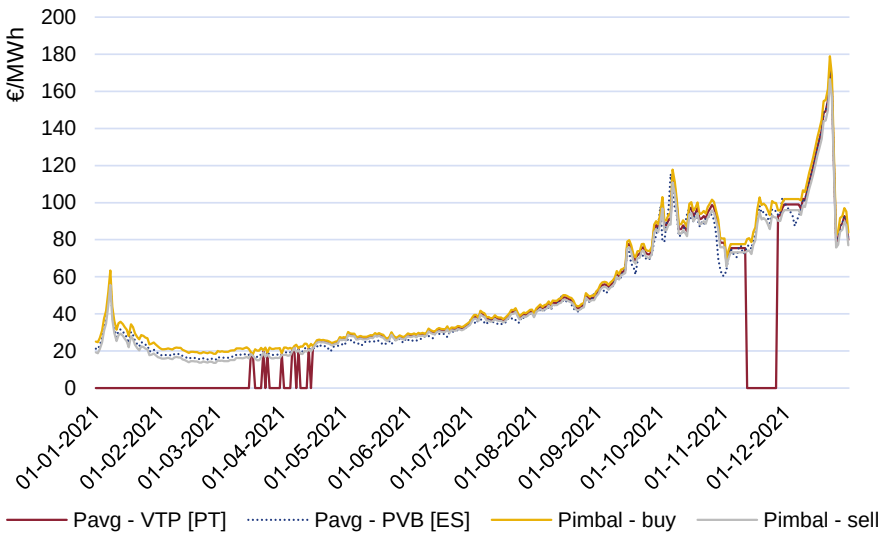
In addition to the gas transmission network balancing model, ERSE also approved a linepack flexibility service proposed by the transmission network operator[117]. This service offers network flexibility to market agents, partially absorbing the quantities subject to the application of imbalance prices. The service is allocated through specific auctions, with a reserve price. Significant premiums were achieved in the allocation of the service for the 2021-2022 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 4-1 shows the imbalance prices applied to market agents in 2021. The evolution of imbalance prices reflects the growth of wholesale gas prices.

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 2.5% until June 2021 and became 3% as of July. When there are no transactions at VTP for several days, the price reference for calculating the imbalance price becomes the price in Spain (PVB), affected by interconnection tariffs.

[117] The conditions for offering the linepack flexibility service for 2021-22 have been published by the TSO [

Figure 4-1 - Imbalance prices in the Portuguese balance area, in 2021



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

The 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 of the transmission network. The assignment of linepack flexibility margin to the market agents until September 2021 was done at no cost, bearing in mind that, transitorily, the technical manager of the system used (borrowed) gas quantities from market agents for the role of operational

reserve and filling gas[118]. However, since October, the new mechanism for assigning the linepack flexibility service was already applied. This new mechanism provides for a remunerated service, compatible with the European Network Code, attributed through standard products and competitive mechanisms. In the first instance of the allocation procedure of the annual linepack flexibility product, the service was highly sought after and was attributed with a premium of more than four times the reserve price.

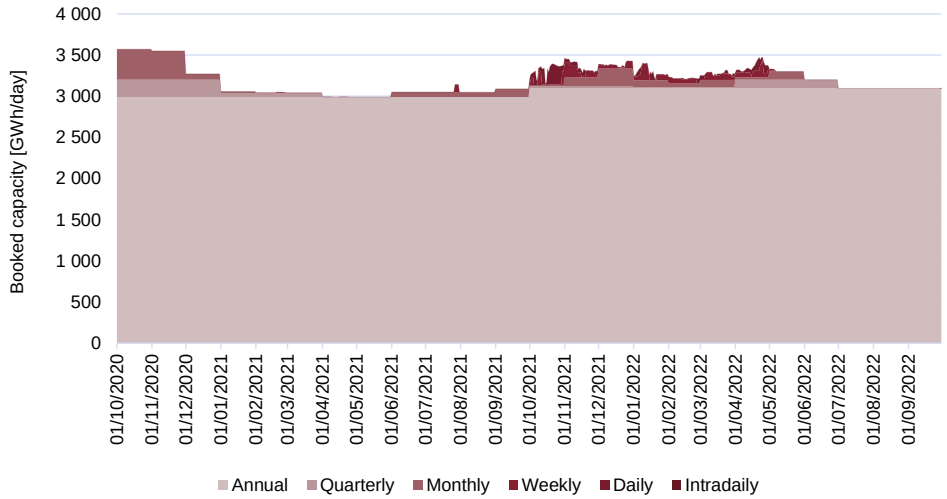
The underground storage facility of Carriço and the LNG terminal of Sines also benefit from a regulated third-party access regime. ERSE approves the capacity allocation mechanisms, integrated in the MPAI and the tariff scheme applied for this infrastructure.

ERSE continued to monitor the access conditions to the infrastructure that provide storage services, besides the transmission network. In 2021, the use of this infrastructure and the respective capacity contracts were again high. Consequently, the entry capacity from the LNG terminal (regasification) was entirely booked in the annual allocation process for the gas year 2021-2022. In addition, the average contracting of underground storage capacity during 2021 was 87%. Contracts for entry capacity into the transmission network from the international interconnection (Iberian VIP) saw a large decrease, mainly as a result of the end of GALP's long-term unbundled contract. The capacity contracting and congestion management procedures acted appropriately and ERSE monitored their application.

The following figure presents the evolution of underground storage contracting by market agents with predominance of the annual and quarterly capacity products. Note that from the year gas 2020-2021, the annual underground storage product became dominant in the contracting strategies.

[118] This situation was eliminated in October 2021.

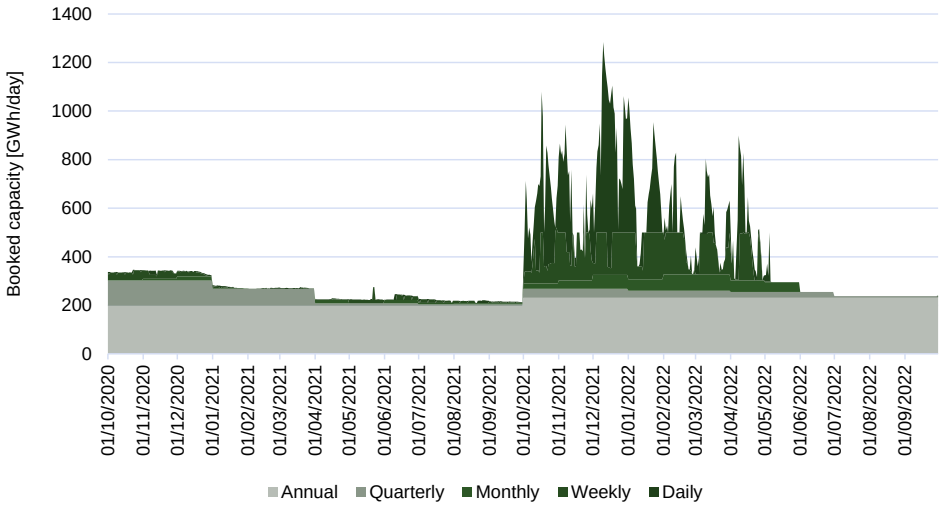
Figure 4-2 – Underground storage allocated capacity, by product



Source: REN Gasodutos data.

The two figures below show the allocated capacity in the LNG terminal, during the gas year 2020-2021 and a major part of the gas year 2021-2022. 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 2021 the terminal registered a record of 64 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 2021-2022.

Figure 4-3 – Allocated capacity in the commercial storage of the LNG terminal, by product

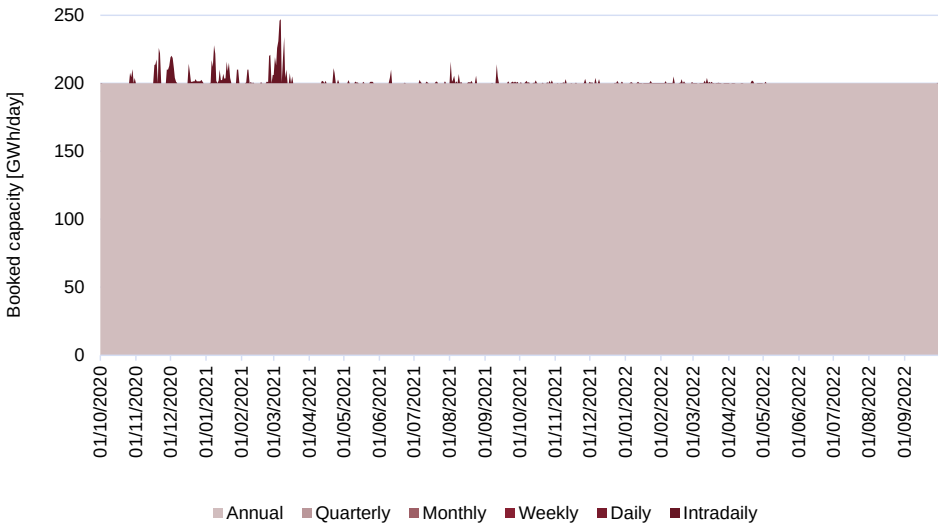


Source: REN Gasodutos data.

Figure 4-4 shows some punctual capacity contracting above the value of the commercially available capacity in the LNG terminal (200 GWh/d). This reality results from the approval in 2020 of an amendment

to the rules for capacity allocation that allow the offer of additional firm capacity, depending on the operating conditions of the LNG terminal at any given time and the offer of interruptible capacity. This optimisation of the capacity offered to the market is especially important in the current circumstances of full annual contracting at the LNG terminal.

Figure 4-4 – 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 infrastructure[119].

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 2021, the most significant aspects in terms of the performance of the LNG terminal were the following:

[119] i.e. DSOs, TSO, underground storage operator and LNG reception, storage and regasification terminal operator.

- The terminal supplied 7 522 LNG tanker trucks (an increase compared to the value recorded in 2020, which totalled 6 668 tanker trucks);
- The number of tanker trucks experiencing a delay in loading corresponded to 13% 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 64 unloading operations involving carriers (against 62 carried out in 2020);
- Seven delays were recorded in unloading of carriers; 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 2021, there were no interruptions of supply at transmission network exit points, as in the previous year.

In the distribution networks, as with the transmission network, performance is evaluated through indicators that consider the number and duration of interruptions. In 2021, there were no interruptions in 2 of the 11 existing distribution networks (Sonorgás and Paxgás) and only 0.9% of approximately 1.50 million customer installations suffered interruptions. Nearly 77% 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 2021, 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 2021, 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.

We should note that, in accordance with the RQS, ERSE publishes a quality of service report on a yearly basis[120], to present and assess the quality of service for the activities covered by the gas sector.

[120] Available at ERSE

4.1.1.4 REGULATIONS DEVELOPMENTS

REVISION OF THE REGULATIONS FOR THE GAS SECTOR

After the change in the legislation governing the organization of the natural gas sector, that was revised in 2020, by Decree-Law no. 62/2020, of 28 August, ERSE adapted and revised the sector's regulations to this new legislation. The reformulation of the regulations included the Quality of Service Regulation (RQS), the Regulation on Access to Networks, Infrastructure and Interconnections (RARII), the Infrastructure Operation Regulation (ROI) and its Global Technical Management Procedures Manual (MPGTG), and the Gas Sector Tariff Regulation (RT) [121]. A directive was also approved on the process of returning gas stocks from market agents to the operational reserve and the programme for the acquisition of operating gas by Global Technical Management[122].

One of the main features of the reformulation of regulations focused on the decarbonisation of natural gas networks, through the promotion of the injection of gases of renewable origin or low carbon content. The regulations included the technical (planning and operation of infrastructure) and commercial (access to networks and commercial relationship) aspects of gas injections into the networks.

Another pillar of the review was the full adoption of the European Gas Transmission Network Compensation Network Code [Commission Regulation (EU) No. 312/2014 of 26 March 2014].

IMPLEMENTATION OF THE TRANSMISSION BALANCING MODEL ESTABLISHED IN THE EUROPEAN NETWORK CODE

As mentioned in the previous section, the regulation of the gas sector was amended, among other reasons, to complete and complete the adoption of the European Network Code for gas transmission network balancing [Commission Regulation (EU) No. 312/2014 of 26 March 2014]. Part of the completion of this network code was pending the existence of a trading platform for natural gas at the Portuguese balancing point. This issue was overcome on 16 March 2021, with the start of trading of gas products with delivery in the Portuguese system on the MIBGAS platform. The end of the transitional measures that had been in application since 2016 and a transition mechanism for operating gas were thus determined. This mechanism included the return of the gas reserves of the market agents used by the system manager for

[121] Regulation n.º 406/2021, de 12 de May (RQS), Regulation n.º 407/2021, de 12 de May (RARII), Regulation n.º 341/2021, de 14 de April (ROI), Directive n.º 9/2021, de 12 de May (MPGTG) e Regulation n.º 368/2021, de 28 de April (RT).

[122] Directive n.º 6/2021, de 15 de April (Return of stocks and acquisition of filling gas from RNTG).

system balancing and filling the transmission network and their replacement with gas from the transmission network operator itself, acquired over a 6-month period through daily and intraday product auctions.

After the transition period, which ended in November 2021, the transmission system operator now carries out the compensation of the transmission system under the terms of the network code, using balancing actions carried out in MIBGAS and, complementarily, a compensation service approved by ERSE to allow this compensation at times when the market does not offer compensation gas in the required quantity. Imbalance prices reflect the costs of balancing actions.

LINEPACK FLEXIBILITY SERVICE

As a complement to the new gas transmission network compensation model, ERSE approved a linepack flexibility service proposed by the transmission network operator[123]. The new mechanism, which replaces the previous one, offers network flexibility to market agents, in the form of the buffering of 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 2021-2022 gas year, showing great interest by the agents in the service.

PILOT PROJECT ON HYDROGEN INJECTION IN THE DISTRIBUTION NETWORK

In 2020, ERSE approved the launch of a pilot project for hydrogen injection in distribution networks, proposed by a gas DSO (Setgás in Seixal), with the aim of testing the requirements and solutions for hydrogen injection in gas networks with different blending percentages. The pilot project called the "*green pipeline*[124]" has experienced implementation delays, but is expected to start in 2022.

REGIME FOR MANAGEMENT OF RISK AND GUARANTEES

The management of risks and guarantees within the scope of the regulated sectors is of significant importance for ERSE, namely because of the fact that economic and reputational costs may affect the functioning of the market, in the electricity sector and in the gas sector, or jointly in the two sectors, as can happen with the commercialization of energy.

[123] The conditions for offering the linepack flexibility service for 2021-22 have been published by the TSO [link].

[124] https://www.greenpipeline.pt/

With the publication of Decree-Law No. 76/2019, of 3 June, which changed the legal regime applicable to the exercise of electricity production, transport, distribution and commercialization activities and to the organization of electricity markets previously established in the Decree-Law No 172/2006, of August 23, the legal existence of an integrated risk and guarantee management system within the scope of the National Electricity System (SEN) was established, expressly providing for the figure of the integrated guarantee manager and the adoption of rules for prudential management.

In addition, Decree-Law No. 62/2020, of 28 August, which establishes the organisation and functioning of the National Gas System and the respective legal regime, establishes the same regime, this time for the gas sector.

With the publication of Directive no. 2-A/2020, of 14 February, the risk and guarantee management model for the electricity sector was legally implemented, the definition of which was preceded by a widely participated public consultation. Moreover, in the context of this consultation, it was possible to verify the interest expressed by several agents in the possibility that the regime, at the time proposed only for the electricity sector, could be extended to the gas sector.

The advantages of being able to approach an integrated system of risk management and guarantees that covers both sectors are widely recognised. Firstly, the possibility of being able to better ensure that commercial relationships take place in a context of integrity and security for the market and for the National Electricity System and the National Gas System. On the other hand, in the case of activities and agents that can cover both sectors – trading, in particular – the integrated approach to risks and guarantees not only allows the strengthening of market integrity conditions, but also allows a more efficient operation of the costs supported by these agents.

The operating model, both of the National Electricity system and the National Gas System, is based on the exercise of access to networks and infrastructure to achieve the free establishment of commercial relationships between market agents. This access can take place through the suppliers in relation to the consumers constituted in their respective portfolios - through the respective supply contract settled between them -, as well as through direct access in the case of market agents (for example, end customers who wish to purchase energy directly in organised markets or in bilateral contracts). In both cases, between the network or infrastructure operator and the agent providing access to the networks or infrastructures, there is a Network Usage Agreement (ContUR), which establishes the rights and obligations of both parties, and the obligations imposed on the user counterparty to settle the respective charges (to the network operator or infrastructure operator) are considerable, with the use being prior to payment.

On the other hand, it is also important to take into account that the constitution of an entity as a market agent requires the signing of an adhesion contract, within the scope of the system management activity, to be established between market agents, including producers, and the entity in charge of managing the system.

It is important to remember that the multiplicity of economic agents operating in the National Electricity System and the National Gas System had already resulted in the occurrence of four situations of non-compliance within the framework of the National Electricity System and another two in the case of the National Gas System (but with less expression than those registered in the electricity sector). These situations have serious consequences in terms of the charges they create for consumers as a whole and in terms of the commercial discontinuity they entail for consumers specifically affected by these situations.

In this context, ERSE put to public consultation a model of rules for the management of risks and guarantees, now applicable jointly to the National Electricity System and the National Gas System. These rules are aligned with the legal context of both sectors, and are based on the regulatory framework adopted in the electricity sector (through Directive No. 2 A/2020) and the experience gathered in the meantime, which culminated in the approval of Directive No. 7/2021,[125] of 15 April. These rules maintain and reinforce the characteristics of risk differentiation according to the real performance of economic agents, organise in a more effective context an integrated and integrative action of risks, also allowing the segregation between the operation in the context of risk and guarantee management and the commercial transaction underlying the provision of guarantees.

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 sale to end-customers, the network and infrastructure access tariffs and also the prices for regulated activities.

The network and infrastructure access tariffs in place in 2021 result from the rules approved by the 2019 gas regulatory review. Prior to each regulatory period, ERSE usually reviews its Codes, and in particular the

[125] Directive no. 7/2021, estalishing a regime for the management of risks and guarantees in the National Electricity Systm (SEN) and National Gas System (SNG).

RT, since ERSE considers it is the adequate moment to evaluate the parameters and the methodologies for revenues and tariffs, which guide the Regulator's activity, as well as to evaluate the impact of the measures taken and their realisation, namely through the performance of the regulated companies and the impact of regulated tariffs on the market. The revision of the RT, linked to 71 ERSE Public Consultation, took place in the final year of the regulatory period between 2016 and 2019, integrating the necessary improvements identified during the application of the RT, as well as the substance which defined the new regulatory period which began in January 2020.

The RT for the gas sector applicable in 2021 was approved by the Regulation no. 368/2021, of 28 April.

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

In the natural gas sector, there are several regulated activities, the allowed revenues of which are established by ERSE and 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, Energy and Commercialisation.

Underlying the principle that the services that are associated with each regulated activity must be identified, ERSE defines the physical variables most suited to the valuation of the charges effectively caused by the service provided to each client. This set of physical variables and the corresponding metering rules are the billable elements for each one of the tariffs.

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

The prices of the network access tariffs for each billing variable are obtained by adding the corresponding prices of the tariffs per activity. To the extent that 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 makes it possible to know in detail the various tariff components by activity. Thus, each customer may 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 the consequence of the implementation of such a system, allows 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 due 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.

As regards 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 sale to end-customers. General speaking, these tariffs are paid by suppliers on behalf of their customers[126]. As regards 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 access to networks and of infrastructure tariffs and the corresponded billing variables.

Table 4-1 - Structure of the tariffs which comprise the gas network access and of infrastructures 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		●	●	●
Switching Logistic Operation tariff	Fixed term		●	●	●
	Capacity	●			

⊙ - Depends on the tariff's option

Source: ERSE data

[126] 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 infrastructure 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 TARIFFS PRICES

The network access tariffs in force from January to September 2021 correspond to the approved tariffs for the gas year 2020-2021[127] and from October to December 2021, to those approved for the gas year 2021-2022[128].

In 2019, due to the changes in the methodology related to the structure of the use of the transmission network tariff, 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 validity of the tariffs (previously they applied from 1 July to 30 June) was amended to cover the period 1 October to 30 September of the next year.

For the gas year 2021-2022 the networks access and infrastructure tariffs, as regards the forecasted demand for that year, evolved as shown in Table 4-3 and Table 4-4.

[127] Published through Directive no. 11/2020 of 25 June, amended by The Rectification Declaration no. 549/2020 of 11 August.

[128] Published through Directive 12/2021 of 29 July.

Table 4-3 – Tariff evolution for high-pressure infrastructure, the use of networks and the global use of the system for the gas year 2021-2022, by activity

Tariffs per activity	Average price 2020-2021 (EUR/MWh)*	Average price 2021-2022 (EUR/MWh)	Change
Use of the LNG Terminal (Sines)	0.56	0.37	-33.3%
Use of the Underground Storage	6.98	5.28	-24.4%
Use of the Transmission Network	0.54	0.45	-15.8%
Use of the Distribution Network	8.13	8.02	-1.4%
Global Use of the System	0.43	0.27	-38.1%
OLMC	0.01	0.00	-40.1%

* Application of 2020-2021 tariffs to the demand forecasted for 2021-2022.

Source: ERSE data

Table 4-4 – Tariff evolution for network access for the gas year 2021-2022, by type of client at each pressure level

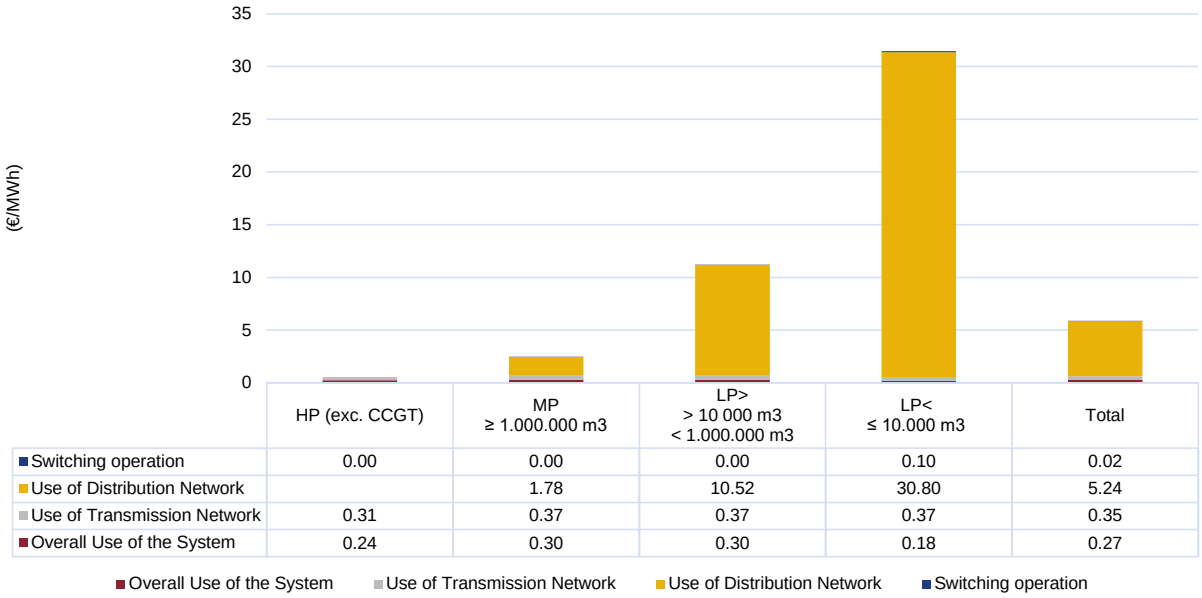
Network access tariffs per pressure level	Average price 2019-2020 (EUR/MWh)*	Average price 2020-2021 (EUR/MWh)	Change
Power Plants	1,02	0,69	-32,2%
High Pressure Customers	0,75	0,53	-28,8%
Medium Pressure Customers	2,55	2,45	-3,9%
Low Pressure Customers with an annual consumption above 10,000 m^3	11,41	11,19	-1,9%
Low Pressure Customers with an annual consumption lower than or equal to 10,000 m^3	32,16	31,45	-2,2%

* Application of 2020-2021 tariffs to the demand forecasted for 2021-2022.

Source: ERSE data, Note: high pressure (HP), medium pressure (MP), low pressure (LP)

The following figures show the breakdown and the 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.

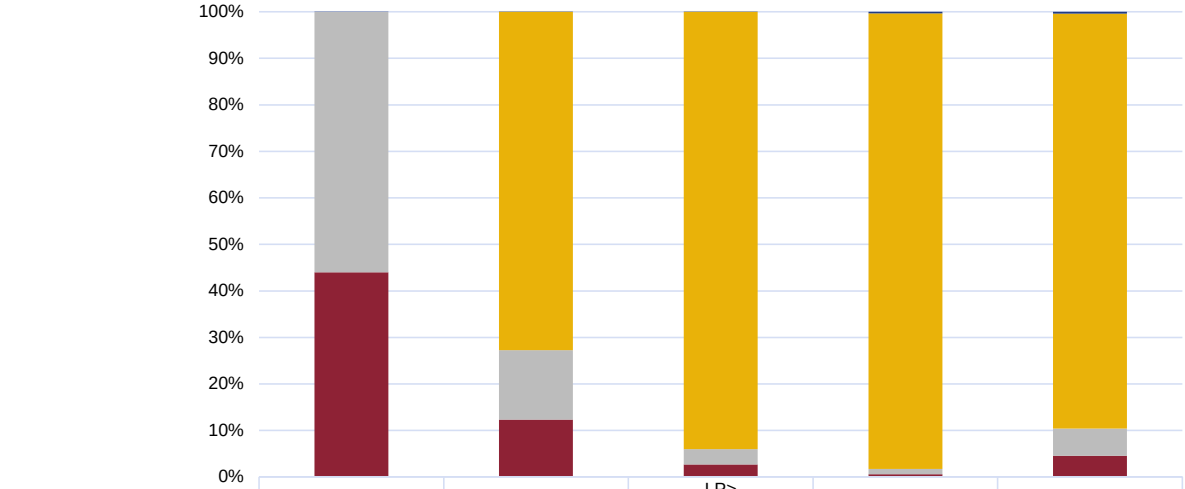
Figure 4-5 – Breakdown of the average price of network access tariffs, in the tariff year 2020-2021



	HP (exc. CCGT)	MP ≥ 1.000.000 m3	LP> > 10 000 m3 < 1.000.000 m3	LP< ≤ 10.000 m3	Total
Switching operation	0.00	0.00	0.00	0.10	0.02
Use of Distribution Network		1.78	10.52	30.80	5.24
Use of Transmission Network	0.31	0.37	0.37	0.37	0.35
Overall Use of the System	0.24	0.30	0.30	0.18	0.27

Source: ERSE data

Figure 4-6 - Structure of the average price of network access tariffs, in the gas year 2021-2022



	HP (exc. CCGT)	MP ≥ 1.000.000 m3	LP> > 10 000 m3 < 1.000.000 m3	LP< ≤ 10.000 m3	Total
Switching operation	0.0%	0.0%	0.0%	0.3%	0.4%
Use of Distribution Network		72.7%	94.0%	97.9%	89.4%
Use of Transmission Network	56.0%	14.9%	3.3%	1.2%	5.9%
Overall Use of the System	44.0%	12.3%	2.7%	0.6%	4.6%

Source: ERSE data

REGULATORY METHODOLOGIES FOR DETERMINING ALLOWED REVENUES

2021 was the second year of the current regulatory period, which runs from 2020 to 2023. As mentioned in the previous report, this period coincides with the civil year and not with the gas year. The regulatory models applied to each of the regulated activities are summarized below:

- Reception, Storage and Regasification of LNG: i) application of a price cap[129] methodology for operational costs (OPEX[130]) and accepted costs on an annual basis methodology for CAPEX[131]; ii) the application of a mechanism to ease tariff adjustments that recognises positive externalities for the entire SNGN associated to these activities; iii) mechanism for reverting to the tariffs the amounts received in relation to the premiums from the capacity allocation auctions.
- Underground Storage: i) price cap[132] methodology for OPEX regulation and accepted costs on an annual basis methodology for CAPEX; ii) the application of a mechanism to ease adjustments to allowed revenues, as in the Reception, Storage and Regasification of LNG; iii) mechanism for reverting to the tariffs the amounts received in relation to the premiums from the capacity allocation auctions.
- Natural Gas Transmission: i) application of a price cap[133] methodology for operational costs (OPEX) and accepted costs on an annual basis methodology for CAPEX; ii) a mechanism to mitigate the effects associated with the volatility of demand in terms of authorised revenues recoverable via the

[129] The cost driver that determines the evolution of revenue recoverable by application of the respective tariff is re-gasified energy.

[130] *Operational expenditure*

[131] *Capital expenditure*

[132] The cost driver that determines the evolution of revenue recoverable by application of the respective tariff is extracted/injected energy.

[133] The cost driver that determines the evolution of revenue recoverable by application of the respective tariff is the capacity used in commercial point.

application of the tariffs; iii) mechanism for reverting to the tariffs the amounts received in relation to the premiums from the capacity allocation auctions.

- Global Technical System Management: application of a revenue cap incentive methodology for operational costs (OPEX) and accepted costs on an annual basis methodology for CAPEX.
- Switching operator (OLMC): application of a revenue cap methodology for operational costs (OPEX) and accepted costs for CAPEX.
- Natural Gas Distribution: price cap[134] methodology for OPEX and accepted costs methodology for CAPEX;
- Suppliers of Last Resort: price cap[135] methodology plus remunerated working capital. Concessionary 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 the retail commercialization activity.

The annual efficiency factors applied to OPEX were (i) 2% in the reception, storage and regasification of LNG; (ii) 3% in transmission activity; (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 during this regulatory period, a principle of acceptance of investments differentiated in terms of remuneration was introduced, 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.

Attention should also be placed on the methodology that is being used for indexing the cost of capital, which enables the evolution of the economic and financial context to be reflected, thereby compensating own and other capital[136]. Therefore, the remuneration rates are updated based on the yields on Treasury Bonds. Given the volatility of the market indicators, a cap and a floor were established.

[134] The cost drivers that determine the evolution of revenue recoverable by application of the respective tariff are distributed energy and supply points.

[135] The cost driver that determines the evolution of revenue recoverable by application of the respective tariff is average number of customers.

[136] For 2021, the asset remuneration rates were the following: high-pressure activities – 4.50%; distribution activities – 4.70%.

CONTESTATION OF TARIFF DECISIONS

As regards appeals against a decision or methodology used by the regulatory authority, under the terms of Article 41(1) of Directive 2009/73/EC, reference should be made to the legal actions filed by the natural gas distribution system concessionaires against ERSE, challenging annually the tariffs and prices relating to the use of the distribution network in medium and low voltage since 1 July 2010. These lawsuits have been contested by ERSE and are currently before the competent administrative court, with no decision to date.

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, having not been subject to changes during 2021.

The established commercial conditions 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 applicability in the specific case.

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 provision of information, as briefly explained below.

Thus, in relation to third party access, the TSO is required to provide a network connection to whoever requests 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 m^3 (n), as well as installations located within the area of influence of the respective network, defined as the geographic area in the proximity 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 infrastructure that enable the connection of a natural gas facility to the network, classified as network to build or distribution branch. The construction of connecting elements is a network operators' obligation although, the petitioner may assume that responsibility. Once built, the connecting elements will form an integral part of the networks, as soon as they are deemed by the operator to be in proper technical operating conditions.

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 form part 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 regulation requires network operators to send information to ERSE, on a half-yearly basis, on the number of connections established, 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 laid down in RARII and MPAI, which are approved by ERSE.

The RARII integrates the principles established in Regulation (EU) no. 2017/459 of 16 March 2017, 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.

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 Point[137] that aggregates the two physical

[137] VIP, or *Virtual Interconnection Point,* is the aggregation of all international interconnection points in a single virtual point, on which is processed the booking and identification of the crossing capacity between Portugal and Spain.

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 PRISMA[138] platform. Non-bundled capacity, in particular exit capacity to Spain, in the Iberian VIP, is allocated in the national platform, operated by OMIP.

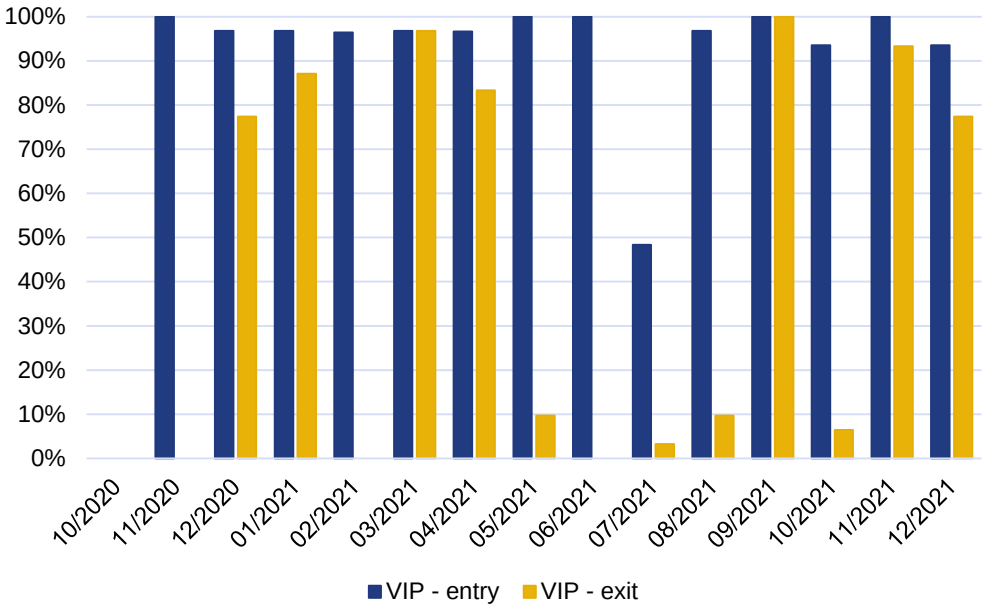
With regard to capacity allocation and congestion management mechanisms at the Iberian VIP, the MPAI establishes: (i) the offer of intraday capacity products in the interconnections; (ii) the implementation of the mechanism for capacity surrender by market agents applied to monthly capacity products; (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 2012, following the amendment of Annex I 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 technical manager of the system, 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 2021, the implementation of the harmonised methodology of overbooking and buy-back in the Iberian VIP resulted in the availability of an overcapacity on 340 days, in the direction of Spain to Portugal, and 173 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 12.9 GWh/d and 8.4 GWh/d, in the mentioned directions.

The following figure shows the capacity offered in this way.

[138] www.prisma-capacity.eu

Figure 4-7 – Monthly percentage of days with firm capacity offer on the Iberian VIP, by means of the oversubscription and buy-back mechanism, since October 2020



Source: ENTSOG

ERSE approved in 2020, with effect from gas year 2020-2021, the methodology for the joint application of the mechanism for the loss of the long-term unused capacity reserve (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.

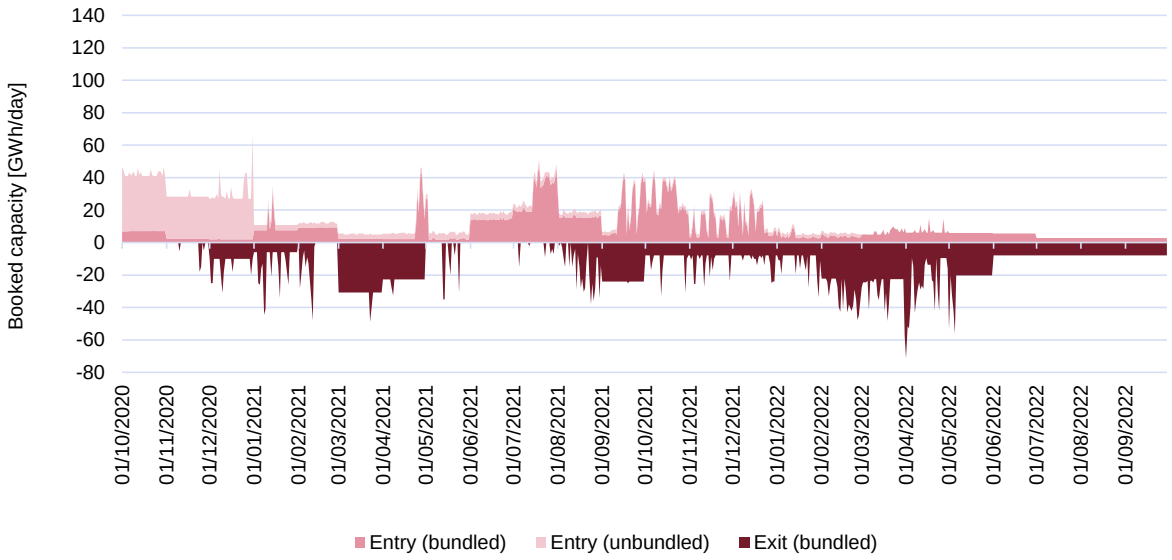
ACCESS TO INTERCONNECTIONS

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 is contracted in a bundled manner, with only a small part allocated in Portugal as unbundled capacity. Since March 2022, the contracting of capacity in the Iberian VIP is fully bundled.

In 2021, there were no situations where demand for capacity in the VIP exceeded supply, due to a higher usage of the LNG terminal of Sines as a source of supply for the Portuguese market. The contracting of

capacity in the export direction (from Portugal to Spain) grew significantly and remained the trend in early 2022. The following figure shows the bundled and unbundled capacity in 2021, allocated on the PRISMA platform.

Figure 4-8 – Bundled or unbundled allocated capacity in the interconnection (Iberian VIP), by product



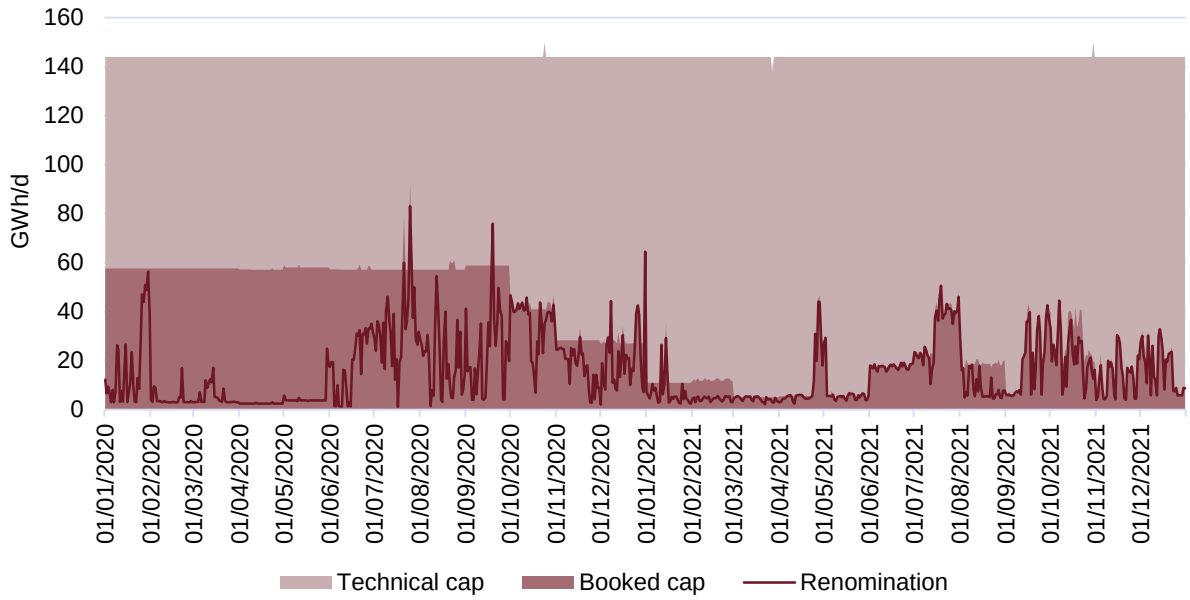
Source: REN Gasodutos data.

The following two figures show the capacity reserve in the Iberian VIP, compared to the identification submitted by the market agents and the maximum technical capacity offered in the VIP, either in the direction of import (inbound) or export (outbound).

In 2021, the main historical long-term contract with Algeria (from GALP), via Morocco, ceased, as well as the output capacity contract (non-grouped/unbundled) on the Spanish side. Thus, in 2021, there was a change in behavior in the contracting and use of capacity in the Iberian VIP, reducing the contracting of capacity, but significantly increasing the use of capacity contracted by appointments.

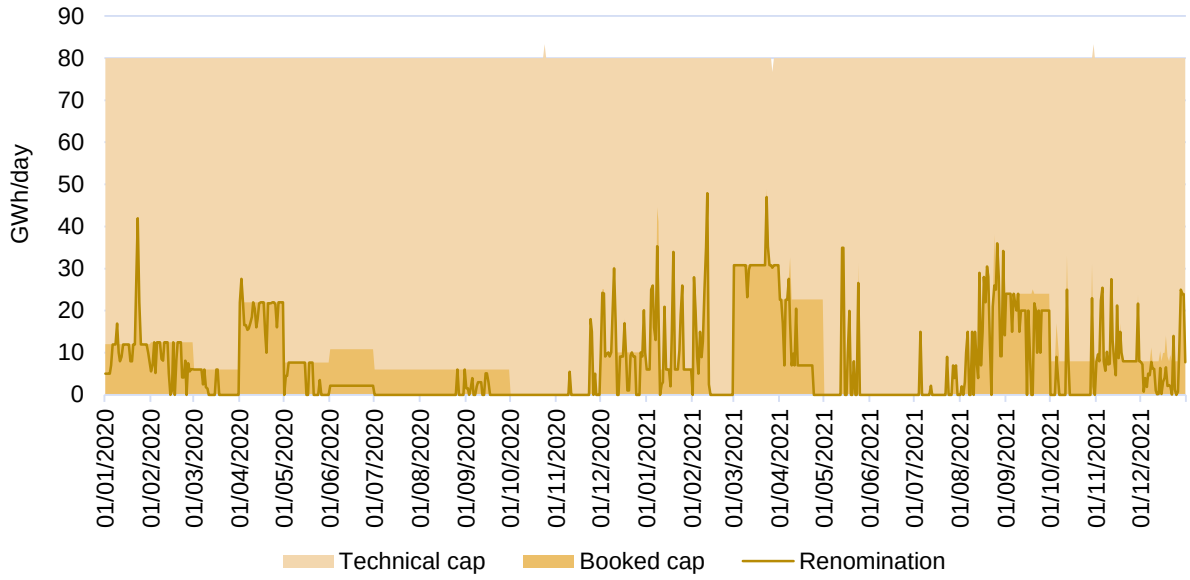
In the exporting direction, 2021 accentuated the trend towards greater use of interconnection capacity. Contracting was mainly in short term products, allowing agents to optimise the use of the contracted capacity.

Figure 4-9 – Contracted capacity and bookings in the Iberian VIP in 2021 (import)



Source: ENTSOG

Figure 4-10 – Contracted capacity and bookings in the Iberian VIP in 2021 (export)



Source: ENTSOG

COOPERATION

The Portuguese and Spanish TSOs have been cooperating closely with each other 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

In compliance with the provisions of Article 87(1) of Decree-Law N.º 62/2020 of August 28, 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 2022-2031 (PDIRG 2021).

According to Article 87(2) of the same Decree-Law, ERSE has 22 days to launch a public consultation, lasting 30 days, with the subsequent 22 days to prepare the respective report that, together with the contributions received and within the same period, was submitted to DGEG and the RNTG operator.

ERSE submitted the PDIRG 2021 proposal for public consultation, from 3 May to 15 June 2021.

ERSE's assessment of the PDIRG 2021 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, on 28 August, a globally positive Opinion.

Considering that it is essential to guarantee the reliability of the infrastructures operation and the quality of service of the gas sector, maintaining the recommendation to postpone everything that is not fundamentally necessary, ERSE did not identify any reason for not issuing a Final Investment Decision (FID) for the set of the "Base Projects" proposed and associated, on the one hand, with the Global Technical Management (7.1 M€) and, on the other hand, with the "remodeling and modernisation" of the RNTG infrastructure, the underground storage Carriço and the Sines LNG Terminal (38.7 M€), with a total investment of €45.8 million euros.

After analysing the investment projects presented and the comments received in the public consultation, it was found that the PDIRG 2021 proposal presented a set of studies and projects linked to the National Strategy for Hydrogen, EN-H2, which correspond to an amount of 39.6 million euros expected to be implemented between 2022 and 2026. Despite the importance that these projects may eventually have, ERSE proposed, if it proved to be not possible to achieve a more adequate level of detail and reasoning, the postponement of its analysis in the FID.

In the process of monitoring the 5th List of Projects of Common Interest (PCI), led by the European Commission and in which ACER participated jointly with the regulators, several activities were carried out, among which the verification of consistency between ENTSOG's Ten-Year Network Development Plan 2022 and PDIRG 2021. It should be noted that the 5th PCI List, approved by the European Commission on November 19, 2021, does not contain any project for the National Gas System.

Development and Investment Plans for the Natural Gas Distribution Networks

As established by Article 12-B of Decree-Law N.º 140/2006, of July 26, the natural gas distribution system operators must issue, every even year, five-year proposals for the Distribution Network Development and Investment Plans (PDIRD-GN).

In line with Article 12-C (1) of Decree-Law N.º 140/2006, the 11 natural gas distribution system operators[139] submitted to DGEG their PDIRD-GN proposals for the 2021-2025 period.

In turn, after requesting changes from the various distribution system operators, DGEG sent to ERSE those proposals, on 28 July and on 13 August 2020. ERSE, pursuant to Article 12-C (5) of Decree-Law N. º 140/2006, must hold a public consultation on its content, lasting 30 days. The consultation took place between 25 February and 9 April 2021.

ERSE's assessment of the 2020 PDIRD-GN Proposals, 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 issue, on May 24, an overall positive Opinion.

ERSE stressed that in the current framework of energy transition, the development of an integrated vision of the energy sector is essential. The contribution of gas to the transition towards a carbon-neutral society

[139] Beiragás, Dianagás, Duriensegás, Medigás, Lisboagás, Lusitaniagás, Paxgás, REN Portgás Distribuição, Setgás, Sonorgás and Tagusgás.

in 2050 will have to be agreed upon, so that coherence is ensured between the investment proposals of the different DSOs, which guarantees an adequate evolution of the gas networks, compatible with the carbon neutrality goal.

In addition to the 182.8 million euros approved in the PDIRD-GN 2018, to be implemented in the period 2021 to 2023, the PDIRD-GN 2020 proposals provided an additional investment of 184.3 million euros in the period 2021 to 2025. If approved, this additional investment will amount to 367.1 million euros for the gas distribution networks in the five-year period from 2021 to 2025.

The majority of participants in the public consultation expressed opinions that recommend caution regarding the approval of the investment volume foreseen by the DSOs for the expansion of networks, since this expansion is only focused on a strategy of increasing the number of domestic customers. These projects, to be approved and implemented in the next five years, will have a depreciation period that, in many cases, will exceed 30 years. This means that the decisions taken now will have tariff consequences, which will have repercussions beyond the time horizon of 2050.

ERSE considered that this perspective should be assumed by the DSOs when they prepare the final version of the PDIRD-GN 2020 proposals, to be submitted for approval following the opinion issued by ERSE. It should also be assumed when drafting the future PDIRD-GN proposals, which should now include a chapter which explicitly demonstrates how DSOs are committed to ensure that:

i) Future situations of idle assets and, consequently, of possible “sunken costs” for the energy sector are minimised.

ii) Assets which are relevant and valuable for the future of the energy sector, guarantee reasonable and accessible prices for natural gas consumers, today and in the short/medium term, are maximised.

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

Negotiation in the MIBGAS[140] platform for intraday, daily and weekend products with Portuguese delivery started on 16 March 2021.

The launch of the negotiation, on the same platform used by Spain and with very similar rules compared to deliveries in that country, was an important step towards the development of Portugal's natural gas market and integration with its neighbouring country. This development follows the future perspective of additional market integration mechanisms, namely of implicit interconnection capacity attribution in a context of common rules for both countries which will foster a more robust and transparent price formation.

Negotiation during 2021 continued at low levels. It was mainly concentrated on the regular cushion and working gas purchases by the Global Technical Operator that took place until November.

As Portugal is not a natural gas producer, negotiation and procurement constitute the first segment of the sector's value chain. In this context, the Portuguese market is supplied with natural gas through entries into the system via the interconnection with Spain (Campo Maior and Valença) and the port terminal at Sines (LNG terminal), with long-term contracts still existing.

The supply of natural gas through the interconnections (about 3% in 2021) is made from Spain. These volumes are essentially associated with Argelia pipeline imports.

Supply through the LNG terminal is to a large extent based on LNG agreements with Nigeria that include a take-or-pay clause. This contract follows price rules defined in the contracts, and envisages an annual volume of approximately 3.42 bcm. In 2021, nearly 97% of the natural gas was supplied through LNG.

[140] Entity recognised by the Portuguese government, through Portaria n.º 643/2016, 21st August, as the organised gas spot market operator.

Other agents of lesser importance in the Portuguese market supply natural gas from Spain, (where there is a liquid wholesale market, with supplies from Algeria, Nigeria, Trinidad and Tobago, Egypt, Qatar, Oman, Norway, Libya, Equatorial Guinea, Russia, United States and others) and also through the entry of carriers through the Sines LNG terminal.

TRANSPARENCY

Although a process is underway to implement transparency and integrity rules at 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 the operation of the market is still scarce. However, the reporting of transactions and trading orders associated with contracts negotiated in organised market platforms 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 Article 8(2) and Article 8(6) of the REMIT.

The trading of spot products with Portuguese delivery only started on 16 March 2021. This is understood as a necessary step towards the creation of a price reference for gas transactions in Portugal and to record both spot and future negotiation volumes. Nevertheless, the small market liquidity, which worsened after the cushion and working gas regular purchase programme by the Global System Operator ended, makes it difficult to establish a reliable and consistent price reference.

The reporting of transactions and trading orders, associated with contracts regarding the transmission of natural gas concluded following an explicit primary capacity allocation by the TSO and contracts negotiated outside the organised market platforms across the entire European Union, began on 7 April 2016, in accordance with the schedule laid down in Article 12 of Commission Implementing Regulation (EU) n.º 1348/2014, as well as other relevant market information relating to the use of LNG and natural gas storage infrastructures and to the loading and unloading operations by methane carriers.

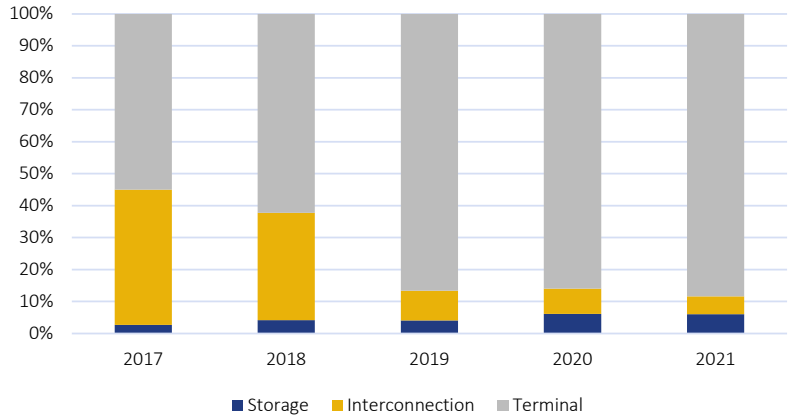
As the information on the transactions includes, in itself, commercially sensitive information, it is clear that, in the regulatory context, one can foresee mechanisms which, on the one hand, ensure the protection of commercially sensitive information and, on the other hand, provide the conditions for the integrity of the market and its transparency.

ERSE's 2016 regulatory review of the natural gas sector incorporated specificities related to the application of REMIT.

NATURAL GAS SUPPLY

The breakdown of natural gas injections in the transmission grid is described in Figure 4-11 .

Figure 4-11 – Breakdown of transmission grid injections by infrastructure, 2017 to 2021

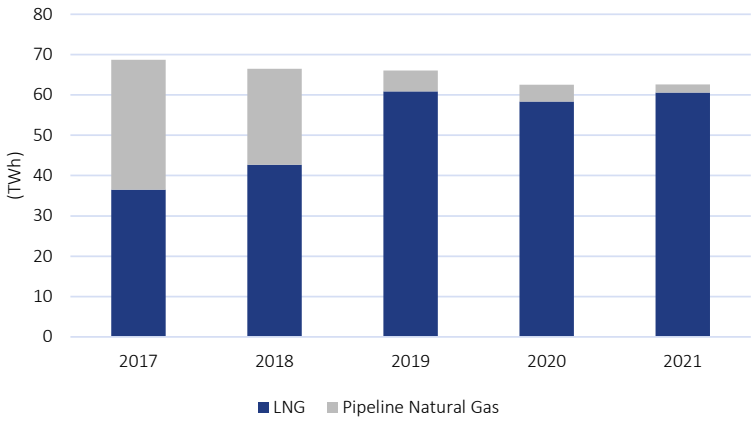


Source: REN Gasodutos, REN Armazenamento, and REN Atlântico data

Since 2017, the Sines Terminal has increased its relevance as the main supply route, accounting in 2021 for approximately 88 % of the total contracted gas.

Figure 4-12 shows the evolution of the volumes of the natural gas import balance. In 2021, a total volume of 62.6 TWh was imported.

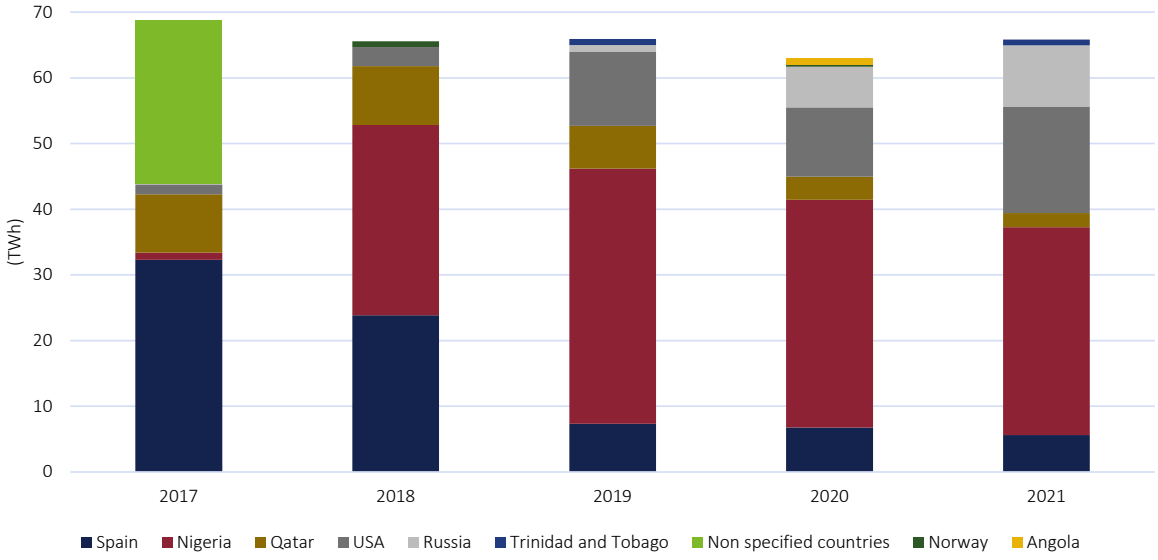
Figure 4-12 - Evolution of imported volumes of natural gas, 2017 to 2021



Source: EUROSTAT, Elaboration ERSE

Figure 4-13 shows the origin of natural gas from 2011 to 2021.

Figure 4-13 - Origin of imported natural gas, 2017 to 2021



Source: EUROSTAT, Elaboration ERSE

The supply from Nigeria relates to contracted LNG deliveries at the Sines terminal. On the other hand, there is a Spanish presence, whose volumes are mainly associated with pipeline imports from Algeria.

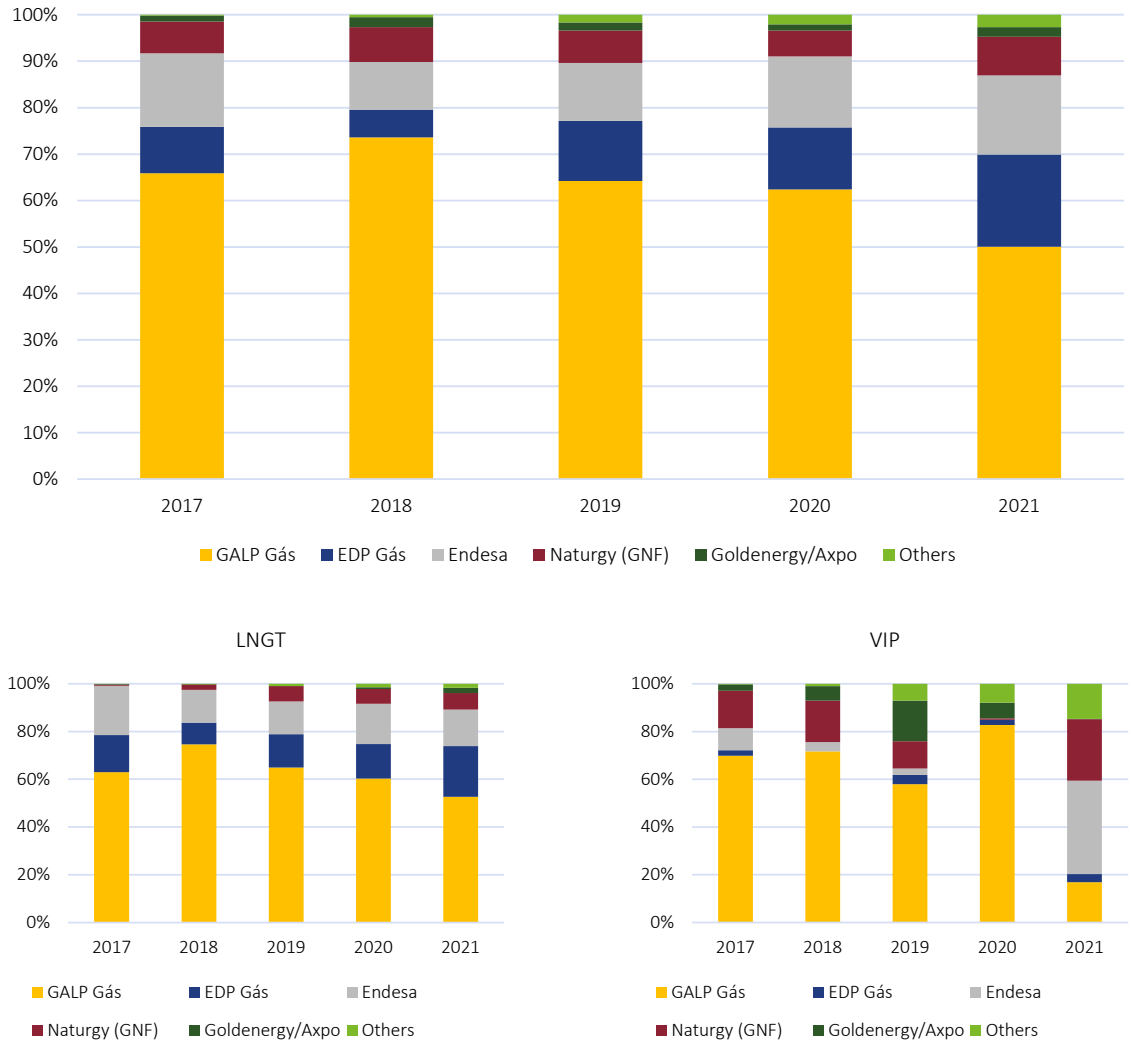
Regarding the remaining import volumes, they refer to LNG reception at the Sines terminal. In 2021, it is worth highlighting contributions from Qatar and, in particular, Russia and the United States which increased from 2020.

EFFECTIVENESS OF COMPETITION

Figure 4-14 presents the natural gas inflows by agent into the RNTGN considering the interconnections by pipeline (VIP) and the Sines terminal (LNGT) between 2017 and 2021.

It is worth mentioning that Goldenergy was bought by Axpo in the end of 2018 and until that moment there were no Axpo volumes and that the Naturgy data includes different group companies.

Figure 4-14 - Entries in RNTG (LNGT+VIP), 2017 to 2021



Source: REN, Elaboration ERSE

Regarding the companies responsible for national supply, analysing the total entries into the RNTG, it can be seen that Galp Gás accounts for around 50 % of the 2021 entries, this figure being the smallest amount

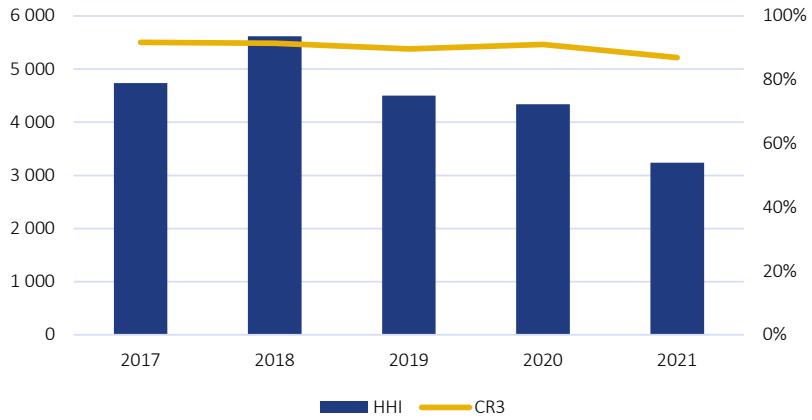
in the portrayed time frame. These entries were carried out mainly from the LNG Terminal. Endesa, was the main VIP user in 2021.

In 2021, Naturgy (through the VIP) and EDP Gás (through the LNG terminal), placed second regarding imports depending on which infrastructure is being considered.

Imports from agents such as EDP Gás and Endesa, resulted mainly from their needs to supply their CCGT plants.

Figure 4-15 shows the concentration indexes, HHI and CR3[141], in the RNTG (LNGT + VIP) entries between 2017 and 2021.

Figure 4-15 – Concentration indexes in RNTG (LNGT + VIP) entries, 2017 to 2021



Source: REN, Elaboration ERSE

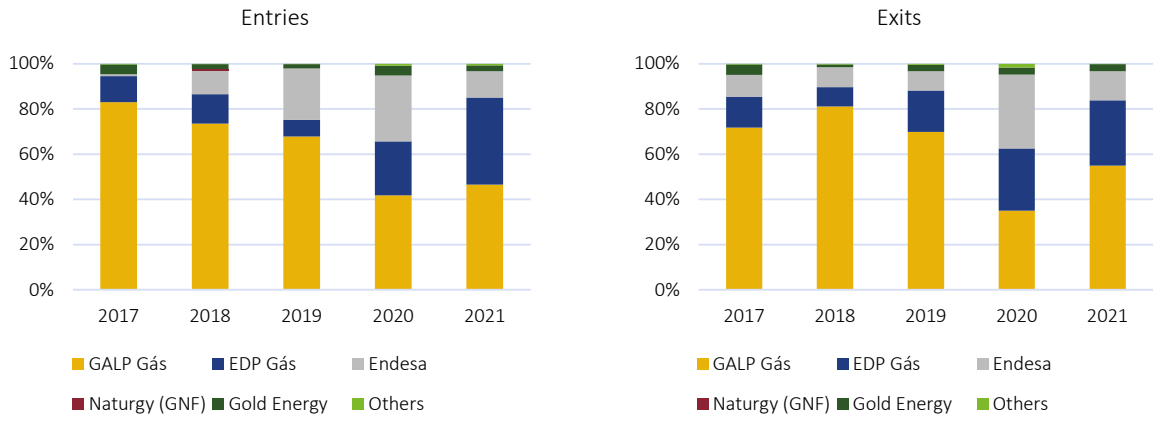
The highest HHI figures for RNTG entries, i.e. higher market concentration, can be found in 2018.

CCGT use strongly influences RNTG inflows, which have a decisive impact on market concentration.

Figure 4-16 shows the use of underground storage between 2017 and 2021.

[141] The CR3 index refers to the market share of the three largest market agents.

Figure 4-16 – Use of underground storage, 2017 to 2021

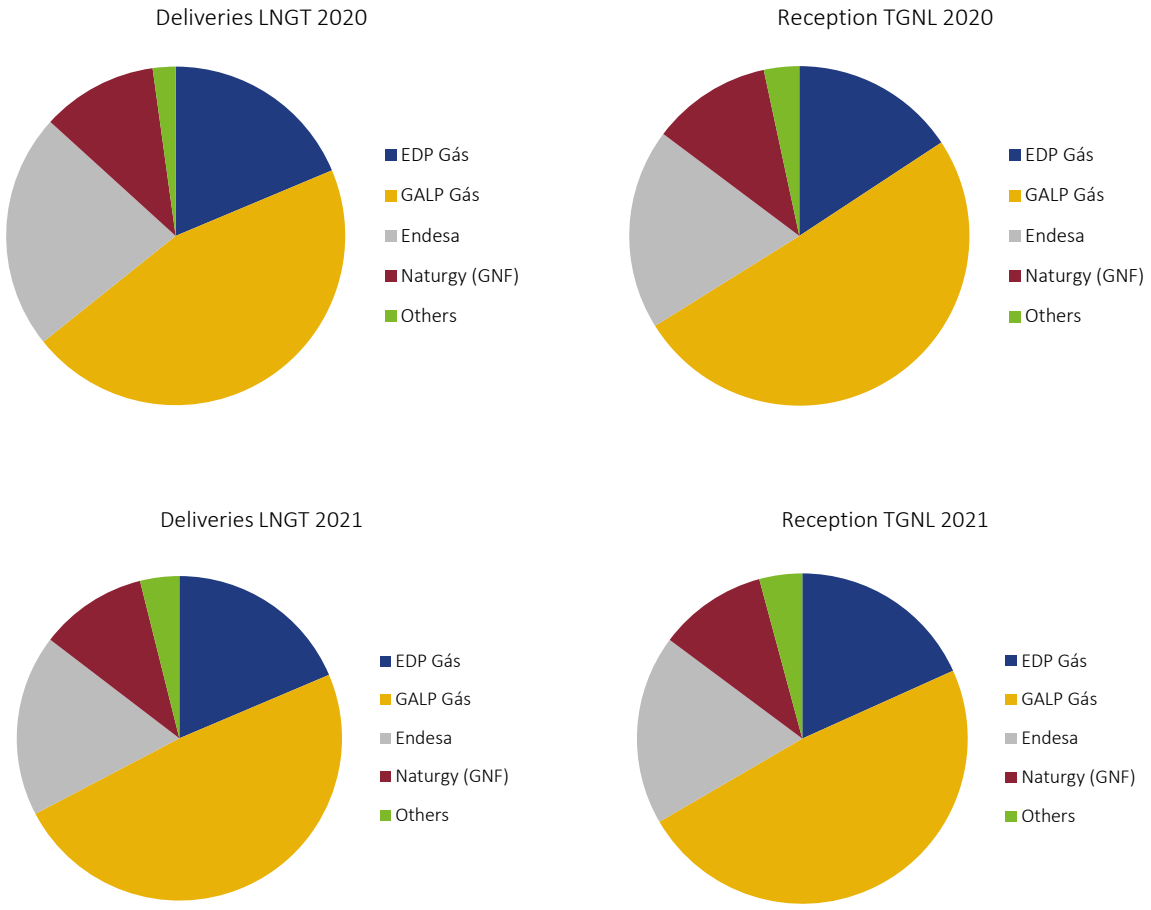


Source: REN, Elaboration ERSE

Regarding underground storage in 2021, it is worth noting a small increase of Galp Gás's presence while Endesa and EDP Gás remain as relevant players.

Figure 4-17 shows the market shares of LNG swaps at the Sines terminal, in 2020 and 2021.

Figure 4-17 – Swaps in LNGT, 2020 and 2021



Source: REN, Elaboration ERSE

The same relevant market agents, and their market shares, can be found in 2020 and 2021.

Swaps in the LNG terminal seemed limited to simple intertemporal swaps as the weights recorded in deliveries were very similar to the weights recorded in the receipts.

Figure 4-18 shows the market share of natural gas swaps in underground storage (US), in 2020 and 2021.

Figure 4-18 – Swaps in underground storage, 2020 and 2021

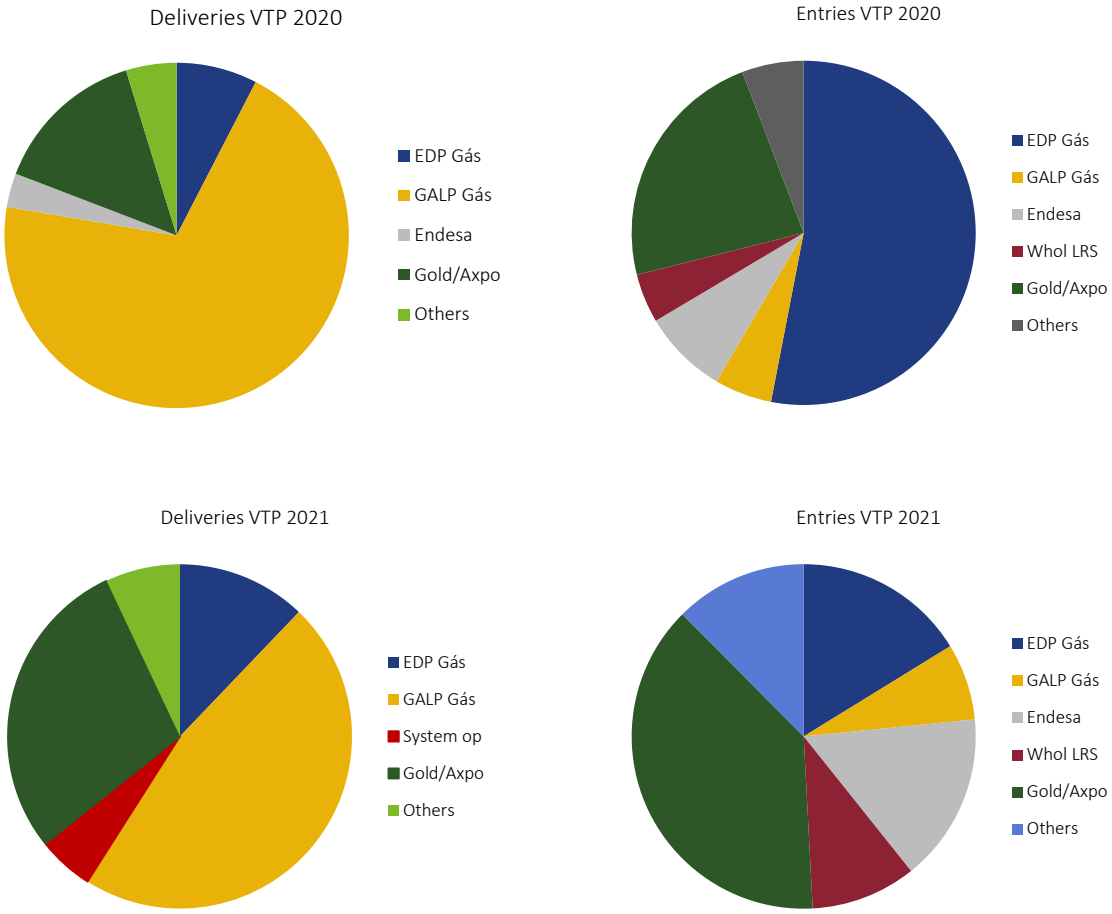
Source: REN, Elaboration ERSE

The same relevant market agents, and their market shares, can be found in 2020 and 2021.

Swaps in underground storage seemed limited to simple intertemporal swaps as the weights recorded in deliveries were very similar to the weights recorded in the receipts.

Figure 4-19 shows the market share of natural gas swaps in the Virtual Trading Point (VTP), in 2020 and 2021.

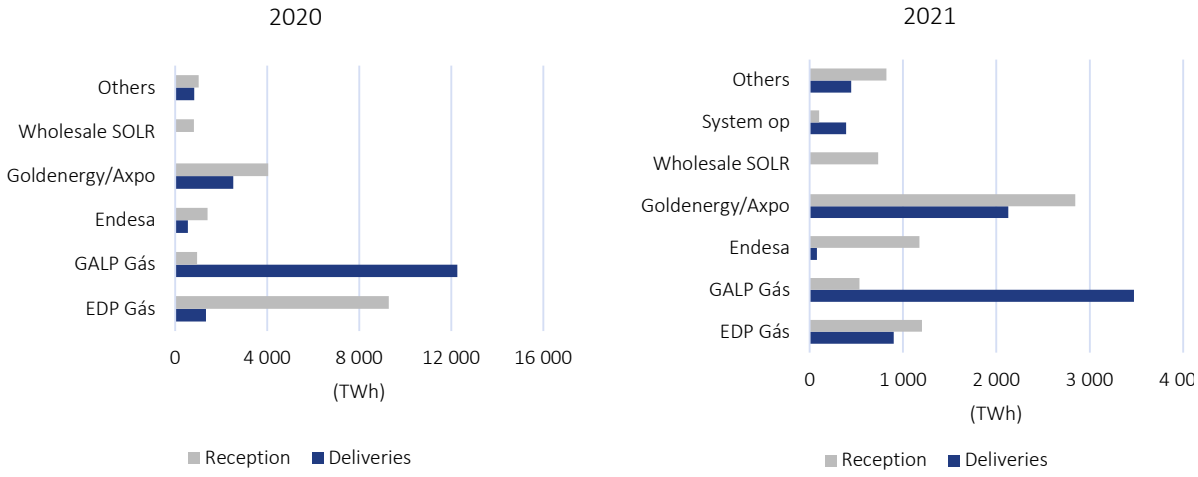
Figure 4-19 – Swaps in VTP, 2020 and 2021



Source: REN, Elaboration ERSE

Contrary to what happened in the terminal or in underground storage, where exchanges appear to be mainly swaps between market agents, Figure 4-20 shows that in exchanges in the VTP, each agent clearly took a position either of seller or of buyer, suggesting that this is the preferred point of exchange for natural gas in the SNGN.

Figure 4-20 – Exchanges in volume (VTP), 2020 and 2021



Source: REN, Elaboration ERSE

GALP is the main seller and recorded high VTP sales shares (47 to 70%), while its purchase volumes were much lower, between 5% and 7%. On the other hand, EDP emerged as the main VTP buying agent, with market shares greater than 50% in 2020 and 16% in 2021. The smaller CCGT production by EDP in 2021 seems to be behind this decrease. Goldenergy/Axpo displays significant quotas, both in sales, 14% to 29%, as in purchases, 23% to 38%. Endesa was primarily a buyer, with shares between 8% and 16%, compared with sales shares of 1 % to 3%.

Concerning the auctions for the release of natural gas surplus quantities from the SNGN supplier, it should be noted that there was no auction during the 2020-2021 gas year.

NETWORK BALANCING RULES

The entry into force in 2016 of the new network balancing rules supportd the development of the wholesale natural gas market, as network users are financially encouraged to keep their portfolios balanced. In fact, any imbalances between supply and consumption in the network users' balancing portfolios are subject to the application of charges that reflect both market prices and the prices of the balancing actions carried out by the TSO, subject to a slight adjustment, in accordance with the rules laid down in Regulation (EU) no. 312/2014, of 26 March.

Given that, in 2016, the trading of spot products with delivery in Portugal on the platform MIBGAS, S.A.[142] was not yet operational, Directive 16/2016, of 27 October was approved in that year, which established that, until the aforementioned negotiation began, the OMIP platform would be used to carry out auctions for the purchase or sale of natural gas, in which the global technical manager of the system (GTG) acts as the sole buyer or seller, aiming to balance the network.

In March 2021, the negotiation of products with a Portuguese delivery started. This development allowed the system operator (GTG) to use the MIBGAS platform for balancing procedures. This use started in 2022 after the transitory period during which the system operator purchased cushion and working gas (and market agents received back their stocks established in 2016) and some procedures were defined. The use of balancing actions is dependent on liquidity conditions.

The negotiation of products with Portuguese delivery allowed setting unbalance prices from the reference of Portuguese transactions prices. In the case there are no transactions for a given day, the reference can be set from previous days until a maximum of seven from which Spain would be used as a reference including cross-border tariffs. A public consultation regarding this rule[143] was carried during 2022 as a result of the high volatility in natural gas wholesale prices and the high number of situations in Portugal with low liquidity hampering this rule effectiveness.

4.2.2 RETAIL MARKET

From the point of view of the development of the gas retail market, we continued to witness a consolidation of the liberalised market, in terms of overall natural gas consumption, and of the number of customers, partly due to the phasing out of regulated tariffs for end-customers.

At the end of 2021, more than 98% of natural gas consumption within the conventional segment (excluding power plants) was supplied by suppliers on the liberalised market.

At the end of 2021, there were 21 suppliers on the free market for natural gas, 20 of them wew supplying customers with an annual consumption lower than or equal to 500 m^3/year.

[142] Which was designated as the trading platform for Portugal, under Regulation (EU) n. 312/2014, of 26 March.

[143] It was proposed that without transactions the Spanish reference including cross border tariffs should always be used.

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

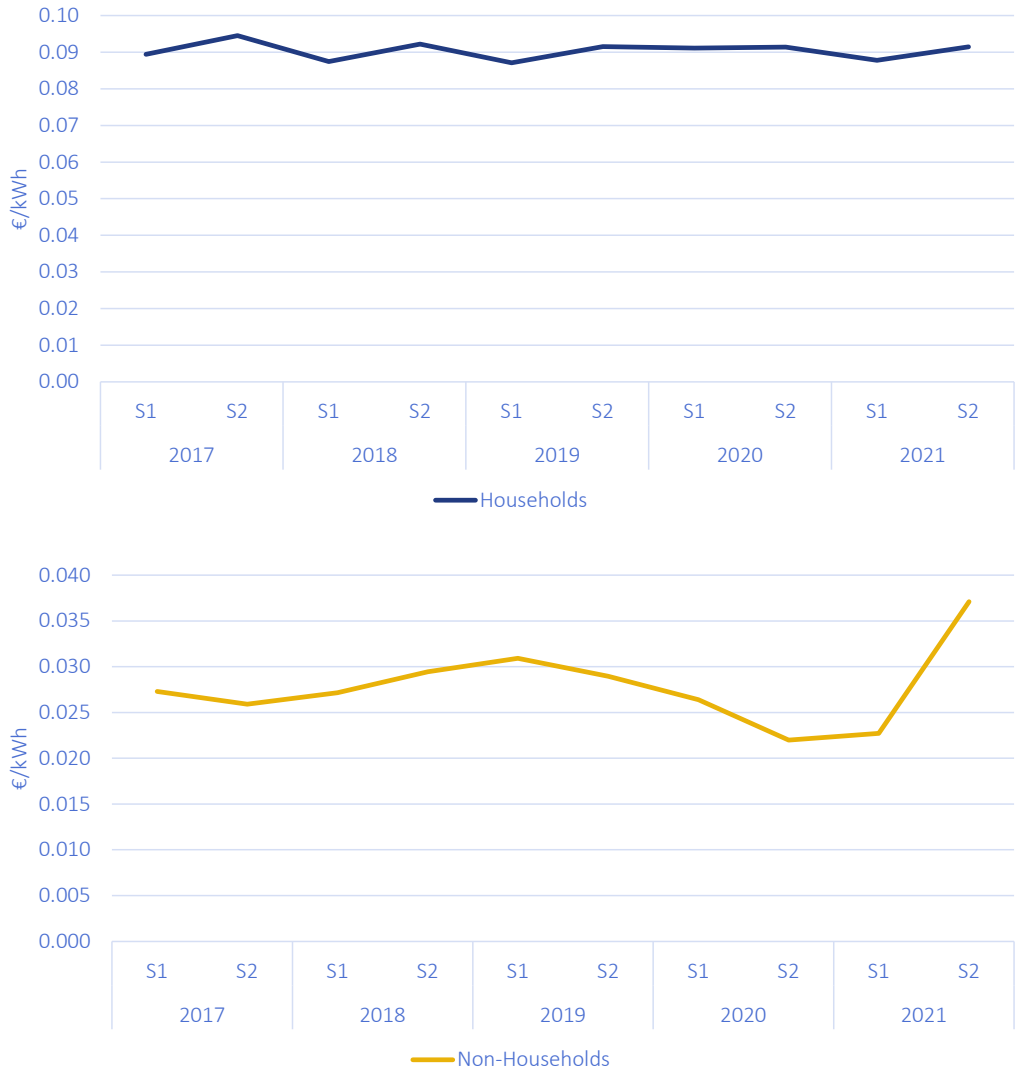
Under the obligations of price disclosure by the suppliers, as well as ERSE's responsibilities regarding monitoring of the natural gas market and information to consumers and other agents on prices charged, suppliers send ERSE information on the average prices charged in the retail market[144], as well as updated information regarding the reference prices charged or expected to be charged in the supply of natural gas at low pressure with an annual consumption lower than or equal to 10 000 m^3 (LP<).

Information regarding the average prices charged in the 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 4-21 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.

[144] Pursuant to Order no. 3677/2011, of 24 February.

Figure 4-21 - Evolution of natural gas average prices for household consumers (with VAT, taxes and other levies) and non-household consumers (without VAT)



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 website[145], which are further detailed in the transparency chapter. These tools are complemented with the publication of quarterly newsletters about the reference market prices in LP<[146].

The analysis carried out on the commercial offers made available by the suppliers revealed that, in December 2021, for the most representative consumer type in the household segment [147], there were 12 suppliers operating in the market with a total of 57 gas-only offers and 149 dual offers (natural gas and electricity), totalling 206 commercial offers.

In that period, the commercial offer of gas with the lowest monthly invoice had a value of 20.53 euro/month, which corresponds to a discount of 10% and a monthly savings of 2.18 euros compared to the regulated tariff. The dual commercial offer with lower monthly invoice had the amount of 103.60 euros/month, which corresponds to a discount of 12% and a monthly savings of 13.75 euros compared to the regulated tariff.

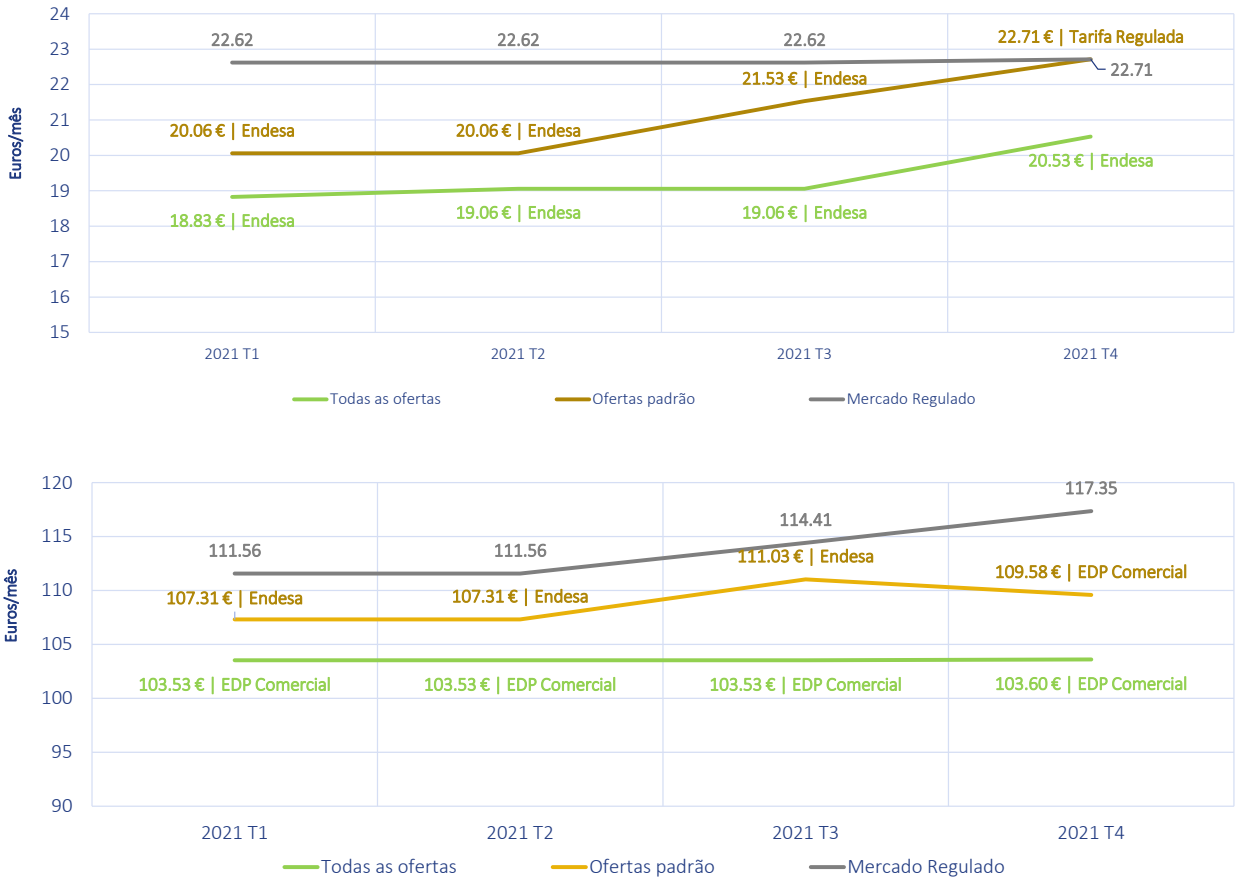
Figure 4-21 shows the evolution of monthly invoicing of the gas offer and the dual offer most competitive in 2021. Over the period under analysis, one can see that gas offer and the dual offer with the lowest value are always more competitive than the regulated market tariff. The difference between the gas offer with the lowest value and the regulated market tariff has been decreasing, based on all commercial offers. In the 4th quarter of 2021, this difference corresponds to 2.18 euros/month, based on all commercial offers. Based on all commercial offers, this differential between the value of the most competitive dual commercial offer and the regulated market tariff has been increasing since the 2nd quarter of 2021, reaching a maximum value in the 4th quarter of 2021. In the 4th quarter of 2021, this difference corresponded to 13.75 euros/month, based on all commercial offers.

[145] At https://simulador.precos.erse.pt/.

[146] Available at Natural Gas Commercial Offers Newsletters.

[147] Representative as regards energy units. Corresponds to consumer type 2 (couple with children and no central heating), with an annual natural gas consumption on 292 m^3.

Figure 4-22 - Monthly invoicing of the most competitive gas offer and dual offer for type 2 consumers in 2021



Prices shown include applicable taxes and fees, except the DGEG fee for electricity and the underground occupancy fee 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

Continuing its efforts to provide information about reference market prices to natural gas consumers, as well as IT tools which help consumers choose their supplier, ERSE hosts on its website an online comparison tool which allows comparison of the market prices offered in mainland Portugal for facilities in LP<[148]. The price comparison tool allows comparison of the prices offered by all the registered suppliers operating in mainland Portugal[149], allowing consumers to choose their natural gas supplier by comparing the prices and the commercial conditions offered by each supplier.

In order to guarantee the transparency of the information made available to consumers by suppliers, ERSE also checks that the suppliers publish 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 to not 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 tool[150], to ensure access to information to all interested parties, in editable format.

In addition, traders wishing to supply 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 customers[151].

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, m^3 to energy units, kWh)[152], and the labelling of natural gas.

[148] Available at https://www.erse.pt/simuladores/precos-de-energia/

[149] Natural gas supply in the Autonomous Regions is not subject to ERSE regulation.

[150] The document is available in https://www.erse.pt/simuladores/precos-de-energia/.

[151] Under the terms of Article 87(2) of Regulation no. 416/2016, of 29 April, with the changes approved by Regulation no. 224/2018, of 16 April and by Regulation no. 365/2019, of 24 April, which approves the RRC of the natural gas sector.

[152] Natural gas is billed in €/kWh, pursuant to Article 111 of the RRC for the natural gas sector.

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 Guide[153], which was reviewed in 2018.

Since 2017, ERSE provides a social tariff calculator, 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 prices of the tariffs 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 Rate (TOS). More specifically, ERSE offers a TOS Simulator[154], 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. This new simulator has as its main objective to assist the decision of investors in the installation of economic activities with the prior knowledge of the impact of TOS on their invoice[155].

EFFECTIVENESS OF COMPETITION

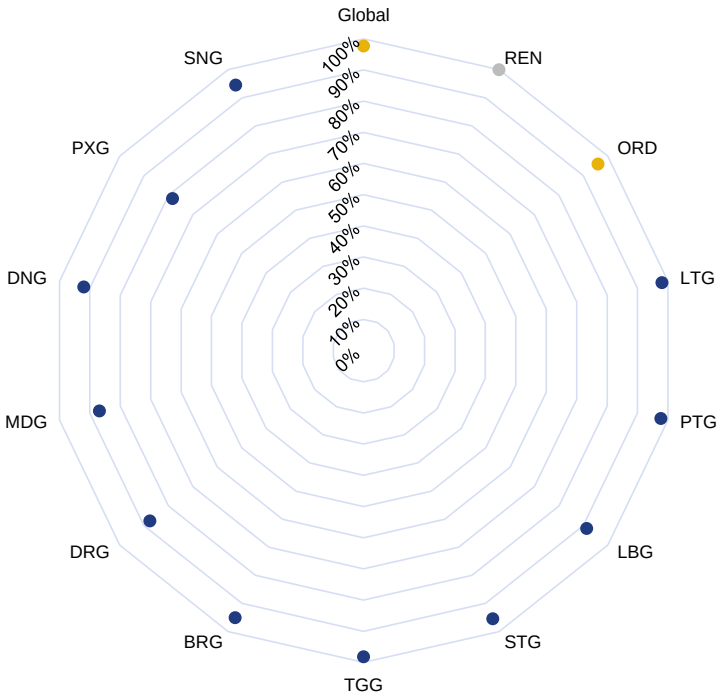
In terms of effective market opening, Figure 4-23 shows the part of the market (in consumption) that was supplied by suppliers on the liberalised market in 2021. It can be seen that nearly 98% of total consumption, with the exception of power plants due to their significant volume in terms of consumption, is provided by market suppliers, and this value is generally higher among the leading natural gas distributors.

[153] Approved by Directive no. 7/2018, of 28 March.

[154] Available at: https://www.erse.pt/simuladores/taxa-de-ocupacao-do-subsolo/

[155] Through Law No. 75-B/2020 of 31 December, which approves the State Budget for 2021, the government legislated to prevent the passing by network operators of the collection of this fee to consumers. The legislative changes necessary for the implementation of the rule are still pending.

Figure 4-23 – Liberalised market penetration by DSO and TSO (total energy consumption, excluding electricity-generating plants), 2021

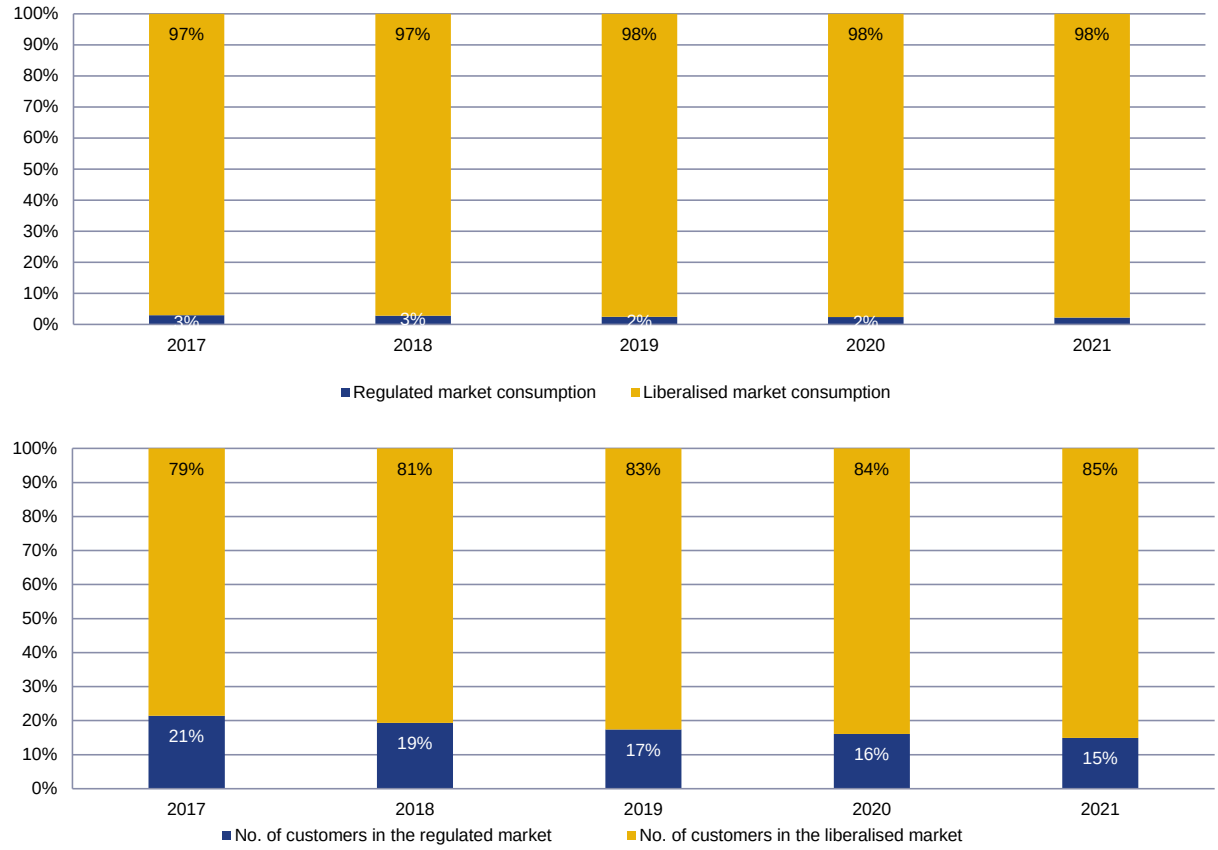


Source: Adene data.

Note: BRG – Beiragás, DNG – Dianagás; DRG – Duriensegás; LBG – Lisboagás; 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 increase in the size of the liberalised market was also due to the phasing out of regulated tariffs that, in January 2013, covered all customers, including households. The evolution of the liberalised market between 2017 and 2021 can be observed in Figure 4-24.

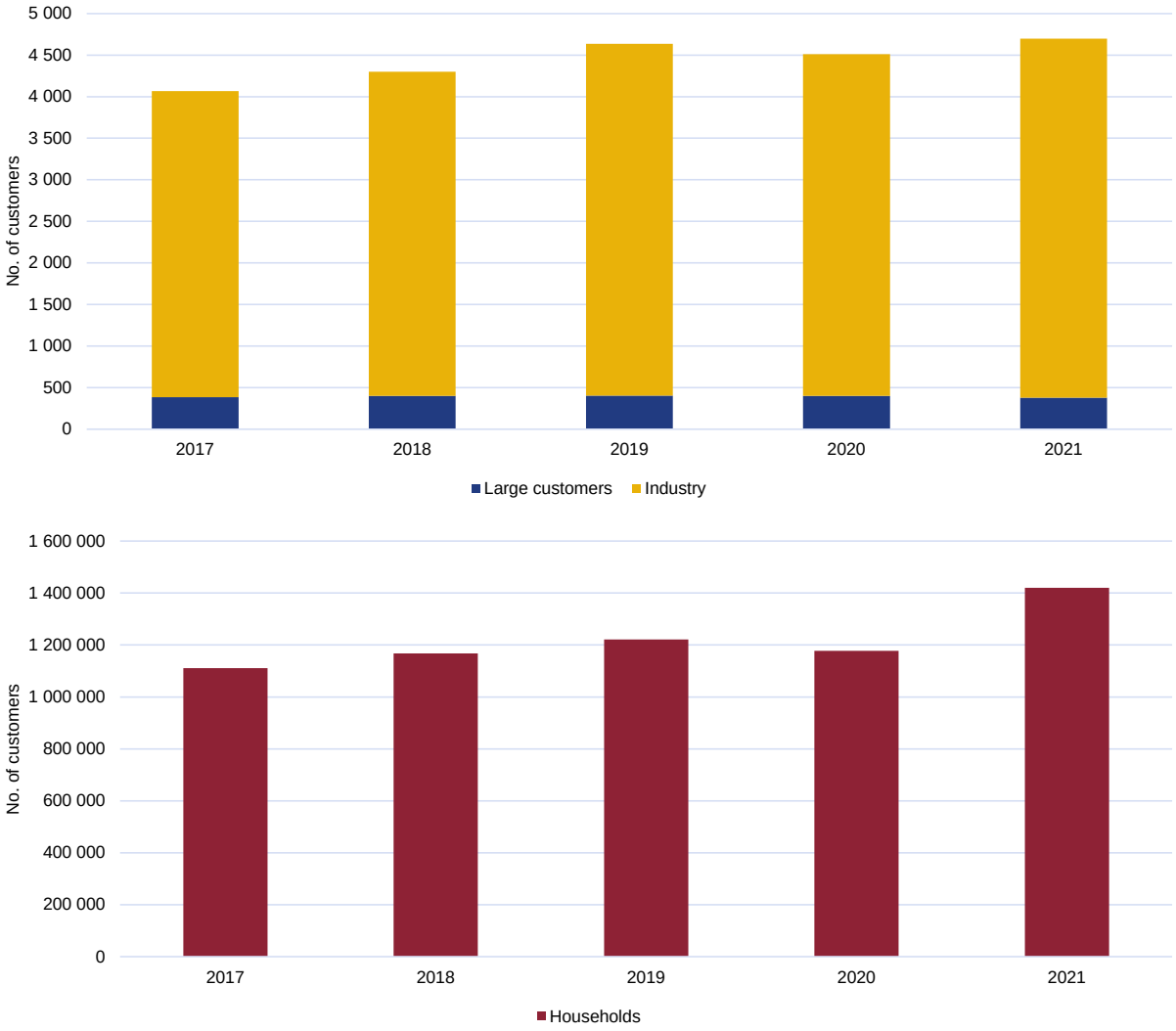
Figure 4-24 – Breakdown of consumption between the regulated and the liberalised markets, 2017 to 2021



Source: Adene data

With regard to the total number of customers, the increase in the market during the period under analysis is mainly due to the continuous entry of household customers and small businesses (segments with consumption lower than 10 000 m^3), and also the entry of industrial customers (with consumption between 10 000 m^3 and 1 million m^3). In 2021, there was an increase in the number of customers in the liberalised market of nearly 17% compared to the previous year (see Figure 4-25). In 2021, approximately 85% of customers were already on the liberalised market.

Figure 4-25 – Evolution of the liberalised market in mainland Portugal, 2017 to 2021

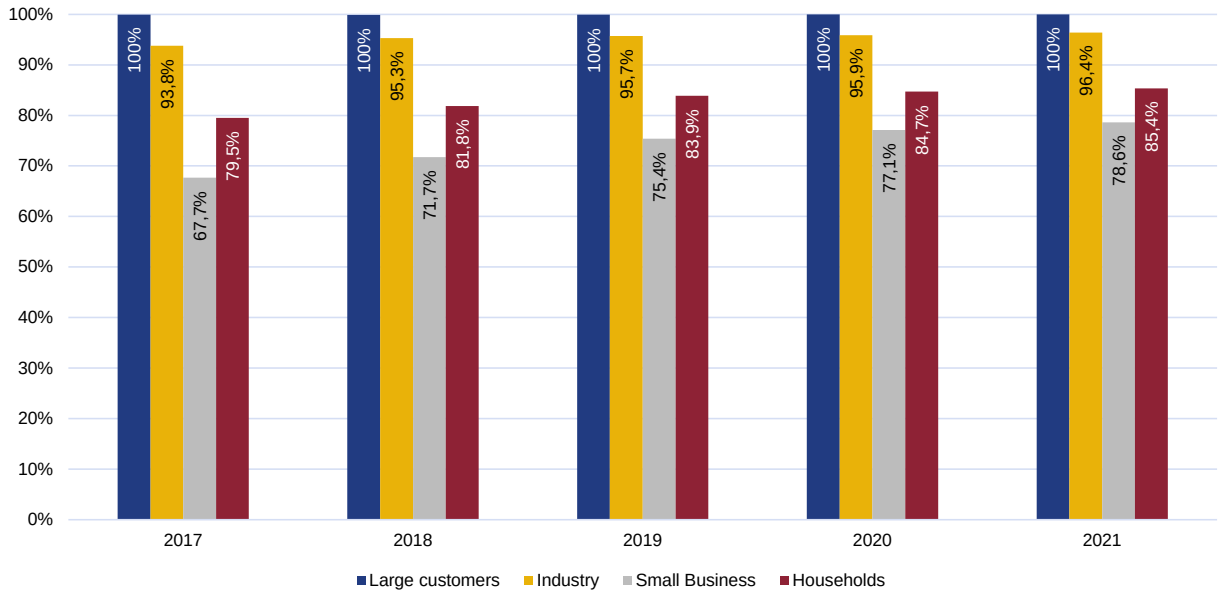


Source: Adene data

In Figure 4-25, we can also see that in 2021 the segment with the highest consumption, corresponding to large customers (with consumption higher than 1 million m^3), showed a slight decrease of 5.7% compared to 2020, while the number of industry clients on the liberalised market increased about 5%. The small business and household customer segments had significant increases of about 26% and 17%, respectively.

The consumption associated with each customer segment of the liberalised market is shown in Figure 4-26, and it is noticeable that market suppliers have been ensuring all the consumption for large customers.

Figure 4-26 – Penetration of the liberalised market by customer segment, 2017 to 2021



Source: Adene data

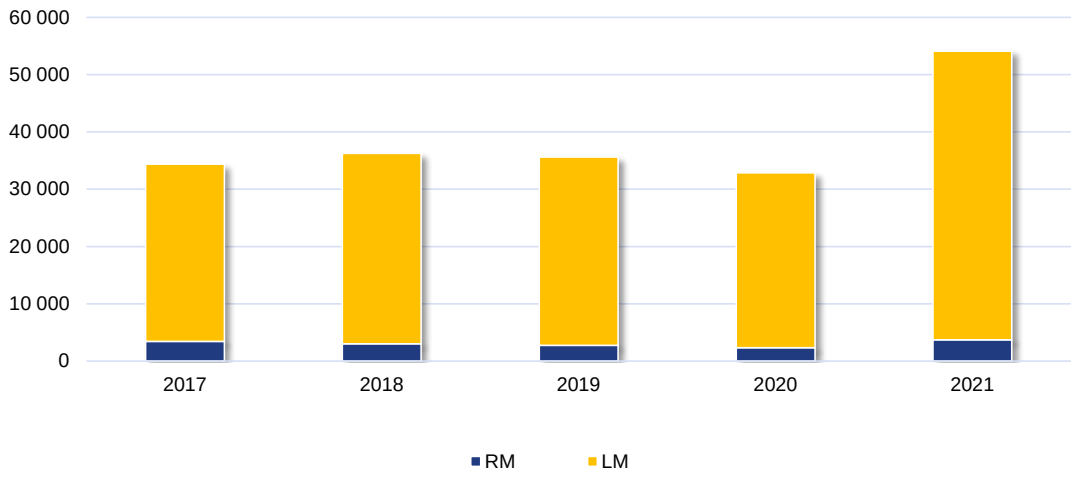
The specific values for the industrial customers segment follow the same rationale as that for total customers. It should be noted that, overall, more than 96% of consumption from this group of customers is already being supplied by suppliers on the liberalised market.

With regard to the liberalised market, there was one supplier, Galp Power, with a market share of over 50% at the end of 2021. The industrial customers segment is the most competitive one; the household customers segment is also characterised by high competitiveness.

In terms of the number of customers, the household segment is the largest one in the liberalised natural gas market, representing almost all customers, but representing only approximately 7% of the total consumption in this market.

In 2021, there were 54 078 consumers in the natural gas sector on social tariffs, 3 735 in the regulated market and 50 343 in the liberalised market, as shown in Figure 4-27. Globally, 3.5% of natural gas consumers in mainland Portugal are on a social tariff. There were no significant changes in the number of beneficiaries of the social tariff, which has remained relatively stable between 2017 and 2020. However, in 2021 there was a growth in this number of around 65%, compared to the previous year.

Figure 4-27 –Number of consumers on social tariffs, natural gas sector, 2017 to 2021

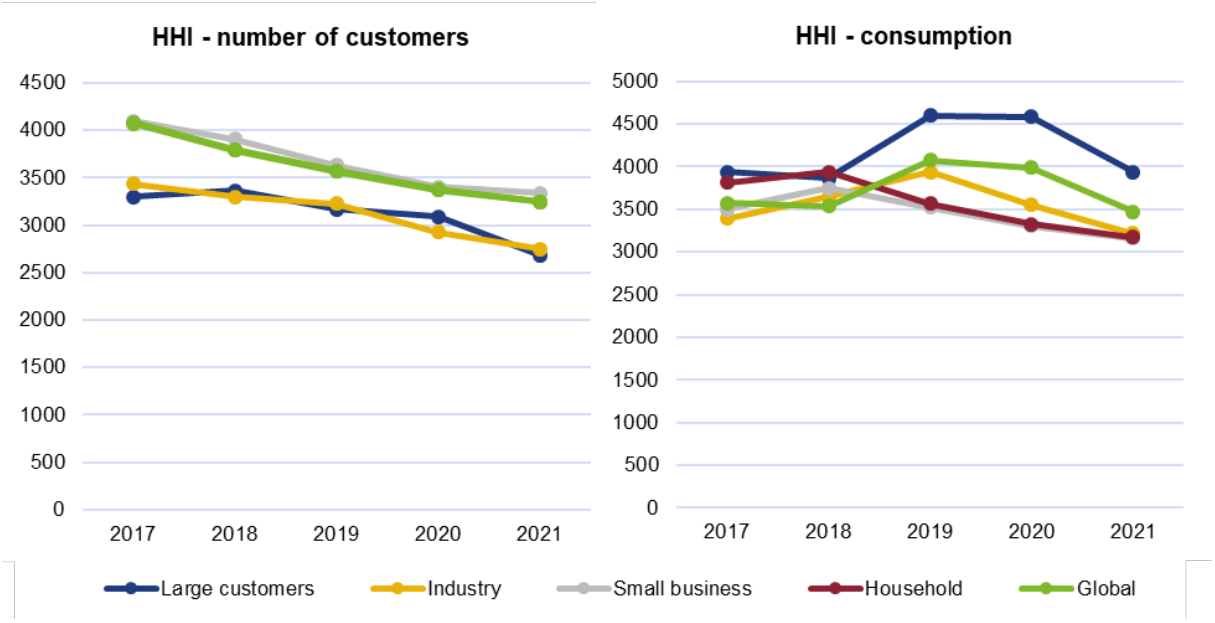


Source: Suppliers data

Note: LM - liberalised market; RM - regulated market

Similar to previous years, in 2021 there was a decrease in concentration in terms of the number of customers. Regarding consumption, there was also a decrease in concentration compared to 2019, as shown in Figure 4-28.

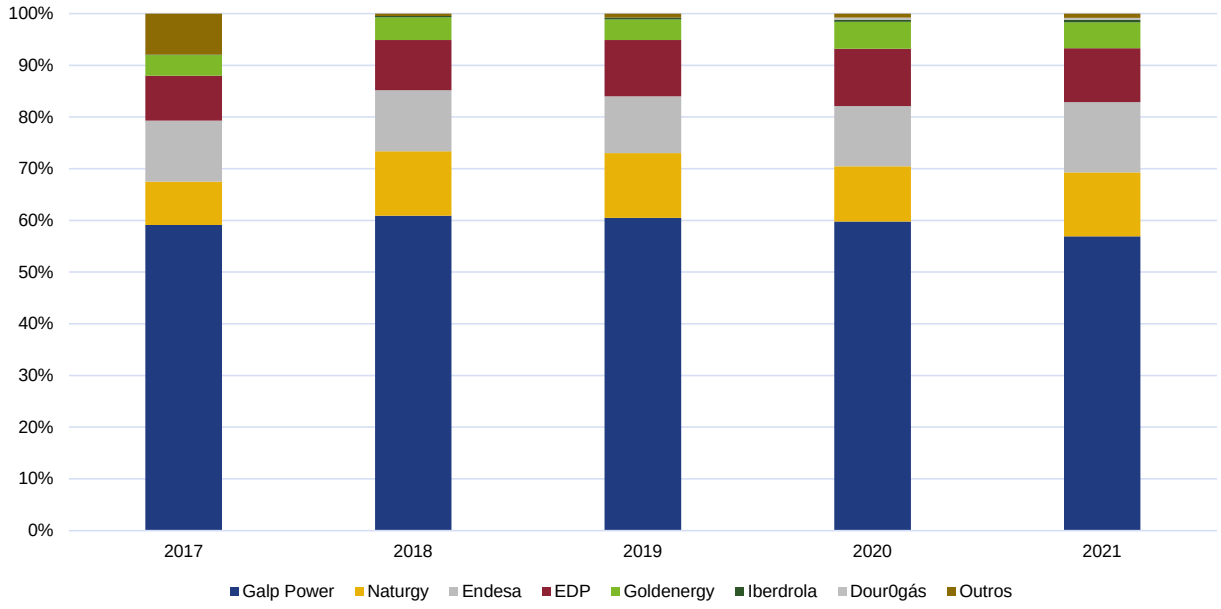
Figure 4-28 – Evolution of gas market concentration in number of customers and consumption, 2017 to 2021 (HHI)



Source: Adene data

The market share of Galp, the main operator on the natural gas market, registered an upward trend until 2018. Since 2019, its market share has been slightly decreasing, being around 57% in 2021, as we can see in Figure 4-29. This decrease is due to the substantial increase in natural gas suppliers on the liberalised market in 2020, which almost quadrupled compared to 2019 (from 13 to 21 suppliers), number that remained in 2021.

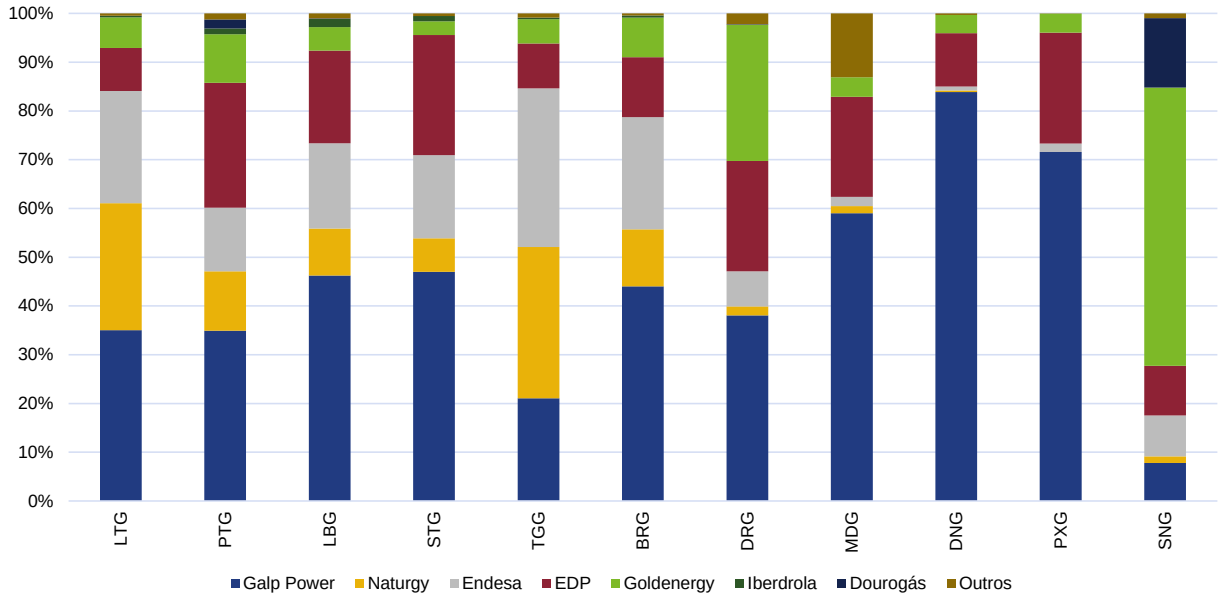
Figure 4-29 – Supply structure in the liberalised market by supplier, 2017 to 2021



Source: Adene data

The breakdown of market share by distribution network, in terms of consumption supplied, is shown in Figure 4-30. In 2021, Galp had a market share above 40% in more than half of the distribution networks.

Figure 4-30 – Breakdown of consumption by suppliers on the liberalised market and by distribution network, 2021



Source: Adene data

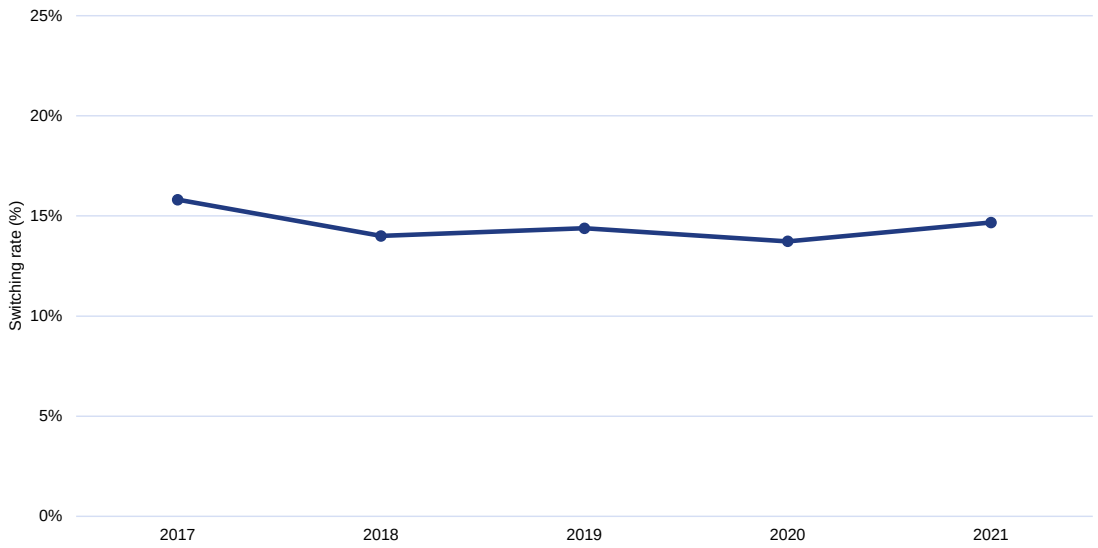
In terms of the share of natural gas supply, in 2021 EDP Comercial continued to have significant positions in the distribution networks, in particular those operated by REN Portgás (PTG), Lisboagás (LBG), Setgás (STG), Duriensegás (DRG), Medigás (MDG) and Paxgás (PXG).

We should also highlight Goldenergy, which continued to hold majority positions in the distribution networks operated by Duriensegás (DRG) and Sonorgás (SNG).

Endesa had strong positions in the areas managed by Lusitaniagas (LTG), Beiragás (BRG) e Tagusgás, while Naturgy had a bigger expression in Lusitâniagás (LTG) and Tagusgás (TGG).

The switching rates remained significant despite the downward trend observed in recent years. In 2021, about 15% of gas consumers switched supplier, as shown in Figure 4-31.

Figure 4-31 – Gas supplier switching in number of clients, 2017 to 2021



Source: Adene data

An analysis of the evolution of the retail market is available on the ERSE website in the form of a monthly report[156], which provides information regarding issues linked to competitive pressure on the market and on each of its segments.

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

RECOMMENDATIONS FOR SUPPLY PRICES

In 2021, ERSE did not publish any recommendations regarding the compliance of supply prices with Article 41 of Directive 2009/73/EC of the European Parliament and the Council of 13 July[157] within the framework of the free market.

It should be noted that the transitional regime for the sale of natural gas to final customers in LP has remained in force, while this ceased to be in force for final customers in MP in the year 2020-2021.

[156] https://www.erse.pt/biblioteca/atos-e-documentos-da-erse/?tipologia=----+Mercado+Liberalizado+-+G%C3%A1s+Natural&setor=&ano=&descricao=

[157] Article 41(1) point p) of the Directive

MEASURES TO PROMOTE EFFECTIVE COMPETITION

As mentioned above, ERSE has its own powers, which arise from the legal framework for the energy sector and for competition. In this context, during 2021, no opinions were requested from the Competition Authority.

It is also important to mention that, in 2021, Directive n.º 7/2021, of 15 de April, was published, establishing the risks and guarantees management regime in the National Electricity System and in the National Gas System, which implements in regulatory terms the provisions of the Decree-Law n. 62/2020, of 28 August, thas establishes the organization and functioning of the National Gas System and the respective legal regime, concerning the legal existence of an integrated risk and guarantee management regime within the scope of the National Gas System

Also during 2021, and due to the repeated occurrence of historically high prices, a Regulation[158] was published that provides for the possibility for suppliers to request the application of preventive last resort supply to their customer portfolio when they are unable to ensure the regular exercise of their activity under conditions of economic viability in the short term, thus avoiding a definitive exit from the market and consequent systemic risk for the National Electricity System and the National Gas System. This preventive last resort supply can be requested by a supplier to ERSE, indicating the reasons why it is needed, and if accepted, their customers move to the supplier of last resort.

ERSE also discloses, on its website, information on the suppliers covered (to date) by the application of preventive last supply supply. In 2021, and for the natural gas sector, the suppliers covered by the last resort supply process (all processes) and the respective number of affected customers (transferred for supply by the SOLR) are those shown in the following table:

Table 4-5 – Natural gas suppliers covered by the last resort supply process

Date	Supplier	Nr. Of clients
23/10/2021	Zodivimp, Lda.*	74
04/11/2021	PH Energia, Unipessoal, Lda.*	1 055

NOTE: * - Suppliers covered by a preventive last resort supply process.

[158] Regulation n.º 951/2021

EXTRAORDINARY MEASURES IN THE GAS SECTOR DUE TO EPIDEMIOLOGICAL EMERGENCY COVID-19

During 2020 and 2021, and as mentioned already for the electricity sector, ERSE approved and published several regulations and instructions concerning the conditions for the provision of energy supply services as essential public services to consumers, in response to the epidemiological emergency.

These measures cover the prohibition of interruption of supply decreed by the Government, and enables the possibility for consumers to stagger the payment of bills and corresponding payment plans between network operators and suppliers.

Natural gas customers who were in a situation of business crisis, namely regarding the total or partial closure of their economic activity, were entitled to change the capacity, fixed term and energy charges to be billed.

Regarding suppliers, the possibility was given to request from the network operator an additional moratorium on the payment of network access costs, in the cases provided for in the regulations, as well as allowing the consolidation of commercial deviations. The deadline for reporting quality of commercial service information to ERSE was also extended.

Regime for management of risk and guarantees

Decree-Law N.º 62/2020, of 28 August, which establishes the organisation and operation of the National Gas System (SNG) and its legal regime, and transposes Directive (EU) 2019/692, establishes, for the gas sector, an integrated risk and management of guarantees regime within the scope of the SNG, expressly providing for the figure of the integrated guarantee manager for electricity and gas and the adoption of prudential management rules.

In that same diploma, Article 82 delegates to ERSE the regulatory definition of the activity of guarantee management, risk management and provision of guarantees within the scope of the natural gas system, as well as the activity and procedures to be observed by the integrated guarantees manager, aiming at its implementation in a definitive model.

With the conclusion of the legal framework, the extension to the gas sector, with the necessary adaptations, of the regulatory framework applicable to the electricity sector of the regime for management of risk and guarantees provided for in Directive No. 2-A/2020, of 14 February, was established. ERSE once again put a model of rules for the management of risks and guarantees to public consultation, now

applicable to both sectors, duly aligned with the legal context of each of them, which culminated in the approval of Directive no. 7/2021, of 15 April[159].

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

Since 1 July 2012[160], natural gas regulated tariffs for supply of natural gas to end-customers with annual consumption lower than or equal to 10 000 m^3, approved by ERSE for mainland Portugal, have a transitional nature.

In the gas year 2020-2021, the transitional tariffs applied to the retail supplier of last resort (SOLR) in LP [161], thus ending the transitional regime for MP supply on the regulated market. The transitional tariffs for HP supplies ended in July 2012.

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[162], all approved by ERSE[163].

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.

Figure 4-32 presents the evolution of the available capacity in the SNG[164], daily average consumption and annual peak demand between 2009 and 2021. During this period, daily average consumption of natural

[159] Directive no. 7/2021, which establishes the regime for management of risk and guarantees in the National Electricity System (SEN) and the National Gas System (SNG).

[160] For consumers with an annual consumption higher than 500 m^3. For consumers with an annual consumption equal to or lower than 500 m^3, the transitional tariffs regime began on 1 January 2013 according to Decree-Law no. 74/2012, of 26 March.

[161]The application period for the transitional tariff for natural gas supply in LP, with annual consumption higher than 10 000 m^3, was changed to 31 December 2022, and for natural gas supply in LP, with annual consumption equal or lower than 10 000 m^3 was changed to 31 December 2025, by Government Ordinance no. 83/2020, of 1 April.

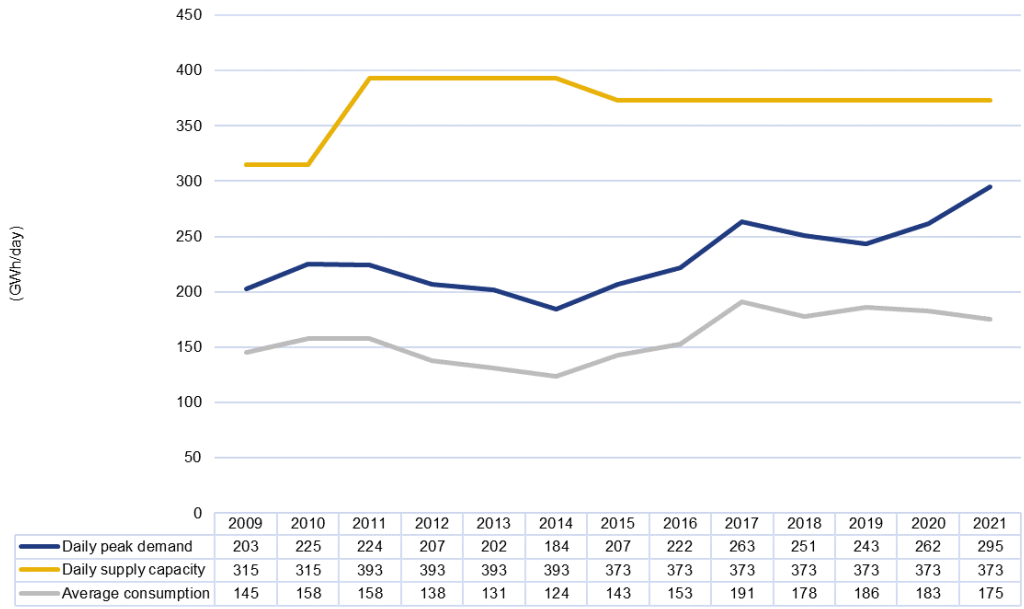
[162] The transitional tariff regime is determined by the application of Government Ordinance no. 108-A/2015, of 14 April and Order no. 11412/2015, of 12 October.

[163]Directive no 11/2020 of 25 June and Rectification Declaration no 549/2020 of 11 August (gas year 2020-2021) and Directive no 12/2021 of 29 July (gas year 2021-2022).

[164] The capacity offered in the SNG corresponds to the sum of the entry capacity at the Campo Maior and Valença do Minho interconnections and the connection between the RNTG and the Sines LNG terminal.

gas increased at an average rate of 2.6% per year. 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.

Figure 4-32 – Evolution of supply capacity in the SNG, daily average consumption and peak demand, from 2009 to 2021



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Daily peak demand	203	225	224	207	202	184	207	222	263	251	243	262	295
Daily supply capacity	315	315	393	393	393	393	373	373	373	373	373	373	373
Average consumption	145	158	158	138	131	124	143	153	191	178	186	183	175

Source: REN Gasodutos – PDIRG 2022-2031 and REN – Technical Data for 2021

As shown in the figure above, the daily available capacity increased by 25% between 2010 and 2011, as a result of an upgrade of the regasification system of 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 interconnection. This decrease continues to be a constraint. Furthermore, it is still possible to observe that the SNG's available capacity is remarkably higher than the daily peak demand along the entire period. In 2021, the average daily consumption and the peak demand corresponded respectively to 47% and 79% 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 4-6 – Yearly natural gas demand, 2017 to 2021

Yearly natural gas demand per network type (TWh)	2017	2018	2019	2020	2021
Power Plants	27.56	20.77	23.82	24.72	22.33
High Pressure Network Customers	16.51	17.20	17.13	16.24	14.35
Distribution Network Customers (Concessioned, with GRMS (1))	24.09	25.13	25.13	24.00	25.01
Distribution Network Customers (Licensed with UAG (2))	1.50	1.83	1.87	1.94	2.14
Total	69.66	64.92	67.95	66.90	63.83

(1) GRMS - Gas Regulation and Metering Station
(2) UAG - Gas Autonomous Units

The table below presents a set of indicators that characterise the infrastructure and the network operators of the SNG between 2017 and 2021.

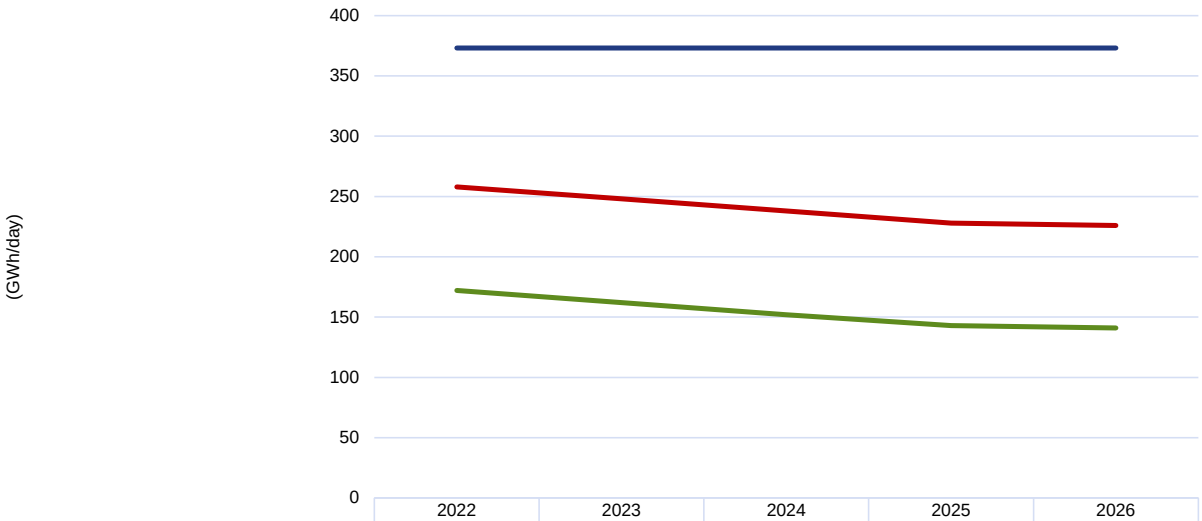
Table 4-7 – SNGN's infrastructure and network operator indicators, 2017 to 2021

Indicators	2017	2018	2019	2020	2021
Maximum gas daily consumption (GWh/day).	263	251	243	262	295
Pipeline entry capacity in TWh/y.	52.56	52.56	52.56	52.56	52.56
Pipeline exit capacity (exports) in TWh/y	29.2	29.2	29.2	29.2	29.2
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)	321	321	321	321	321
Underground gas storage- Maximum withdrawal capacity (GWh/day)	129	129	129	129	129
Number of TSOs	1	1	1	1	1
Extension of TSO grid (km)	1375	1375	1375	1375	1375
Number of DSOs	11	11	11	11	11
Extension of DSO grids (km)	18565	18987	19395	19675	20037

4.3.1 FORECAST OF DEMAND AND SUPPLY

Figure 4-32 shows forecasts of daily available capacity in the SNG, daily average consumption and peak demand, for the outlook period 2022-2026, based on data provided by REN Gasodutos S.A..

Figure 4-33 – Forecast of daily supply capacity in the SNG, daily average consumption and peak demand, from 2022 to 2026



	2022	2023	2024	2025	2026
Forecast of daily supply capacity	373	373	373	373	373
Forecast of daily average consumption	172	162	152	143	141
Forecast of daily peak demand	258	248	238	228	226

Source: REN Gasodutos – PDIRG 2022-2031

The expected available capacity for commercial purposes is considerably higher than the expected capacity that will be used in the coming years. In 2026, the average consumption and the peak demand are expected to represent about 38% and 61% 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 2022-2031 do not have any impact on available capacity.

4.3.2 MEASURES TO SAFEGUARD SECURITY OF GAS SUPLLY

The promotion of conditions to ensure the SNG's security of supply is based on both supply side and demand side measures.

Although the SNG has depended mainly on a major gas supplier country - Algeria -, for a number of years, the diversification of sources of supply was enhanced by the Sines LNG terminal, which entered into operation in 2004. Since 2018, the country that most contributed for the supply of natural gas of the SNG 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 from 2017. Since 2018, there are market agents in the SNG, with significant activity in Spain, although since then there has been a reduction in the use of the interconnections and an increase in the LNG terminal, benefitting from the diversification of the existing sources of supply 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 the European Parliament and of the Council 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 SNGN.

Based on the findings of the Report on "Security of Supply Risk Assessment for Portugal, referring to the period 2020-2040"[165], 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[166].

[165] Published by DGEG and approved by the Deputy Secretary of State and Energy.

[166] Previously established by Article 50º-B of Decree-Law No 140/2006, of 26 July as amended by Decree-Law No 231/2012, of 26 October.

5 CONSUMER PROTECTION AND DISPUTE SETTLEMENT

5.1 CONSUMER PROTECTION

The protection of the rights and interests of energy consumers is a general attribution of ERSE, which is reflected in all of its activities and underlines 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 relative to 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 2021 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, General Directorate for Consumers, municipal services), to consumer dispute arbitration centers, as well as to other entities that, due to their public interest mission of national or more local scope, aim to protect consumers.

The ERSE virtual assistant - Gia - is also available on the ERSE portal, which in 2021 had around 1 700 frequently asked questions and corresponding answers regarding 10 themes.

During 2021, the information campaign was maintained through selected national radio stations, with advice for consumers. “Minuto ERSE" was an information campaign on the Antena 1 radio station, which aimed to reinforce consumer literacy in the field of energy. This item ran from March to September 2021 and included 19 emissions.

The ACE - Apoio ao Consumidor de Energia (Energy Consumer Support Office) Newsletter is issued on a quarterly basis and presents the requests for information and complaints answered in that quarter, making a comparison with the three previous quarters, the issues raised, the companies subject to complaint, and the 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 area of energy consumer protection.

Under the ERSEFORMA programme, in 2021, six information and training sessions were held for the scheme’s priority target audience, which are consumer protection bodies and the alternative consumer dispute resolution entities, such as the consumer dispute 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 subjects of these training sessions were the following: "Service continuity and power quality" (5 and 24 February); "Tariffs and energy prices 2021" (22 February and 22 March); "Commercial service quality - indicators and some regulatory aspects" (13 and 21 October). 232 participants registered for these events.

The informative and training contents used in the actions described are made available on ERSE's website[167].

Also in the field of consumer education and information, a protocol was established in 2021 with the GNR – Guarda Nacional Republicana (National Republican Guard) - aiming to develop actions to promote energy literacy and identify abusive or unfair practices by market operators towards consumers.

Based on this protocol, ERSE held an information session (14 September) for GNR military personnel on the energy sector in general and on ERSE's sanctioning activities, to enable them to identify possible infractions by energy market agents with consumers, especially the most vulnerable, during their outreach activities with the community. About 120 military personnel were present.

[167] Available at https://www.erse.pt/erseforma/erseforma/

In April 2021, ERSE participated in two information sessions on consumer rights, namely on support measures for the most vulnerable electricity consumers, in an initiative organised by the Directorate General for the Consumer, in partnership with the municipal company Gestão do Arrendamento da Habitação Municipal de Lisboa, S.A.(Gebalis).

Informative leaflets and brochures were also published, the main objective of which is to enlighten consumers on the most current issues resulting from legislative or regulatory changes. Examples of this are the "Guide to Answers on Frequently Asked Questions", aimed at vulnerable electricity consumers, which marked World Consumer Day, and the brochure on the application of social tariff discounts in electricity and natural gas.

New educational videos were also produced for consumers and were widely disseminated in the media, such as, for example, the video: "How to act in case of bad commercial practices?".

In the area of dispute resolution, stemming from commercial and contractual relations between suppliers and energy consumers, in addition to providing clarifications for the parties involved, ERSE may recommend or suggest the resolution of a dispute, even if it cannot impose the proposed solution on the specific case.

In parallel, ERSE promotes the use of arbitration, in particular that which is available through the existing consumer dispute arbitration centres. Complying with the cooperation protocols between ERSE and these seven arbitration centres, whose operations cover the territory of mainland Portugal, ERSE provides them with technical and financial support. More detailed information is provided in the following chapter regarding the handling of complaints (and requests for information) carried out by ERSE in 2021.

5.2 DISPUTE SETTLEMENT

Complaint handling/dispute resolution is one of the ACE's area of action. ACE is a functional unit which is currently integrated in ERSE's new Energy Consumers Division. Its two other areas of work are consumer information and training, referred to in the previous section.

ERSE ensures the treatment and response to all complaints and requests for information received, registering them and proceeding with their analysis, clarification, recommendation or forwarding, depending on the subject matter, the consumer's request, ERSE's competences, the existence of evidence of an administrative offence, among others.

In 2021, ERSE received 2 111 requests for information, 925 of which were received directly through the Livro de Reclamações Eletrónico (Electronic Complaints Book) platform, corresponding to an increase of around 25% compared to 2020. The individual clarifications to energy consumers are also ensured through a telephone line dedicated to customer service, every working day, between 3 pm and 6 pm.

Complaint handling, similar to replies to requests for information, relies on a computer tool for process management (CRM), through which the various stages of the process are managed, from sorting to final response, including legal analysis and possible requests for technical support from other departments within ERSE. Once the response of the entity complained against to the consumer has been analysed, which must to be sent to ERSE, complementary information may be provided to the consumer or additional clarification may be requested from the entity complained against.

In 2021, 33 633 complaints were registered, which gave rise to new cases, with an increase of around 39% compared to 2020.

A total of 32 630 complaint processes were concluded, 63% of which originated in the companies' complaint books (physical and electronic).

The electricity sector was the most present, with 25 126 complaints and 1 317 requests for information, considering the universe of electricity consumers (5.3 million), which is much higher than the natural gas sector (approximately 604 000), which, in turn, recorded 1 818 complaints and 133 requests for information. Dual supply (electricity and natural gas), with around 921 000 consumers, led to 4 454 complaints and 194 requests for information. ERSE also received 130 complaints and 24 requests for information relative to electric mobility.

"Invoicing" in its various subcategories (lack or difficult access to billing, double billing, unclear or incorrect billing and billing adjustments), and the "supply contract" remained the most complained about topics in 2021, with 12 159 and 4 155 complaints, respectively.

Among the results obtained with the handling of complaints, we highlight 7 757 complaint processes concluded with direct information to the consumer and 3 085 with a change of position from the supplier and resolution of the conflict.

In 2021, the seven consumer dispute arbitration centers, to whom ERSE provides technical and financial support, registered a total of 2 143 processes related to the supply of electricity and natural gas (1 087

complaints and 1 056 requests for information). 813 specific cases were resolved in these same arbitration centers, 538 by mediation/conciliation between the parties and 275 by arbitration trial.

Throughout 2021, we would also highlight the effort spent on the implementation of the new technological solution to support the management of the treatment of complaints and requests for information, in order to improve the response capacity of ACE, called RIR - Resolução de Pedidos de Informação e Reclamações (Resolution of Requests for Information and Complaints).

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 National Electricity Transmission Network and National Natural Gas Transmission Network aims at assessing compliance with conditions relating to the legal and ownership unbundling of these operators.

Since 2015, ERSE has been monitoring compliance and permanently supervising the certification conditions granted to those operators.

Within this framework, electricity TSO and natural gas TSO must send to ERSE, by 30 June of each year, a report related to 31 May of that year, containing complete and detailed information on the state of compliance with the conditions relating to the legal and patrimonial independence of the TSO provided for in the legal certification scheme, as well as all minutes of the general meeting 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 2021, 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., as per the reports of these operators sent to ERSE in June 2021.

6.2 LEGISLATIVE DEVELOPMENTS

Within the scope of the regulatory power entrusted to ERSE, the following regulations were published in 2021:

- Regulation n.º 103/2021, of 1 February - Amends the Regulation on Electric Mobility;
- Regulation n.º 180/2021, of 2 March - Approves the Regulation establishing exceptional measures in the scope of the National Electricity System and the National Natural Gas System;
- Regulation n.º 341/2021, of 14 April - Approves the Regulation on the Operation of Infrastructure in the gas sector and revokes Regulation n.º 417/2016, of 29 April;
- Regulation n.º 343/2021, of April 15 - Approves the Regulation of the Plan for Promoting Efficiency in Energy Consumption in the Electricity and Gas Sectors;
- Regulation n.º 368/2021, of April 28 - Approves the Tariff Code for the gas sector and revokes Regulation n.º 361/2019, of April 23;
- Regulation n.º 373/2021, of 5 May - Approves the Code on Electricity Self-Consumption and revokes Regulation n.º 266/2020, of 20 March;
- Regulation n.º 406/2021, of 12 May - Approves the Code on Quality of Service of the Electricity and Gas Sectors and revokes Regulation n.º 629/2017, of 20 December;
- Regulation n.º 407/2021, of 12 May - Approves the Code on Access to Networks, Infrastructure and Interconnections of the Gas Sector and revokes Regulation n.º. 435/2016, of 9 May;
- Regulation n.º 785/2021, of August 23 - Approves the Tariff Code for the electricity sector and revokes Regulation n.º 619/2017, of December 18, amended by Regulations n.º 76/2019, of January 18, and 496/2020, of May 26;
- Regulation n.º 836/2021, of 7 September - Approves exceptional measures within the scope of the National Electricity System and the National Natural Gas System;
- Regulation n.º 951/2021, of 2 November - Approves exceptional measures within the scope of the National Electricity System and the National Gas System;
- Rectification Statement n.º 813/2021, of 16 November - Rectifies Regulation n.º 785/2021, of 23 August;

Also of a regulatory nature, the following normative acts approved by ERSE in 2021 should be highlighted:

- Directive n.º 1/2021, of 8 January - Approves the tariffs and prices for electricity and other services in 2021;

- Directive n.º 2/2021, of 19 January - Approves the incentive for optimised management of non-terminated PPAs;

- Directive (extract) n.º 3/2021, of 25 January - Approves the loss profiles applicable in 2021;

- Directive n. º 4/2021, of 25 January - Approves the third amendment to procedure n. º. 13-A of the Procedures Manual for Overall System Management in the Electricity Sector;

- Directive n.º 5/2021, of 24 February - Approves the definition of the parameter of charges borne by special regime producers within the scope of the transitory rule of Article 8 of Decree-Law n.º 76/2019;

- Directive n.º 6/2021, of 15 April - Approves the return of stocks and acquisition of filling gas from the National Gas Transmission Network (RNTG);

- Directive n.º 7/2021, of 15 April – Approves the regime for risk management and guarantees in the National Electricity System (SEN) and in the National Gas System (SNG);

- Directive n.º 8/2021, of 30 April - Approves the Parameters and Tariffs of the Managing Entity of the Electric Mobility Network for 2021;

- Directive n.º 9/2021, of 12 May - Approves the Procedures Manual for the Overall Technical Management of the National Gas System and revokes Directives n.º 18/2016, of 27 October, and n.º 20/2016, of 20 December, and Annex II of Directive n.º 14/2020;

- Directive n.º 10/2021, of 17 June – Approves the gas consumption profiles and daily average consumption approved by ERSE for the period between July 2021 and June 2022;

- Directive n.º 11/2021, of 21 June - Approves the update of the energy tariff for the electricity sector;

- Directive n.º 12/2021, of 29 June - Approves the gas tariffs and prices for the gas year 2021-2022;

- Directive n.º 13/2021, of 19 July - Approves the new registration of Physical Units in the Balance Areas "Douro Superior" and "Douro Superior (Pumping)" and amends the Procedures Manual for Overall System Management for the electricity sector (MPGGS);

- Directive n.º 14/2021 of 19 July - Approves the entities qualified to integrate the commercialisation deviation unit under the terms of the Procedures Manual for Overall System Management;

- Directive n.º 15/2021, of 28 September - Approves the update of the energy tariff for the electricity sector;

- Directive n.º 16/2021, of 18 November - Approves the Implementation of the Ancillary Services Market;

- Instruction n.º 1/2021 - Implements the extraordinary support regime for electricity consumption;

- Instruction n.º 3/2021 - Instruction for the operationalisation of Article 8 of Decree-Law No. 76/2019, of 3 June, in the context of the commercial relationship of the Market Facilitator with the Transmission System Operator;

- Instruction n.º 4/2021 - Instruction relating to the transitory methodology for ascertaining the annual information on electricity labelling;

- Instruction n.º 5/2021 - Instruction to suppliers regarding the model of application for the exceptional and temporary suspension of essential services supply contracts in the context of the COVID-19 disease pandemic;

- Instruction n.º 6/2021 - Instruction to SU Electricity regarding the extinction of transitory tariffs on 31 December 2021;

- Instruction n.º 7/2021 - Instruction to the Integrated Guarantees Manager regarding the draft contracts and documentation required for the implementation of the Integrated Guarantees Manager;

- Instruction n.º 8/2021 - Instruction to the Transmission Network Operator regarding the suspension of the tax incidence measures in Spain within the scope of application of Decree Law n.º 74/2013, of 4 June;

- Instruction n.º 11/2021 - Instruction to the Supplier of Last Resort regarding the re-invoicing of compensations and payments within the scope of application of Decree-Law n.º 35/2013, of 28 February;

- Instruction n.º 12/2021 - Instruction to SU Eletricidade regarding the supply to customers of the supplier HEN - Serviços Energéticos, Lda.

- Instruction n. º 13/2021 - Instruction to the Logistics Operator for Supplier Switching, regarding supply to customers of the supplier HEN - Serviços Energéticos, Lda.

- Instruction n. º 14/2021 - Instruction to the electricity distribution network operators, regarding the supply to customers of the supplier HEN - Serviços Energéticos, Lda.

- Instruction n.º 15/2021 - Instruction to SU Eletricidade regarding the supply to customers of the supplier PH Energia, Unipessoal, Lda;

- Instruction n.º 16/2021 - Instruction to the Logistics Operator for Supplier Switching, regarding supply to customers of the supplier PH Energia, Unipessoal, Lda;

- Instruction n.º 17/2021 - Instruction for electricity distribution network operators, regarding supply to clients of the supplier PH Energia, Unipessoal, Lda;

- Instruction n.º 18/2021 - Instruction to the supplier PH Energia, Unipessoal, Lda;

- Instruction n.º 19/2021 - Instruction regarding the publication of the complementary standards of financial and operational reporting for the gas sector;

- Instruction n.º 20/2021 - Instruction to SU Eletricidade regarding the supply to customers without an assigned supplier following COVID-19 exceptional measures;

- Instruction n.º 21/2021 - Instruction to E-Redes - Distribuição de Energia, S.A. on the supply to customers without an assigned supplier following the COVID-19 exceptional measures;

- Instruction n. º 22/2021 - Instruction to the Logistics Operator for Supplier Switching regarding supply to customers without an assigned supplier following the COVID-19 exceptional measures.

Among these regulations, we highlight **Regulation n. º 180/2021, of 2 March**, which determined exceptional measures applicable to the conditions of the provision of energy supply services, as essential public services, during the state of emergency, which had been declared on 1 January 2021.

This decree-law follows the legal declaration of a state of emergency and its successive renewals, as well as the adoption of extraordinary measures that had already been adopted by ERSE[168] in the context of the epidemiological emergency caused by the COVID-19 pandemic.

The regulation in question, among other provisions, established : i) the obligation for suppliers to provide customers who are unemployed, have a household income drop of 20% or more or are infected with COVID-19 disease, whose supply is ensured, as the case may be, at normal low voltage or low pressure with annual consumption equal to or less than 10,000 m3(n), a plan for payment in instalments for bills issued from 1 January 2021 and for bills issued during the state of emergency, but in any case not later than 30 June 2021; ii) the fractioning of invoice values by suppliers to other customers, following unsettled invoice values, as long as they are normal low voltage or low pressure customers with an annual consumption equal to or less than 10 000 m3 (n); iii) in the case of customers with electricity supply and natural gas supply who are in a situation of business crisis related to the total or partial closure of their economic activity, to have the right, during the period of validity of the state of emergency, to change the power or capacity charges, the fixed tariff term and the energy to be invoiced; iv) split payment of the amounts owed by suppliers to network operators that correspond to those owed by customers covered by the application of the provisions of the same legal regime, as a charge for network access.

It should also be noted that through **Regulation n. º 836/2021**, of 7 September, part of the measures established in Regulation n. º 180/2021, of 2 March, were extended.

6.3 SANCTIONS REGIME

Within the scope of the Energy Sector Sanctioning Regime, approved by Law n. º 9/2013, of 28 January, 78 new complaints were received in 2021, in addition to the detection of offences by ERSE and the reports received from criminal police bodies and other public entities. Among the complaints received since 2018,

[168] In Regulation n.º 255 -A/2020 and Regulation n.º 356 -A/2020.

through the ERSE website, by the end of 2021, 41 complaints were arquived and 38 were part of administrative offence proceedings.

The main issues reported were commercial relationship, communication of meter readings and billing, unfair commercial practices (in particular, contracting of supply through aggressive practices), unjustified interruption of supply of electricity and natural gas, additional (bundled) services, commercial quality of service, delay in changing supplier (switching), and not making available the Complaints Book.

During 2021, 44 new administrative offence proceedings were also opened, as a result of the complaints and reports received. Additionally, on 1 January 2021, there were 64 ongoing administrative offence proceedings, as they had been carried forward from previous years.

Of these 64 administrative offence cases, seven concerned cases opened in 2015 regarding meter readings by gas distribution network operators, for which the regulations applicable at that time did not allow for their safe development; one case concerned the operator of the supplier switching process, for which no factual evidence had been gathered by that date that would allow any imputation. There was also a process in the judicial phase, relating to the effectiveness of telephone service.

In these terms, during 2021, ERSE dealt with a total of 108 administrative offence proceedings, including proceedings carried forward and open proceedings.

It should also be noted that, during 2021, ERSE presented 13 cases of illegality and decided 37 administrative offence proceedings, which resulted in 16 convictions with the application of a fine; 15 dismissals; three admonitions; one warning notice and three referrals of the proceedings to other entities. In the case of one administrative offence proceeding, there was both an admonition and a remittance of the proceeding to another entity (ASAE), given that the proceeding also contained matters within the jurisdiction of that entity.

Of the proceedings decided by ERSE in 2021, the following convictions stand out:

a) Imposition of a fine of 900 000 euros reduced to half, or 450 000 euros, per transaction. The company was condemned for failing to ensure, in accordance with legal provisions, its functional independence from other companies in the same economic group, by allowing the sharing of email addresses and human, technical and IT resources related to the management of that channel;

b) Imposition of a fine of 850 000 euros and reduced to 425 000 euros, given acknowledgement of negligent infringements, the measures presented and the compensation awarded to 49 customers who had suffered losses and who had not yet been compensated, in the total amount of 4 315 euros for interruptions to the supply of electricity and natural gas to consumers, outside the cases excepted or permitted by law;

c) Imposition of a fine of 752 000 euros by half, 376 000 euros, and the award of compensation to consumers who had suffered damages in the total amount of 5 620 euros per transaction. The company was convicted for interruptions to the supply of electricity and natural gas to consumers, outside the cases accepted or permitted by law;

d) Imposition of a fine of 72 000 euros reduced by half, that is 36 000 euros. The three consumers who had not yet been compensated for the interruption were attributed a total amount of 150 euros per transaction. The company was convicted for interruptions to the supply of electricity to consumers, outside the cases excepted or permitted by law;

The company was also sentenced to a fine of 5 000 euros for facts concerning the violation of legal rules regarding the interruption of the supply of natural gas and compliance with the frequency established for the annual verification of the adequacy of the consumption level of the natural gas installation. The company did not pay the fine and challenged ERSE's decision in court.

Furthermore, within the scope of the Unfair Commercial Practices Act, payments of 16 000 euros were made as administrative offences.

Reference should also be made to the payment of a fine to the value of 500 euros for the violation of rules related to the making of combined visits, this being the first conviction by ERSE for violation of this type of offence.

Proceedings against distribution network operators were also closed where there were indications of a breach of the practice of not providing suppliers with the readings communicated to them by customers. However, from the investigation carried out, it was possible to conclude that, in view of the legal framework existing at the time of the facts, there was no reasonable possibility of a condemnatory decision being issued against said companies, and it was therefore decided to close the administrative offence proceedings in question.

Furthermore, a case was filed against a company in its capacity as supplier switching manager, which was opened following an external audit. Within the scope of the investigation, no concrete situations were

identified which indicated that a specific infraction had materialised and the investigations carried out did not allow for the conclusion that there was a reasonable possibility that a condemnatory decision could be handed down.

With reference to the decisions taken during the year 2021, the total value of the fines imposed under the respective administrative offence proceedings was 2 611 800 euros, and the amount of fines actually collected corresponded to 1 324 800 euros.

Additionally, a fine of 36 000 euros was received within the scope of an administrative offence proceeding and, following the request for execution of the fine, corresponding to an ERSE decision issued in 2020, a fine of 3 750 euros was also received.

Therefore, in 2021, ERSE received a total of 1 364 550 euros in fines.

Furthermore, in 2021, compensation was awarded to consumers, under the settlement procedure, totalling 17 088.49 euros.

The maximum value of compensation awarded to a consumer was 1 000 euros and the minimum value of compensation awarded to a consumer was 50 euros.

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;

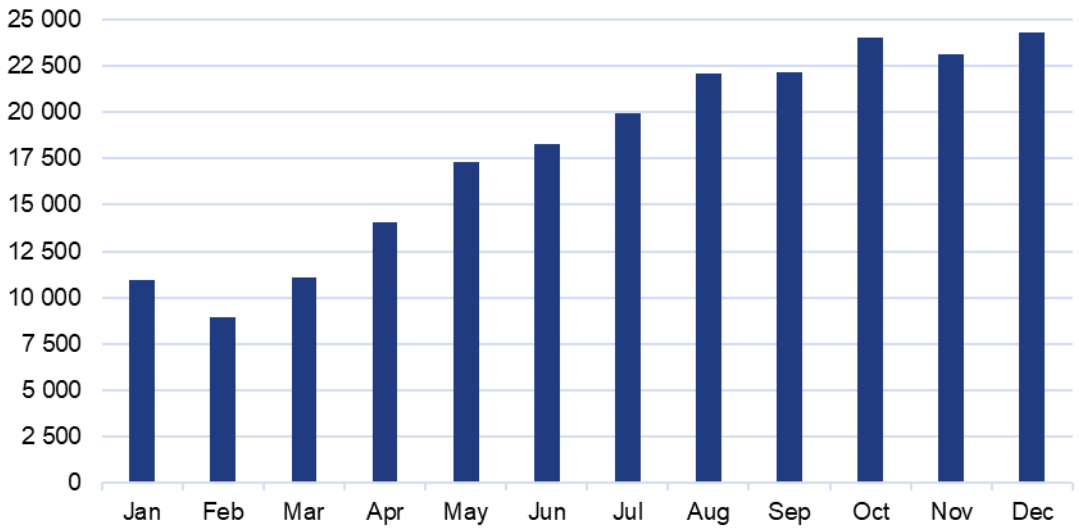
- Charging point operators (OPC) - entities responsible for charging points, charging a price established on a market basis. Users pay through their CEME, the only entity with whom they have a contract;

- 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 and technological updating, and about 4 959 charging points were available in December 2021.

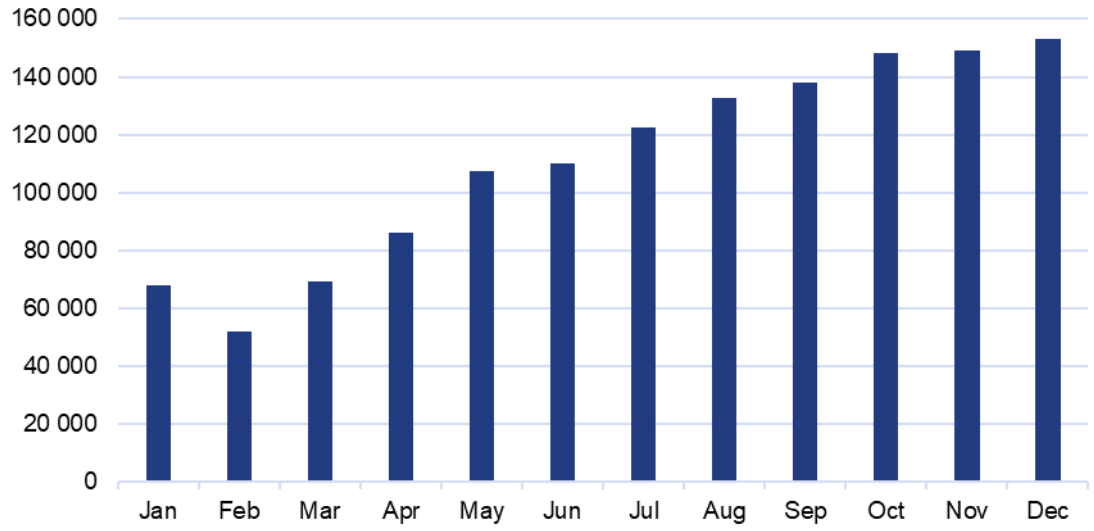
A set of figures with the evolution of the number of users, number of vehicle charges and amount of energy charged in the electric mobility network managed by EGME is presented below.

Figure 6-1 – Number of users in the electric mobility network, in 2021



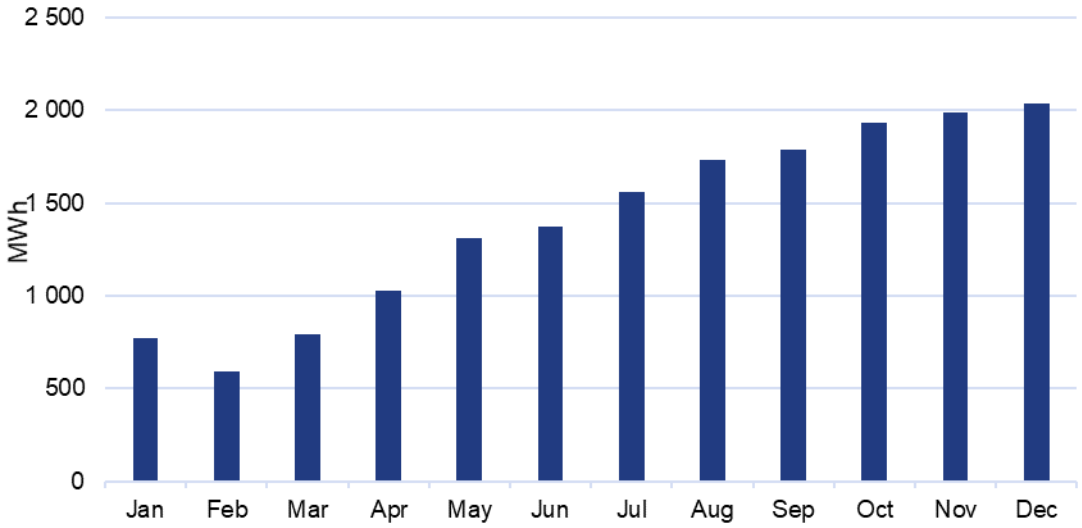
Source: MOBI.E, S.A.

Figure 6-2 – Number of vehicle charges in the electric mobility network, in 2021



Source: MOBI.E, S.A.

Figure 6-3 – Energy charged in the electric mobility network, in 2021



Source: MOBI.E, S.A.

ANNEXES

I. LIST OF ABBREVIATIONS AND ACRONYMS

- ACE - Energy Consumers Support Office in ERSE
- ACER - Agency for the Cooperation of Energy Regulators
- ASECE - Apoio Social Extraordinário ao Consumidor de Energia (Special Social Support to Energy Consumers)
- bcm - billion cubic meters
- CAE - Electricity Power Purchase Agreements
- CAPEX - Capital Expenditure
- CCGT - Combined Cycle Gas Turbine
- 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)
- DGEG - Directorate-General for Energy and Geology
- DSO - Distribution System Operator
- 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
- FBDP - Base Daily Operating Schedule
- FCFS - First Come First Served
- FID – Final Investment Decision
- FTR - Financial Transmission Rights
- GRI - Gas Regional Initiative
- GRMS - Gas Regulation and Measurement Station
- GWh - Gigawatt hour (energy unit)
- 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
- LNG - Liquefied Natural Gas
- 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
- 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
- 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
- OLMC – Switching Logistics Operation
- 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
- RARII - Access to Networks, Infrastructures and Interconnections Code
- REE – Red Eléctrica (Spain)
- REN - Rede Eléctrica Nacional, S.A.
- RNT - National Electricity Transmission Network
- RNTGN - National Natural Gas Transmission Network
- RNTIAT - National Gas Transmission Network, Storage Infrastructure and LNG Terminal Network
- RQS - Quality of Supply Code
- RRC - Commercial Relations Code

- RT - Tariffs Code
- SEN - National Electricity System
- SOLR – Supplier of Last Resort
- 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 REM - South West Europe Regional Electricity Market
- TERRE - Trans European Replacement Reserves Exchange
- TR - Real Time
- TSO - Transmission System Operator
- UVE - Electric vehicle user
- VIP - Virtual Interconnection Point

II. LIST OF LEGISLATION

A. NATIONAL LEGISLATION

In 2021, the following legal acts were published in Portugal with relevance for ERSE's activities:

- Directive n.º 16/2021, of 19 January - Revokes Directive n.º 498/2010, of 14 July, which classified the reservoirs of Fridão and Alvito;
- Decree Law n.º 8/2021, of 20 January - Updates the goals for incorporation of biofuels in fuels for consumption on national territory for 2021;
- Resolution of the Council of Ministers n.º 8-A/2021, of 3 February - Approves the Long-Term Strategy for Building Renewal;
- Rectification Statement n.º 5/2021, of 9 February - Rectifies the Regional Legislative Decree n.º 1/2021/M, of 6 January, which adapts to the Autonomous Region of Madeira the legal regime applicable to self-consumption of renewable energy;
- Order n.º 1632/2021, of 11 February - Defines, for the year 2021, the cash benefits due for the categories of petroleum products defined in paragraph 1 of Article 8 of Decree-Law n.º 165/2013, of December 16, as amended;
- Ordinance n. º 39/2021, of 22 February - Determines the marking procedure for professional gas oil used for supply at own consumption facilities;
- Order n.º 45-B/2021, of 2 March - First amendment to Order n.º 178-B/2016, of 1 July, which establishes the procedures, model and other conditions necessary for the application of the social tariff for the supply of electricity to economically vulnerable customers;
- Ministerial Order n.º 55/2021, of 11 March - Establishes rules on the evaluation criteria and procedures to be observed in the selection and ranking of the applications to the contests within the scope of the Plan for Promoting Efficiency in Energy Consumption (PPEC), and revokes Ministerial Order n.º 26/2013, of 24 January;

- Rectification Statement n.º 9/2021, of 16 March - Rectifies Ministerial Order n.º 39/2021, of 22 February, which determines the marking procedure for professional gas oil used for supply in own consumption facilities;

- Rectification Statement n.º 9-A/2021, of 19 March - Rectifies Decree-Law n.º 8/2021, of 20 January, which updates the targets for incorporation of biofuels in fuels for consumption in national territory for 2021;

- Ministerial Order n.º 118/2022, of 23 March - Suspends the updating of the rate of the addition on CO emissions (index 2) until 30 June 2022;

- Order n.º 3163/2021, of 24 March - Determines the social tariff for natural gas supply in 2021-2022;

- Order n.º 76/2021, of 1 April - Establishes the instructional elements for applications for production licences and operating licences for biomass power stations;

- Ministerial Order n.º 79/2021, of 7 April - Defines the criteria to be applied for the purposes of distribution to municipalities of the participation in the VAT revenue collected in the accommodation, catering, communications, electricity, water and gas sectors;

- Dispatch n.º 3759/2021, of 13 April - Extends the mandate of the working group created by Dispatch n.º 11814/2020, of 30 November;

- Decree-Law n.º 28/2021, of 20 April - Ensures the implementation of Regulation (EU) 2017/1369, which establishes an energy labelling scheme;

- Regional Regulatory Decree n.º 4/2021/A, of 26 April - Regulates the allocation of financial incentives for the introduction into consumption of new electric vehicles as well as the allocation of financial incentives for the acquisition of charging points for electric vehicles and sets the values and conditions for the allocation of financial incentives;

- Law n.º 29/2021, of 20 May - Exceptional and temporary suspension of essential services supply contracts in the context of the COVID-19 disease pandemic;

- Order n.º 5380/2021, of 28 May - Financial support for network access tariffs for electric mobility;

- Law n.º 37/2021, of 15 June - Support measure for electricity costs in the agricultural and livestock sector;

- Order n.º 6070-A/2021, of 21 June - Approves the regulation for the attribution of incentives of the 2nd phase of the Support Programme for More Sustainable Buildings;

- Rectification Statement n.º 463-A/2021, of 25 June - Rectifies Order n.º 6070-A/2021, published in the Official Gazette, 2nd series, 1st supplement, n.º 118, of June 21, 2021, which approves the Regulation for the allocation of incentives of the 2nd phase of the Support Programme for More Sustainable Buildings;

- Order n.º 6304/2021, of 25 June - Regulates the compensation made between 2013 and 2020 and the remuneration due to the wind power generating centres covered by Decree-Law n.º 35/2013, of 28 February;

- Order n.º 252-A/2021, of 29 June - Authorises the Energy Efficiency Fund to pay the costs of the "Sustainable HPC" project - Deucalion Supercomputer;

- Order n.º 6398-A/2021, of 29 June - Adjusts the value of the parameter that represents the impact of extra-market measures and events registered within the European Union on average electricity prices in Portugal;

- Ministerial Order n.º 138/2021, of 30 June - Defines the methodology for calculating the remuneration rate to be applied to the intertemporal transfer of allowed revenues relative to the over costs with the acquisition of electricity from producers in special regime;

- Order n.º 6476-C/2021 of 1 July - Approves the conditions regarding the maintenance of technical systems installed in buildings, the frequency and conditions for carrying out periodic inspection of technical systems and the model of the report;

- Order n.º 6476-D/2021, of 1 July - Approves the requirements for the preparation of the Plan for the Improvement of Energy Performance of Buildings (PDEE);

- Order n.º 6476-E/2021, of 1 July - Approves the minimum requirements for thermal comfort and energy performance applicable to the design and renovation of buildings;

- Order n.º 6476-H/2021, of 1 July - Approves the Manual of the System of Energy Certification of Buildings (SCE);

- Ministerial Order n.º 138-H/2021, of 1 July - Regulates the activities of the technicians and the competences of the managing entity of the Energy Certification System for Buildings and sets the values for the registration of energy certificates;

- Ministerial Order n.º 138-I/2021, of 1 July - Regulates the minimum energy performance requirements for building envelope and technical systems and their application according to the type of use and specific technical characteristics;

- Order n.º 6476-A/2021, of 1 July - Determines the remaining mandatory content of energy certificates, pursuant to the provisions of paragraph 4 of Article 20 of Decree-Law No. 101-D/2020, of 7 December;

- Order n.º 6476-B/2021, of 1 July - Approves the selection criteria and the methodologies applicable to the processes of verification of the quality of the information produced within the scope of the System for Energy Certification of Buildings (SCE);

- Order n.º 6546/2021, of 5 July - Approves the evaluation criteria related to objectives and instruments of energy policy and revokes Order no. 3739/2016, published in the Official Gazette, 2nd series, no. 51, of 14 March 2016;

- Order n.º 6560-B/2021, of 5 July - Establishes the rules for the transaction of guarantees of origin of electricity production from renewable sources, in accordance with the provisions of paragraph 8 of Article 9 of Decree-Law No. 60/2020, of 17 August;

- Decree Law n.º 56-B/2021, of 7 July - Alters the exceptional regime for situations of late payment of rent and establishes the guarantee of supply of essential services, within the scope of the COVID-19 disease pandemic;

- Ministerial Order n.º 280/2021 of 13 July - Authorises MOBI.E, S. A., a Reclassified Public Entity, to distribute the costs relative to the contract for the "Acquisition of development, implementation and operation services of a management platform for the MOBI.E network";

- Decree-Law n.º 59/2021, of 14 July - Establishes the regime applicable to the availability and disclosure of telephone lines for consumer contact;

- Regional Legislative Decree n.º 16/2021/M, of 27 July - Establishes the discipline applicable to additional power and additional energy, additional equipment and energy from additional equipment of wind power plants whose electricity is remunerated by a guaranteed remuneration regime;

- Decree Law n.º 67/2021, of 30 July - Establishes the regime and defines the governance model for the promotion of technology-based innovation through the creation of technological free zones;

- Regional Legislative Decree n.º 20/2021/M, of 4 August - Establishes the regime for the installation and exploration of forest biomass power plants in the Autonomous Region of Madeira;

- Decree Law n.º 70-A/2021, of 6 August - Establishes the rules for the guarantee of supply of essential services;

- Decree-Law n.º 71/2021, of 11 August - Ensures the execution of Regulation (EU) 2017/2394, on cooperation between national authorities responsible for the enforcement of consumer protection legislation;

- Order n. º 8068/2021, of 16 August - Amends Order N. º. 1897/2021, of February 15, approving the budget of the Environmental Fund for the year 2021;

- Law n.º 60/2021, of 19 August - Authorizes the Government to establish the requirements for access and exercise of the activity of technicians of the Energy Certification System of Buildings;

- Resolution of the Assembly of the Republic n.º 247/2021, of 19 August - Recommends to the Government to reinforce the incentives for the improvement of the energy efficiency of dwellings and the fight against energy poverty;

- Regional Legislative Decree n.º 23/2021/M, of 30 August - Adapts the Decree-Law n.º 101-D/2020, December 7, to the Autonomous Region of Madeira, which establishes the requirements applicable to buildings for the improvement of their energy performance and regulates the Building Energy Certification System;

- Order (extract) n.º 9067/2021, of 13 September - Amendment to Order n.º 6476-B/2021 which approves the selection criteria and methodologies applicable to the processes of verification of the quality of information produced within the scope of the System of Energy Certification of Buildings (SCE);

- Dispatch n.º 9241-B/2021 of 17 September - REN - Rede Eléctrica Nacional, S. A., as the overall manager of the national electricity system (SEN), is to implement a pilot model for the dynamic management of the national electricity transmission grid (RNT) at the injection point currently occupied by the Pego coal-fired thermoelectric power station;

- Order n.º 9241-C/2021, of 17 September - Determines the opening of the competitive procedure for the allocation of reserve capacity for injection into the Public Service Electricity Network of electricity produced exclusively from renewable energy source(s) in an generation plant with or without integrated storage;

- Order n.º 203/2021, of 28 September - Establishes an indirect cost aid measure in favour of facilities covered by the European Emissions Trading Scheme (EETS), under the terms of Decree-Law n.º. 12/2020, of 6 April;

- Dispatch n.º 9974/2021, of 14 October - Determines the final compensation to be applied for the year 2020 per unit of energy injected into the public service electricity grid;

- Dispatch n.º 9975/2021, of 14 October - Determines the parameter corresponding to the impact of extra-market measures and events registered within the European Union on the formation of average electricity prices in the wholesale market in Portugal, to be applied between 1 October and 31 December 2021;

- Order n.º 9977/2021, of 14 October - Fixes the social tariff for the supply of electricity, applicable from 1 January 2022;

- Order n. º 10190/2021, of 20 October - Amends Order n. º 8416/2019, of 23 September which proceeds to the constitution of the administrative easement, in favour of Iberdrola Generación, S. A. U., for the installation of electrical lines at 400 kV, within the scope of the implementation of the Tâmega Electricity Generating System;

- Law n.º 69-A/2021, of 21 October - Creates the possibility of fixing maximum commercialisation margins for simple fuels, amending Decree Law n.º 31/2006, of 15 February;

- Dispatch n.º 10376/2021, of 22 October - Extends the deadline set in paragraph 1 of Dispatch n.º 6453/2020, of 19 June, on the conditions for exemption from charges corresponding to costs of

general economic interest that fall on network access tariffs determined by the Energy Services Regulatory Authority;

- Dispatch n.º 10977-B/2021, of 9 November - Amends Dispatch n.º 1897/2021, of 15 February, which approves the budget of the Environmental Fund for the year 2021;

- Order n.º 11020-A/2021, of 10 November - Determines the start date and duration of the use phase of the "AUTOvoucher" benefit created by Decree-Law n.º 92-A/2021, of 8 November, as well as the minimum amount of eligible consumption and the percentage to be borne by that amount;

- Resolution of the Council of Ministers n.º 152/2021, of 12 November - Authorizes the expenditure related to the financial subsidy, of transitory and exceptional nature, to be granted to citizens for their consumption in the fuel sector;

- Resolution of the Council of Ministers n.º 153/2021, of 12 November - Creates an extraordinary and exceptional support to the public passenger transport sector with a view to mitigating the effects of the fuel price escalation;

- Decree-Law n.º 98/2021, of 16 November - Unifies the procedures for the production of electricity from the conversion of solar energy by floating photovoltaic electroproduction centres to be installed in reservoirs;

- Decree-Law n.º 102/2021 of 19 November - Establishes the requirements for access and exercise of the activity of technicians of the Energy Certification System of Buildings;

- Order n.º 11492/2021 of 22 November - Amends Order n.º 10233/2021 of 21 October, in view of the expansion of the "IVAucher" programme, so that consumption at petrol stations ("AUTOvoucher" benefit) can be considered to be processed through the same platform, reiterating the need to ensure adequate treatment in terms of personal data protection of all consumption covered under the programme as a whole;

- Ministerial Order n.º 262/2021, of 23 November - Approves the Regulations of the Incentive Scheme for Companies "Promotion of Sustainable Bioeconomy";

- Order n.º 11740-B/2021, of 27 November - Opening of a competitive procedure for the allocation of injection capacity reserve at connection points to the Public Service Electricity Grid for electricity

from solar energy conversion by floating photovoltaic electroproduction centres to be installed in reservoirs;

- Order n.º 11740-C/2021, of 27 November - Amends the incentive allocation regulations of the 2nd phase of the Support Programme for More Sustainable Buildings, approved by Order n.º 6070-A/2021, published in the Official Gazette, 2nd series, n.º. 118, supplement, of 21 June 2021, as amended;
- Order n.º 12020/2021, of 7 December - Establishes the rules for the functioning of the Consultative Commission (CC) which supports and follows the development of the allocation plan, with the objective of identifying new locations for ocean renewable energy and reviews the locations defined in the Plan for the Organisation of the National Maritime Space for the subdivision of the Continent (PSOEM);
- Decree-Law n.º 109-G/2021, of 10 December - Partially transposes Directive (UE) 2019/2161, regarding consumer protection;
- Order n.º 12081-A/2021, of 10 December - Approves the Regulation for the Compensation Mechanism for a Just Transition;
- Order n.º 12854-H/2021, of 30 December – Financial support to users of electric vehicles.

The following national legislation was taken into account in the preparation of this report:

- Law n. º 144/2015 of 8 September, which transposes Directive 2013/11/EU of the European Parliament and of the Council of 21 May 2013, on alternative resolution for consumer disputes, establishing a legal framework for out-of-court settlement mechanisms;
- Law n. º 75/2015 of 28 July, which governs the access to and exercise of the provision of audit services to cogeneration plants or to plants whose production is based on renewable energy sources;
- Law n. º 9/2013 of 28 January, which approves the Energy Sector Penalty System, transposing, together with the amendment to the Statutes of the Energy Services Regulatory Entity, Directives 2009/72/EC and 2009/73/EC of the European Parliament and of the Council of 13 July 2009, concerning common rules for the internal market in electricity and natural gas and repealing Directives 2003/54/EC and 2003/55/EC of the European Parliament and of the Council of 26 June 2003;

- Decree-Law n.º 57/2008, of 26 March, amended by Decree-Law n.º 205/2015, of 23 September, which establishes the legal regime applicable to unfair business-to-consumer commercial practices implemented before, during or after a commercial transaction related to a good or service, thus clarifying the transposition of Directive 2005/29/EC of the European Parliament and of the Council of 11 May 2005;

- Decree-Law n. º 68-A/2015 of 30 April, which sets out provisions with regard to energy efficiency and cogeneration production, transposing Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012, on energy efficiency;

- Decree-Law n. º 15/2015 of 30 January, which amends Decree-Laws n.º 74/2012 of 26 March; 75/2012 of 26 March; 66/2010 of 11 June, and 104/2010 of 29 September, which establish the framework for the phasing out of regulated tariffs. This diploma changes the way the period is set for the application of the corresponding transitional tariffs for the supply of natural gas and electricity to end-customers with annual consumption lower than or equal to 10,000 m3 and with standard low voltage consumption, and forbids suppliers on the liberalised market from indexing contractual prices to the transitional tariff for end-customers;

- Government Ordinance n. º 144/2017, of 24 April which amends Order n. º 59/2013, of 11 February which amends Order n. º 59/2013 of 11 February which approves the extension of the period of phasing out of transitional tariffs applicable to the supply of natural gas;

- Government Ordinance n. º 364-A/2017, of 4 December, which amends no. 2 of Order n. º 27/2014, of 4 February which amends the date provided for in nº 1 of article 6 of Decree-Law n.º 104/2010, of September, regarding the obligation of supplying electricity, by the supplier of last resort, to final customers consuming HV, MV, and SpLV (special LV)E that have not contracted their supply on the liberalised market;

- Decree-Law n. º 172/2014 of 14 November, which introduces the first amendment to Decree-Law n. º 138 -A/2010 of 28 December, which creates the social tariff for the supply of electricity, and the first amendment to Decree-Law n. º 102/2011 of 30 September, which creates the extraordinary social support for energy consumers, with the purpose of broadening the eligibility conditions for attributing the aforementioned social tariff to end-customers regarded as economically vulnerable;

- Decree-Law n.º 62/2020, of 28 August, which establishes the organization and operation of the National Gas System (SNG) and its legal regime, and transposes Directive (EU) 2019/692;

- Decree-Law n. º 231/2012 of 26 October, which introduces the third amendment to Decree-Law n. º 140/2006 of 26 July and concludes the transposition of Directive 2009/73/EC of the European Parliament and of the Council of 13 July, concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC of the European Parliament and of the Council of 26 July;

- Decree-Law n.º 15/2022, of 14 de January which establishes the organization and operation of the Eletrical Sector and its legal regime, and transposes Directive (EU) 2019/944;

- Decree-Law n. º 215-A/2012 of 8 October, which introduces the fifth Amendment to Decree-Law n.º 29/2006 of 15 February, transposing Directive 2009/72/EC of the European Parliament and of the Council of 13 July, concerning common rules for the internal market in electricity;

- Decree-Law n. º 76/2019, of 3 July amending Decree-Law n.º 172/2006 of 23 August, amended by Decree-Law n. º 215-B/2012 of 8 October and completes the transposition of Directive 2009/72/EC of the European Parliament and of the Council of 13 July, concerning common rules for the internal market in electricity;

- Parliamentary Resolution n. º 23/2006, of 23 March, which approves 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.

- Resolution of the Council of Ministers n. º 20/2013, of 10 April, which approves the National Energy Efficiency Action Plan for the period 2013-2016 and the National Renewable Energy Action Plan for the period 2013-2020;

- Government Ordinance n. º 643/2015 of 21 August, which establishes the percentages of the shareholdings of different companies in MIBGAS, S. A., the company that is authorised to manage the organised gas spot market, as part of the creation of the Iberian Natural Gas Market (MIBGAS);

- Government Ordinance n.º 178-B/2016, of 1 July, which establishes the procedure,s model and other necessary conditions for the application of the revisions to Article 6 of Decree-Law n.º 138-A/2010, of 28 December, altered by Decree-Law n.º 172/2014, of 14 November and by Law n.º 7-

A/2016, of 30 March, which create the sole and automatic model for the attribution of the social tariff for energy supply to economically vulnerable customers;

- Government Ordinance n. º 108-A/2015 of 14 April, which defines the mechanism for determining the aggravating factor included in the transitional tariff to end-customers of natural gas;

- Government Ordinance n. º 97/2015 of 30 March, which approves the new dates of the period for applying transitional sale tariffs to end-customers for natural gas with annual consumptions equal to or lower than 10,000 m3 and for electricity with consumptions in normal low voltage;

- Government Ordinance n. º 251-B/2014 of 28 November, which introduces the second amendment to Order n. º 332/2012 of 22 October, concerning the criteria for the differentiated impact of costs arising from measures related to energy, sustainability or general economic interest policies on the tariff for the global use of the system applicable to activities covered by the National Electricity System;

- Regulation n. º 416/2016 of 29 April, which approves the Commercial Relations Code for the natural gas sector amended by Regulation no. 224/2018 of 16 April and Regulation n.º. 387/2018 of 22 January;

- Regulation n. º 632/2017 of 21 December, which approves the Commercial Relations Code for the electricity sector;

- Regulation n.º 1129/2020, of 30 December - Approves the Commercial Relations Code for the Electricity and Gas Sectors and revokes Regulation n.º. 561/2014, of 22 December, and Regulation n.º. 416/2016, of 29 April;

- Regulation n. º 361/2019 of 23 April, which approves the Tariffs Code for the natural gas sector;

- Regulation n. º 619/2017 of 18 December, which amends the Tariffs Code for the electricity sector;

- Regulation n. º 620/2017 of 18 December, which amends the Access to Networks, Infrastructures and Interconnections Code for the electricity sector;

- Regulation n. º 621/2017 of 18 December, which amends Operation of Electricity Sector Networks Code;

- Regulation n. º 629/2017 of 20 December, which approves the Quality of Service Code for the electricity and natural gas sector;

- Regulation n. º 362/2019 of 23 April - Amendment to the Code on Access to Natural Gas Networks, Infrastructure and Interconnection;

- Directive n. º 5/2016 of 26 February, of ERSE, which approves the Guidelines for Measuring, Reading and Disclosing Electricity Data in mainland Portugal;

- Directive n. º 15/2015 of 9 October, of ERSE, which establishes commercial margins for the market agents;

- Directive n. º 8/2015 of 27 May, of ERSE, which details the operative procedures for the application of these adjustments;

- Directive n.º 6/2015 of 27 April, of ERSE, concerning the provision of pre-contractual and contractual information to electricity consumers, which provides for the obligation to disclose and harmonise the contents of the conditions for the provision of pre-contractual and contractual information to electricity consumers in mainland Portugal;

- Directive n.º 7/2020, of 21 April, which approves the first amendment to the Procedures Manual for Access to Natural Gas Infrastructures;

- Order n.º 8810/2015 of 10 August, of the Directorate-General for Energy and Geology, which lays down the necessary rules and procedures to establish a discipline for the interruption of generation under the special regime, namely the order and sequence of the power reduction to be complied with by the special-regime generating plants connected to the RNT or the RND;

- Order n.º 10835/2020, of 4 November - Reduction of power of production under the special regime that benefits from a guaranteed remuneration regime or another subsidised remuneration support regime;

- Order n. º 3677/2011, of 24 February, of ERSE, which establishes the monitoring of reference prices and average prices charged by natural gas supplies, in order to define the information requirements to be met by the suppliers as regards the calculation and disclosure of both the reference prices that the suppliers expect to charge in the market and the average prices that are effectively charged;

- Order n. º 18637/2010 of 15 December, of ERSE, which establishes the monitoring of reference prices and average prices charged by electricity suppliers, in order to define the information requirements to be met by suppliers as regards the calculation and disclosure of both the reference prices that the suppliers expect to charge in the market and the average prices that are effectively charged. This order amends Order n. º 9244/2009, introducing some changes in the methodology for calculating reference prices and of the average prices that are charged;

- Decision n. º 1/2014, of 21 February, of ERSE, which approves the processes for the allocation of capacity in the virtual point of natural gas interconnection between Portugal and Spain;

- Directive n.º 7/2018, of 28 March - Natural Gas Sector Measurement, Reading and Data Availability Guide;

- Regulation n.º 610/2019, of 2 August - Approves the Code on Smart Grid Services;

- Regulation n. º 854/2019, of 4 November - Approves the Electric Mobility Code;

- Regulation n.º 255-A/2020, of 18 March - Approves the Code establishing Extraordinary Measures in the Energy Sector due to Epidemiological Emergency Covid-19;

- Regulation n.º 266/2020, of 20 March - Approves the Code on Self-Consumption of Electricity;

- Regulation n. º 356-A/2020, of 8 April - Approves the Code establishing exceptional measures in the scope of the SEN.

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 scheme 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 (UE) 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 (UE) 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/UE;
- Commission Regulation (UE) 2015/1222 of 24 July 2015 laying down guidelines for capacity allocation and congestion management;
- Commission Regulation (UE) 2015/703 of 30 April 2015 establishing a network code for interoperability and data exchange rules;
- Commission Implementing Regulation (UE) 1348/2014 of 17 December 2014 on data reporting implementing Article 8(2) and (6) of Regulation (UE) 1227/2011 of the European Parliament and of the Council on integrity and transparency in wholesale energy markets;
- Commission Regulation (UE) 543/2013 of 14 June 2013 on the submission and publication of data from electricity markets and amending Annex I to Regulation (CE) 714/2009 of the European Parliament and of the Council;
- Commission Regulation (UE) 2017/2195 of 23 November 2017 setting out guidelines on electricity system balancing;
- Commission Regulation (EU) 2017/459 of 16 March 2017 establishing a network code on capacity allocation mechanisms in gas transmission systems and repealing Regulation (EU) No 984/2013
- Regulation (UE) 1227/2011 of the European Parliament and of the Council of 25 October 2011 on wholesale energy market integrity and transparency (REMIT);
- Regulation (UE) 2017/1938 of the European Parliament and of the Council concerning measures to safeguard security of gas supply and repealing Regulation (UE) 994/2010;
- 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 (EE) No

1775/2005 as amended by Regulation (UE) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on Energy Union Governance and Climate Action, amending Regulations (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/UE, 2012/27/UE and 2013/30/UE of the European Parliament and of the Council, Directives 2009/119/CE and (UE) 2015/652 of the Council, and repealing Regulation (UE) 525/2013 of the European Parliament and of the Council;

- Regulation (UE) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the internal market in electricity (recast);
- Regulation (UE) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on Energy Union Governance and Climate Action;
- Regulation (UE) 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/EC;
- Regulation (UE) 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);
- Directive (UE) 2018/844 of the European Parliament and of the Council of 30 May 2018 amending Directive 2010/31/UE on the energy performance of buildings and Directive 2012/27/UE on energy efficiency;
- Directive (UE) 2018/2002, of the European Parliament and of the Council, of 11 December 2018, amending Directive 2012/27/UE on energy efficiency;

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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