



ANNUAL REPORT ON THE ELECTRICITY AND NATURAL GAS MARKETS IN 2018

PORTUGAL

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1 FOREWORD

Europe's electricity and gas markets are going through an important transition. Ensuring a greater level of competition, whilst ensuring a sustainable and secure energy supply and pursuing the best interests of actual and future consumers, are the current challenges.

At European level, 2018 was marked by the negotiation of the legislative package on "Clean Energy for All Europeans", presenting an important challenge in terms of cooperation, both seeking to promote the energy transition and to convey confidence to consumers and market agents, as well as establish clear regulatory rules.

The Portuguese Energy Services Regulatory Authority (ERSE, Entidade Reguladora dos Serviços Energéticos)¹ cooperates on a regular basis with the Council of European Energy Regulators (CEER) and with the Agency for the Cooperation of Energy Regulators (ACER) in order to achieve an internal energy market.

Considering the interconnection of the national market with Spain, ERSE cooperates closely with the Spanish regulator, through the Board of Regulators of the Iberian Electricity Market (MIBEL), as well as in the framework of coordinated management of the interconnection Portugal-Spain. ERSE also cooperates with the Spanish and the French regulators within the Southwest European Region (SWE), within the context of the integration of the Iberian Electricity Market in the European market.

The report presents the main developments in the electricity and natural gas markets in Portugal in 2018, including topics such as competition, both in the wholesale and in the 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 2018. The report also includes regulatory initiatives with an impact on future developments in the markets.

For the electricity sector in particular, the report reflects, whenever applicable, the situation in mainland Portugal as well as the archipelagos of the Azores and Madeira. For the natural gas sector, the report only

¹ The body responsible for regulating the natural gas and electricity sectors in Portugal.

describes the market in mainland Portugal as there is no natural gas supply to end-consumers on the islands.

2 MAIN DEVELOPMENTS IN THE ELECTRICITY AND NATURAL GAS SECTORS

The electricity and natural gas sectors have progressed in 2018 as described below.

Generation and energy demand

In mainland Portugal, the hydrological conditions were favourable in 2018 for electricity generation with a hydrological index of 1.05. The proportion of hydro generation in the mix was 22%, corresponding to a growth of 12% compared to 2017. Renewable generation besides hydro generation maintained the same level of 2017 with wind generation representing 22% of total generation.

In 2018, non-renewable thermal power plants accounted for 47% of the electricity production in mainland Portugal, less than the 58% of 2017, with 20% from coal-fired power plants and 26% from natural gas-fired plants.

Concerning combined cycle natural gas, there was a significant overall decrease in production in 2018 compared to 2017. This decrease was around 3.3 TWh in absolute terms, while coal-fired power plants decreased by around 2.5 TWh in absolute terms compared to the previous year.

With regard to new investments in production, during 2018 there were no developments in the thermal park, while in the hydroelectric park there was a 22 MW entry, which does not represent a significant increase.

In terms of national electricity consumption, 2018 was characterised by an increase of 2.5% compared to 2017. In the natural gas sector, consumption increased by 5% compared to 2017 in the conventional market and decreased by 25% in the electrical power market (power plants).

Renewable Energy Sources / Distributed generation

In 2018, the installed capacity in power plants from renewable sources was 68% of the total installed power of the Portuguese electricity system.

The production of electricity from renewable sources represented 53% of the total electricity produced, which between 2014 and 2018 has ranged between 40% and 62%.

In 2018, about 150 MW of new market-based installed capacity came from distributed generation, made up of mini-hydro (26%), photovoltaic (59%), wind (12%) and thermal technologies (2%).

Electricity and natural gas retail markets

In the electricity retail market, the consolidation of the market's liberalisation continued, both in overall electricity consumption and in the number of customers.

Structural factors such as the abolition of regulated end-user tariffs and the adoption of transitional tariffs, the adherence by suppliers to regulated risk coverage mechanisms and increased transparency in communication to end-consumers of the available offers in the market, continue to allow new entrants to operate in the liberalised market.

By the end of 2018, electricity consumption with free market contracts represented more than 94% of total consumption, 1% more than in 2017. Regarding natural gas, with the exception of electricity power plants, about 97% of consumption was in the liberalised market, representing about 1.2 million customers.

In the electricity market, at the end of 2018, there were 29 free market suppliers, of which 26 served residential customers and small companies (with contracted power up to 41.4 kVA). In the natural gas market, 12 suppliers were present, all serving customers with a consumption less than or equal to 500 m³/year.

Since 2018, a new 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 new regime, customers can opt to be supplied by the supplier of last resort. However, this new regime did not have substantive effects in terms of the return of consumers to the supplier of last resort.

Wholesale electricity and natural gas markets

Concentration in the electricity generation market increased due to the hydrological regime, favorable to hydro production (and since the hydroelectric power plants are more concentrated in terms of market agents).

The increase of the hydrological index led, among other factors, to an increase in the price differential between the Portuguese and Spanish MIBEL price areas compared to 2017.

The trend of a reduction in the volume traded in the forward electricity Iberian market was noteworthy. This trend is related to the transaction of competing products in other European forward markets.

In 2018, there were no significant changes in the management of the interconnection between Portugal and Spain, namely in the capacity allocation model, which was exclusively allocated to MIBEL's day-ahead and intraday markets. A price differential risk management mechanism is in place, implemented through by transmission operators offering financial products to protect against the risk of price decoupling between market areas.

In 2018, work continued on the approval and implementation of the terms, conditions or methodologies provided in the European regulations and it is expected that the implementation of these standards will have a direct influence on congestion management mechanisms and available capacity allocation in the electricity interconnections.

On 28 December 2018, ERSE approved the rules for the pilot project on participation of demand in the secondary reserve market. This pilot project will test the participation of demand in the ancillary services market, on equal terms with electricity producers.

In 2017, the mechanism for the annual review of the 'Costs for the Maintenance of Contractual Equilibrium' (CMEC) ended. This mechanism covered a number of electricity generators with power purchase agreements in place before market liberalisation. Decisions associated with the implementation of this legal mechanism led to the launch of litigation actions in 2018 by the parties concerned, which are continue to be pursued according to the formal procedures.

Also in the context of the wholesale electricity market, a potential acquisition of an electricity generator by a foreign state-owned company was the object of a regulatory pronouncement within the ambit of the transmission system operator's (TSO) certification obligations. However, the operation was abandoned and was concluded with another market agent.

Regarding the natural gas wholesale market, the Portuguese market is supplied through the interconnection with Spain and by the liquefied natural gas (LNG) terminal installed in the Port of Sines, based on long-term gas contracts. In 2018, approximately 62% of the natural gas supply was delivered by the LNG terminal.

In 2018, ERSE initiated a public consultation process which led to a reasoned decision on the rules for harmonised structures for gas transmission tariffs, including rules on the application of a reference price methodology, publication and consultation requirements, as well as the calculation of the reserve prices for standard capacity products. This decision implements the European Network Code on Natural Gas Transmission Tariffs.

Finally, in the natural gas wholesale market, there were no relevant developments in the implementation of the Iberian gas market (MIBGAS). This constraining situation has implications for the functioning of the gas market, although the interconnection was used for cross-border exchanges without restrictions.

Network Access

In February 2018, ERSE approved the rules for two pilot projects on tariff structure improvement and on dynamic tariffs for network access on the very EHV, HV and MV lines² in mainland Portugal. The objective of the first pilot project is to evaluate the benefits associated with the improvement of network access tariffs, testing issues such as price differentiation within the peak period and the definition of new tariff periods more suited to transferring network costs. In the second pilot project, the regulator intends to test the introduction of a new dynamic network access tariff.

Nature of the Report

This report complies with the provisions of Directives 2009/72/EC (electricity) and 2009/73/EC (natural gas) of the European Parliament and of the Council, both of 13 July 2009. These Directives dictate that regulators must annually inform the national authorities, the European Commission and the Agency for the Cooperation of Energy Regulators (ACER) of their activities and of any developments observed in the electricity and natural gas markets.

National legislation, namely Decree-Law N.º 215-A/2012 of 8 October, and Decree-Law N.º 230/2012 of 26 October, also require ERSE to prepare an annual report on the functioning of the electricity and natural gas markets and on the degree of the effective competition within those markets. Accordingly, ERSE must send its report to the member of the Government responsible for energy, to the Portuguese Parliament and to the European Commission. The report must also be published.

The structure of this report is harmonised within the framework of the Council of European Energy Regulators (CEER).

² Extra high voltage (EHV), high voltage (HV) and medium voltage (MV)

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 the Network Operation Code (ROR)³, and in the Manual of Procedures for Global Technical System Management for the Electrical System (MPGGS)⁴.

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

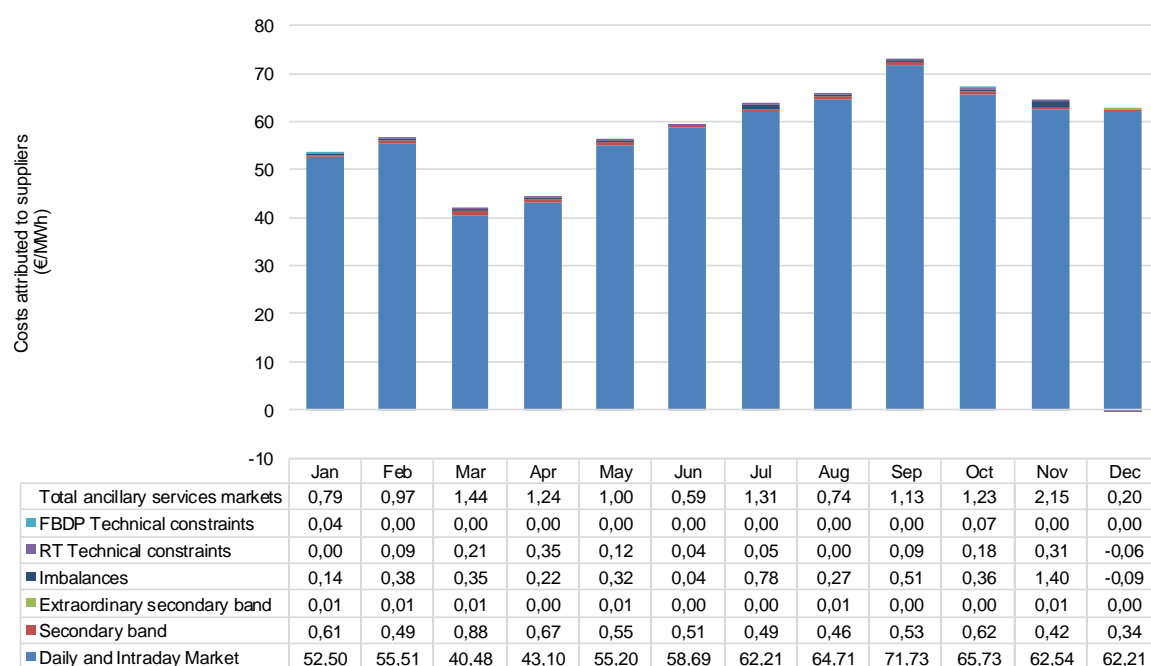
Figure 3-1 shows the impact of the daily, intraday and ancillary services markets on the costs allocated to suppliers in 2018, including the breakdown of daily and intraday market share and of the ancillary services market. Figure 3-1 also illustrates that the price of the ancillary services market can be mainly explained by the cost of secondary band contracting and imbalance, with less impact on the remaining components.

The ancillary services market represented, in 2018, a weighted average cost of approximately 1.56 €/MWh, against a weighted marginal price in the daily and intraday markets of approximately 57.88 €/MWh, which reflects an increase in the average market price of nearly 10% compared to the previous year (adding to the 30% increase which occurred in 2017), contrasting with the average cost of the ancillary services market, which declined by 8% (adding to the 30% decrease which occurred in 2017).

³ Network Operation Code (ROR) was approved by ERSE Regulation n.º 621/2017, published in Diário da República, 2.ª série, of 18 December, amending Network Operation Code (ROR), approved as part of Regulation no 557/2014, of 19 December, following a public consultation held by ERSE.

⁴ ERSE Directive n.º 9/2014, published in Diário da República, 2.ª série, of 15 April.

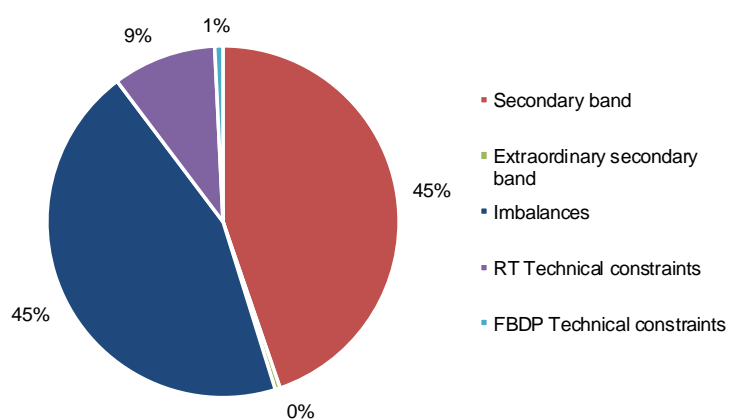
Figure 3-1 - Impact of daily, intraday⁵ and ancillary services markets on the costs allocated to suppliers operating in Portugal, in 2018



Source: REN data. Note: PDBF - Base Daily Operating Schedule and TR - Real Time.

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

Figure 3-2 - Breakdown of costs of the ancillary services market, 2018

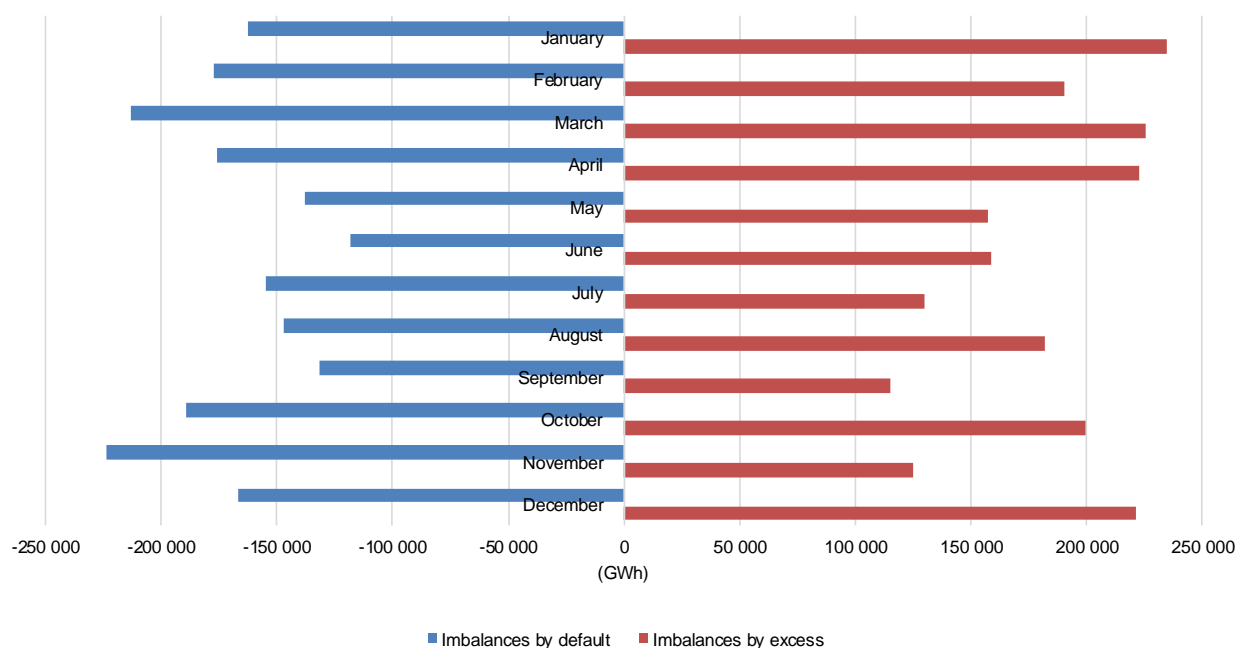


Source: REN data

⁵ Excludes the intraday and continuous market, as a result of the application of the model provided for in the CACM GL (XBID).

The monetary value of imbalances for each hour corresponds to the variable costs of regulation, 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 excess⁶ and by deficit⁷, observed throughout 2018. Compared to 2017, there was a significant decrease in deficit imbalances and a slight increase in excess imbalances.

Figure 3-3- Evolution of imbalances, 2018



Source: REN data

3.1.1.2 TECHNICAL QUALITY OF SUPPLY

In Mainland Portugal and in the Autonomous Regions of the Azores and Madeira, both the Quality of Supply Code (RQS)⁸ and the Tariffs Code (RT)⁹ include provisions for regulating the continuity of supply¹⁰.

⁶ Each hourly surplus imbalance is the result of consumption lower than previously scheduled (consumers' imbalance), or the result of generation higher than previously scheduled (generation units' imbalance).

⁷ 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).

⁸ Regulation n.º 629/2017 of 20 December, which approves the Quality of Supply Code for the electricity sector and the corresponding Procedures Manual.

⁹ Regulation n.º 619/2017 of 18 December, which approves the Tariff Code for the electricity sector.

¹⁰ In addition to this technical quality, the RQS also establishes obligations related to voltage quality and commercial quality.

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 2III).

The RQS establishes that the assessment of the performance of the transmission and distribution network, in terms of continuity of supply, applies not only to long interruptions (longer than 3 minutes) but also to short interruptions (between 1 second and 3 minutes), according to the MAIFI indicator (see the indicator definition list in Annex 2III). Table 3-1 shows the continuity of supply indicators for Mainland Portugal in 2018¹¹.

Table 3-1 - Continuity of supply indicators in Mainland Portugal, 2018

Voltage Level	Indicator	Interruptions		
		Planned	Unplanned	
			Operator Responsibility	Exceptional Events
Transmission	TIE (min)	-	0.03	-
	SAIFI (int)	-	0.02	-
	SAIDI (min)	-	0.13	-
	MAIFI (int)	-	0.05	-
HV Distribution	SAIFI (int)	0	0.19	0.08
	SAIDI (min)	0	44.40	1542.40
	MAIFI (int)	0	1.37	0.18
MV Distribution	TIEPI (min)	0.08	57.51	80.32
	SAIFI (int)	0	1.77	0.46
	SAIDI (min)	0.05	84.95	146.05
	MAIFI (int)	0	11.57	0.79
LV Distribution	SAIFI (int)	0	1.55	0.35
	SAIDI (min)	0.23	80.98	119.65

Source: REN and EDP Distribuição data

¹¹ Information on the historical evolution of the continuity of supply indicators is available at (in Portuguese): <http://www.erse.pt/pt/electricidade/qualidadedeservico/relatoriodaqualidadedeservico/>
<https://infogstecnica.erse.pt/>

Overall, in 2018, the continuity of supply indicators which assess the performance of the transmission network follow the trend of a progressive and sustained improvement in the performance of the transmission network, as verified in previous years. On the other hand, the continuity of supply indicators that assess the performance of the distribution networks suffered a degradation in their generality compared to the previous year. This degradation was due to the occurrence of extreme natural events that raged across Mainland Portugal in 2018.

Additionally, 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 compensation¹² without the need for the customer to request it.

In 2018, there were 46,546 instances of non-compliance in Mainland Portugal, 46,000 of which were related to the duration of the interruptions and 546 to the number of interruptions. Customers received 648,000 euros in compensation for failure to comply with these indicators.

In 2017, there were 13,495 instances of non-compliance related to the duration of interruptions and only one regarding the number of interruptions, the largest share of which was related to non-compliance that affected medium voltage customers. Customers received 151,000 euros in compensations.

Table 3-2 shows the continuity of supply indicators for the Autonomous Region of the Azores, in 2018.

¹² 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.

Table 3-2 - Continuity of supply indicators in the Autonomous Region of the Azores, 2018

Voltage Level	Indicator	Interruptions		
		Planned	Unplanned	
			Operator Responsibility	Exceptional Events
MV Distribution	TIEPI (min)	42.06	78.58	5.70
	SAIFI (int)	0.69	6.24	0.21
	SAIDI (min)	52.36	110.37	8.74
	MAIFI (int)	0.90	1.52	0.01
LV Distribution	SAIFI (int)	0.28	3.36	0.04
	SAIDI (min)	8.09	57.50	1.21

Source: EDA data

In 2018, the continuity of supply indicators that assess the performance of distribution networks in the Azores improved in general compared to the previous year. Data for instances of non-compliances were not yet available for the Azores at the time of publication. In 2017, there were 813 instances of non-compliance, of which 29 related to the duration of interruptions and 784 related to the number of interruptions. The instances of non-compliance were mainly due to incidents that affected low voltage customers (763). Customers received 5,000 euros in compensation.

Table 3-3 shows the continuity of supply indicators for the Autonomous Region of Madeira, in 2018.

Table 3-3 - Continuity of supply indicators in the Autonomous Region of Madeira, 2018

Voltage Level	Indicator	Interruptions		
		Planned	Unplanned	
			Operator Responsibility	Exceptional Events
MV Distribution	TIEPI (min)	10.00	26.71	18.80
	SAIFI (int)	0.21	0.88	0.15
	SAIDI (min)	15.18	36.23	33.41
	MAIFI (int)	0.05	0.50	0.03
LV Distribution	SAIFI (int)	0.21	0.79	0.11
	SAIDI (min)	17.23	31.21	14.96

Source: EEM data

In 2018, the continuity of supply indicators that assess the performance of distribution networks deteriorated compared to the previous year. The occurrence of relevant atmospheric phenomena as well as an increase in the impact of exceptional events contributed to this result.

In 2018, there were 213 instances of non-compliance related to the duration of the interruptions, mostly due to non-compliance at standard low voltage customers (StLV), and customers received about 4,000 euros in compensation. In 2017, there were 45 instances of non-compliance, of which 41 related to the duration of the interruptions, mostly due to non-compliance at StLV, and customers received about 2,000 euros in compensation.

It should be noted that, in accordance with the RQS for the electricity sector, ERSE publishes a quality of supply report on a yearly basis¹³, 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 2018, 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 events¹⁴.

¹³ Available at: <http://www.erse.pt/pt/electricidade/qualidadedeservico/relatoriodaqualidadedeservico/>

¹⁴ The RQS approved in 2013, which entered into force in 2014, 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, last-resort suppliers or, in the case of the Autonomous Regions of the Azores (RAA) and Madeira (RAM), producers, avoid all of its consequences;

"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 2018, 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.

Concerning the amount of the incentive to improve continuity of supply, it should be noted that in 2018, the value of non-distributed energy was lower than the reference value set for the regulation period. The incentive received by the distribution network operator represented about 1.08 million euros.

3.1.1.3 CONNECTIONS TO NETWORKS

The regulatory framework for the commercial conditions governing connections to the electricity network is set out in the electricity Commercial Relations Code (RRC), approved by ERSE, modified during 2017, based on a public consultation as part of the regulatory review process for the 2018-2020 regulatory period. It entered into force on 1 January 2018. If on the one hand the rules already in place for small facilities¹⁵ were generally maintained, on the other hand important amendments were adopted for generation and for large facilities¹⁶, namely related to connection charges.

Indeed, part of the network charges these petitioners had to bear were set by mutual agreement with the network operators. The mutual agreement approach had the main virtue of accommodating each connection's particularities raising, however, questions on transparency and equity levels concerning the treatment of similar requests and of requests for connection of small facilities.

Additional points worth mentioning when it comes to establishing clear, balanced and sustainable cost sharing rules are the maturity level of the electrical sector, cost recovery by means of tariffs, distributed

-
- The event and its consequences are not attributable to network operators, suppliers, last-resort suppliers 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 last-resort suppliers.

¹⁵ LV and MV up to 2 MVA of the capacity requested.

¹⁶ EHV, HV and MV above 2 MVA of the capacity requested.

generation, network planning process and developments in the legislative framework. Therefore, the regulator tried to set up a harmonised regulatory framework for generation and consumption facilities, irrespective of the voltage level.

The approval of some regulatory procedures that were still missing took place at the beginning of 2019.

Another important amendment from the regulatory review process was the establishment of network connection execution deadlines for the operators that, if not observed, oblige the operators to pay petitioners a financial compensation for the delay, as established under the RQS.

Otherwise, the regulatory framework as described in previous reports remained unchanged, namely concerning mandatory third party access, type of charges that can be levied on petitioners, rules for calculating network connection charges, construction and property of the network connection elements or provision of information.

3.1.1.4 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 measures¹⁷. In 2018, there were no incidents that required implementing safeguard measures.

3.1.1.5 RENEWABLE ENERGY SOURCES

As part of the application of the European Directive on this matter¹⁸, the concept of renewable energy sources in Portugal is linked to special regime generation (SRG)¹⁹.

¹⁷ Article 33-B of Decree-Law n.º 215-B/2012 of 8 October, which introduces the sixth amendment to Decree-Law n.º 172/2006 of 23 August, 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 electricity internal market.

¹⁸ Directive 2009/72/EC, concerning common rules for the internal market in electricity; Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009, on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC.

¹⁹ Article 18(1) of 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, amended by Decree-Laws n.º 104/2010 of 29 September, 78/2011 of 20 June, 75/2012 of 26 March, and 112/2012 of 23 May, transposing Directive 2009/72/EC.

Special regime generation is defined as the production of electricity from endogenous resources, renewable or non-renewable, combined heat and power technologies and distributed generation.

Also regarding SRG, we should mention Order n.º 8810/2015 of 10 August, of the Directorate-General for Energy and Geology (DGEG)²⁰, which 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 is at stake, the system manager shall send reduction orders with the purpose of controlling SRG facilities so they do not exceed a specific power value.

In Mainland Portugal, SRG energy that is subject to a special legal regime, with guaranteed remuneration, must be purchased by the supplier of last resort (SLR), through the application of *feed-in tariffs*²¹. The remuneration differentiation of this SRG, in the current legal framework, depends on the generation technology.

The selling price to the SLR can be one of the following:

- The price resulting from the application of the tariffs published by the Government;
- The price resulting from the bid submitted during tenders for the allocation of connection points for wind, biomass and small scale production facilities. In these tenders, the discount on the tariff published by the Government is one of the weighted factors.

The Government-published prices are based on an avoided cost approach, seeking to quantify them in terms of power (investment in new facilities), energy (cost of fuel) and environment (valuing avoided CO₂ emissions), and also on a differentiation logic in accordance with the generation technology or primary source of energy used. Therefore, the producer's remuneration depends on the delivery period to the network of the electricity and on the primary energy source used.

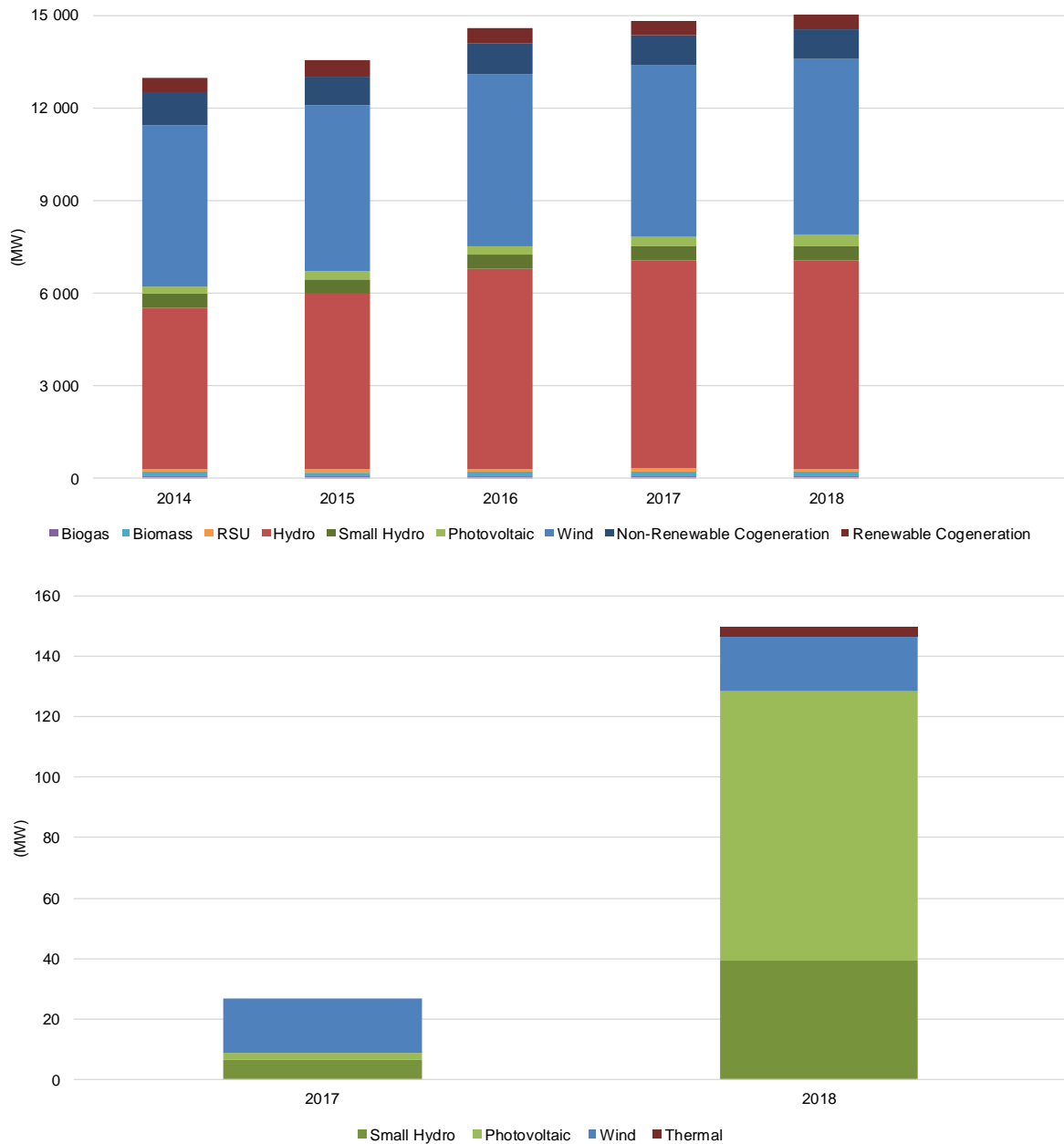
In 2018, SRG installed capacity represented 76% of the total installed capacity of the Portuguese electricity system. From 2014 to 2018, this weight varied between 73% and 76%. Figure 3-4 shows the SRG installed capacity between 2014 and 2018, as well as the market-based SRG installed capacity in 2017 and 2018,

²⁰ Order n.º 8810/2015 of 10 August, of DGEG, 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.

²¹ Since the end of 2011, the SLR specifies SRG with guaranteed remuneration selling offers in MIBEL, working as a bonding agent for these generators in Portugal and therefore responsible for deviations.

excluding large hydro to facilitate reading. In 2018 there was an installed capacity of about 150 MW with those divided by 26% small hydro, 59 % solar, 12 % wind and 2 % thermal.

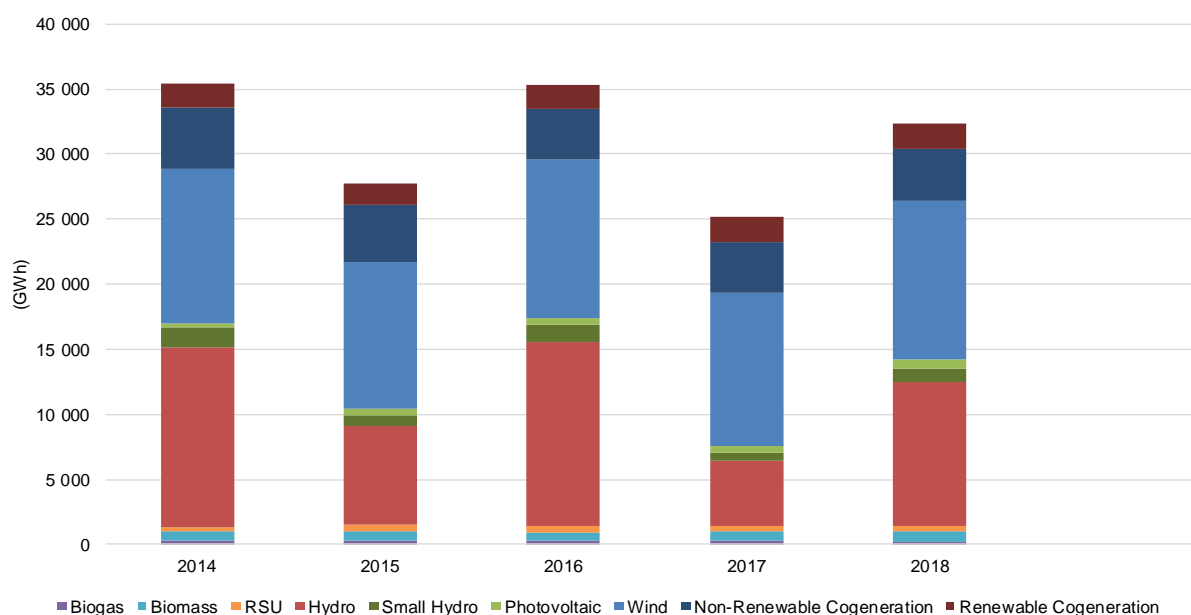
Figure 3-4 - SRG installed capacity, 2014 to 2018



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

Regarding the energy produced in 2018, approximately 32 TWh came from SRG, representing 59% of the total produced energy, a figure that between 2014 and 2018 was ranged between 46% and 72%. Figure 3-5 shows SRG energy production between 2014 and 2018, broken down by technology.

Figure 3-5 – SRG energy production, 2014 to 2018



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

The analysis of the previous figures highlights the importance of SRG, particularly renewable energy sources, for the Portuguese electricity system.

RECENT REGULATIONS DEVELOPMENTS

PILOT-PROJECT ON PARTICIPATION OF CONSUMPTION IN REGULATION RESERVE MARKET

In December 2018 ERSE approved the new rules on the participation of consumption in the regulation reserve market, as a result of the 67th public consultation held by ERSE where this topic was discussed among stakeholders.

According to the new rules, participation in the reserve regulation market is open to all consumers recognised by the TSO. They must be capable of offering at least 1 MW bids, following technical and operational certification by TSO, and be connected to at a voltage level equal or greater than MV. For the purpose of this pilot project, rules foresee a limited 1 year duration, starting on 2 April 2019.

This pilot project is the first step towards full participation of consumption in ancillary services markets. Its ultimate goal is to ensure equal treatment for consumers (or their representatives) and producers who currently bid on these markets.

3.1.2 NETWORK TARIFFS FOR CONNECTION AND ACCESS

REGULATORY FRAMEWORK

ERSE is responsible for the approval of the methodology used for calculating tariffs and prices for the electricity sector, the methods for regulating allowed revenues, as well as for the approval of the access tariffs to the transmission and distribution networks and of the transitional tariffs (applied to the last resort suppliers)²².

The methodology used for calculating tariffs and the methods for regulating allowed revenues are set in the Tariffs Code (RT), which is elaborated and approved by ERSE, after a public consultation process and the mandatory non-binding opinions by ERSE's advisory bodies, namely the Advisory Board and the Tariff Board. The tariff fixing process, including its time frame, is also defined in the RT.

The tariffs set for 2018, including the access tariffs to the electricity networks, incorporate the rules approved following the 2017 regulatory review²³.

At the end of 2018, a public consultation²⁴ took place for the introduction of a change of the RT regarding the activity of buying and selling energy by the SLR, the "energy supply mechanism by the SLR", the results of which will take effect in 2019.

PROCEDURES AND METHODOLOGY FOR CALCULATING ELECTRICITY NETWORK ACCESS TARIFFS

Network access tariffs are charged to all electricity consumers for the use of the public service electricity network infrastructure. Generally speaking²⁵, these tariffs are paid by suppliers on behalf of their customers.

²² Established in the ERSE Statutes, approved by the Decree-Law n.º 97/2002, with the redaction of the [Decree-Law n.º 57-A/2018, of 13 July](#).

²³ [Regulation n.º 619/2017, of 18 December](#) of ERSE, which approves the Tariffs Code of the electricity sector (in Portuguese).

²⁴ [Public Consultation n.º 68](#), proposal to change the Tariffs Code of the Electricity Sector – efficient supply mechanisms by the SLR and fitness of the energy tariff.

²⁵ 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.

The revenues generated from regulated activities are recovered through specific tariffs, each with its own tariff structure and a given set of billing variables. These tariffs are the following: Global Use of the System, Use of the Transmission Network in Extra High Voltage (EHV) and HV, Use of the Distribution Networks in HV, MV and LV (low voltage) and the Switching Logistics Operator²⁶. 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 the activity are recovered. The tariff design, including billing variables, is based on the principle of non-discrimination of the energy's end-use, with all tariffs 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, cross-subsidisation between consumers is avoided and an efficient use of resources is promoted.

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

Table 3-4 presents the existing access tariffs and their billing variables.

²⁶ Since 2018, following the publication of [Decree-law n.º 38/2017, of 31 March](#), which establishes the switching operator. Previously, the switching logistics operation was done by the medium and high voltage distribution network operator.

Table 3-4 – Electricity access tariffs and billing variables

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	●	●	●	●	●

Notes: SpLV – Special Low Voltage; StLV – Standard Low Voltage.

NETWORK ACCESS TARIFFS PRICES

The network access tariffs for 2018²⁷, considering the demand forecasted for 2018, correspond to a tariff decrease of 4.4% between 2017 and 2018 (see the following table, where variations per voltage level are also presented).

Table 3-5 – 2018 Access Tariffs

	2017 Tariffs (average prices) €/kWh*	2018 Tariffs (average prices) €/kWh	Change
Network Access Tariffs	0.08307	0.07943	-4.4%
Access to EHV Networks	0.02627	0.02513	-4.4%
Access to HV Networks	0.03298	0.03154	-4.4%
Access to MV Networks	0.05572	0.05329	-4.4%
Access to SpLV Networks	0.09527	0.09108	-4.4%
Access to StLV Networks	0.12792	0.12232	-4.4%

* Application of 2017 tariffs to the demand forecasted for 2018.

Source: ERSE Data

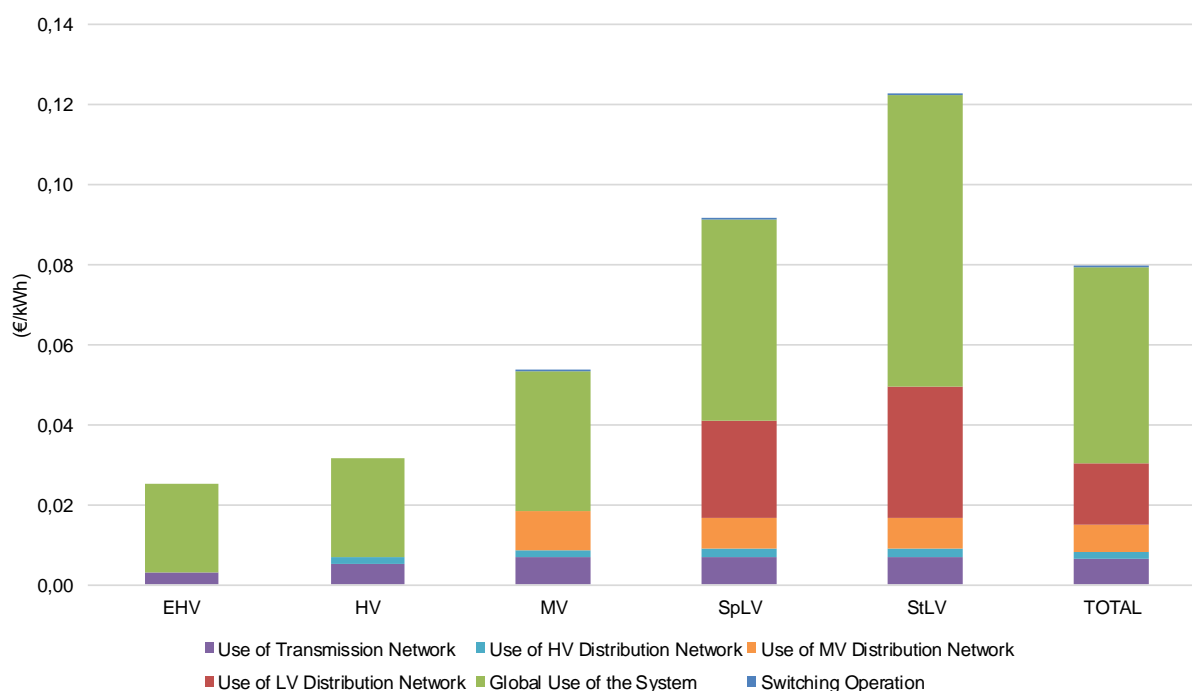
²⁷ [Directive n.º 2/2018](#), of 4 January, which approves the tariffs and prices for the electric energy and other services in 2018 (in Portuguese).

The tariffs variation in 2018 resulted from a combination of factors, including:

- a) A significant debt amortisation as the main factor that contributed to the tariffs decrease, justified by the need to reinforce the system balance, ensuring its sustainability.
- b) Increase of the fossil fuel costs, namely coal and natural gas, which contributed to an increase in the energy production costs, reflected in the increase of the energy tariff.
- c) Conversely, the transfer to electricity consumers of part of the efficiency gains obtained by the companies in the previous regulatory period, through a downward revision of the level of costs to be recovered through tariffs.
- d) Downward revision of the remuneration rates applied to the regulated companies' investments during the regulatory period 2018-2020.
- e) The negative evolution of the costs of the SRG with bonus rate, which also contributed to the tariff reduction.
- f) Application of mitigating measures established by legal diplomas of previous years, which reduce the level of the General Economic Interest Costs (CIEGs) to be recovered through tariffs.

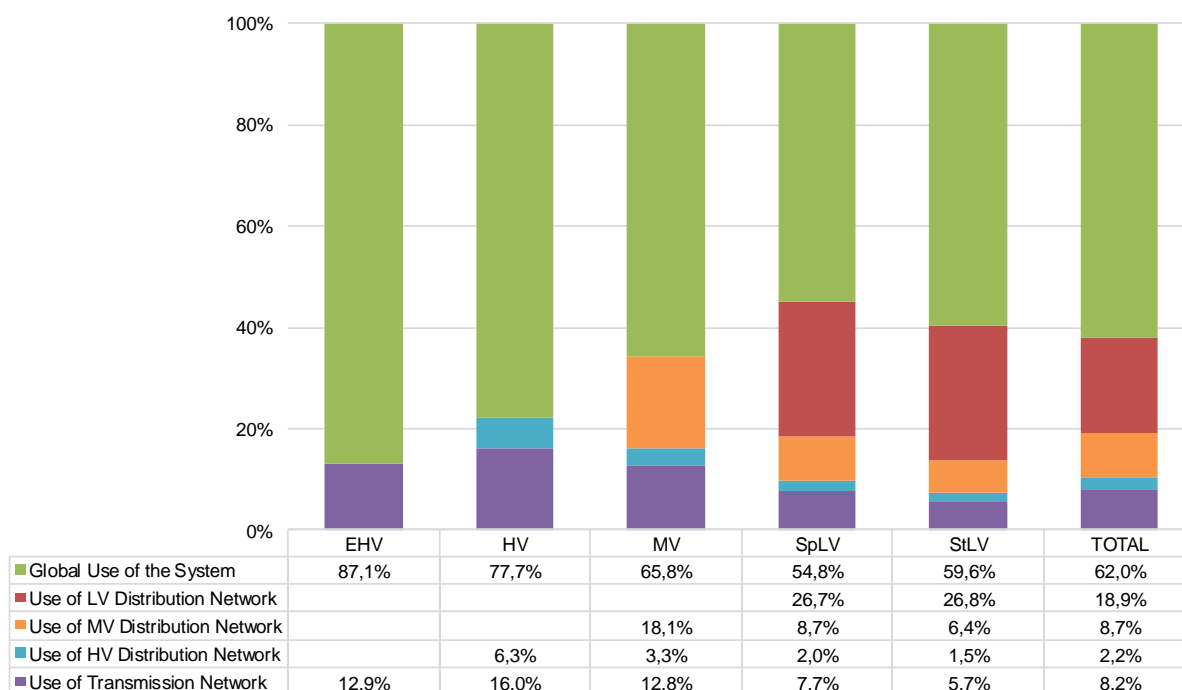
Figure 3-6 below shows the breakdown of average prices for the 2018 network access tariffs per regulated activity and voltage level, while Figure 3-7 shows the corresponding structure of average prices per regulated activity and voltage level.

Figure 3-6 – Breakdown per activity of the average price of network access tariffs in 2018



Source: ERSE Data

Figure 3-7 – Structure of the average price of network access tariffs by regulated activity per voltage level in 2018



Source: ERSE Data

RECENT REGULATORY DEVELOPMENTS

SMART GRIDS SERVICES FOR ELECTRICITY DISTRIBUTION NETWORKS

During 2018, ERSE has prepared a regulation over the services to be provided to customers by DSOs that hold smart grids, namely about consumption data availability and the provision of grid services carried out remotely. The regulation was submitted to public consultation in January 2019.

PILOT PROJECTS FOR THE ADAPTATION OF THE STRUCTURE OF NETWORK ACCESS TARIFFS

In February 2018²⁸, ERSE approved the rules for pilot projects on tariff structure improvement and on dynamic tariffs network access on the EHV, HV and MV lines in mainland Portugal. The approved rules were previously discussed in a public consultation process²⁹ with all interested parties.

Two pilot projects were approved, namely, Pilot Project 1, called “Improvement of the Network Access Tariffs in mainland Portugal” and Pilot Project 2, called “Introduction of a Dynamic Tariff for Network Access in mainland Portugal”, implemented since July 2018, with a duration of 12 months.

Pilot Project 1 intends to evaluate the benefits associated with the improvement of network access tariffs, testing issues such as price differentiation within the peak period and the definition of new tariff periods more suited to transferring network costs. Pilot Project 2 intends to test the introduction of a new dynamic network access tariff. This tariff might be an important tool to guide the use of electricity networks, in a context where increasingly renewable production is being installed in a dispersed form at the distribution network, which may influence significantly the energy flows at the several voltage levels, decreasing the ability to forecast the flows in longer time frames.

REGULATION METHODOLOGIES FOR DETERMINING ALLOWED REVENUE

2018 was the first year of the 2018-2020 regulatory period. At the beginning of a new regulatory period, it is important to know the regulatory methodologies applied and the differences compared to the previous period.

²⁸ Approved by [Directive n.º 6/2018](#), of 27 February.

²⁹ In the [59th ERSE public consultation](#).

Below follows a summary of the regulatory models in force for the new regulatory period by type of network operator and for suppliers of last resort:

- For Mainland Portugal:
 - Transmission system operator (TSO) – for transmission activity: model based on economic incentives: (i) application of a price cap³⁰ methodology with efficiency targets for operating costs (OPEX³¹); (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 differentiated rate of return; (iii) incentive to increase availability of the elements of the RNT; (iv) 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 targets³².
 - Distribution network operator (DSO): Price cap methodology applied to unit operating costs (OPEX) and accepted costs³³ on an annual basis in the case of investment costs, 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 TOTEX³⁴ in the distribution of electricity at LV. Other incentives also apply: (i) incentive for investment in smart networks³⁵; (ii) incentive to improve service continuity and (iii) incentive to reduce losses;

³⁰ 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%.

³¹ Operational expenditure.

³² The annual efficiency factor is 1.5%

³³ Cost drivers in HV/MV are distributed energy and network length (km); in LV, cost drivers are distributed energy and number of customers. The annual efficiency factor is 2.5%, plus inflation.

³⁴ Total expenditure.

³⁵ 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.

- Switching operator: Starting in 2018, the supplier switching activity was separated³⁶ and subjected to a revenue cap methodology for OPEX³⁷ and accepted costs for CAPEX³⁸.
- Suppliers of Last Resort: Price cap methodology³⁹ supplemented by a component for non-controllable costs in order to include costs of extraordinary nature that arise from changes in the activity level and in the profile of the portfolio of customers underlying the regulated tariffs extinction process. This cost component must be analysed and calculated on an annual basis, casuistically, and should only be considered when justifiable.
- In the Autonomous Regions of the Azores and Madeira, companies with electricity transmission and distribution concessions are subject to regulation based on economic incentives: (i) regulation of electricity purchase and management activities via a revenue cap methodology⁴⁰; (ii) regulation of the electricity distribution activity via a price cap methodology⁴¹ for calculating allowed revenues; (iii) definition of reference costs for fuels (fuel oil, gas oil and natural gas) consumed in the generation of electricity, as well as for costs arising from the unloading and storage of those fuels⁴².

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 costs⁴³, the control mechanism for return on assets was maintained, with the aim of ensuring an approximation between the real return rate of these assets resulting from the methodology set for this regulation period and thus avoiding excessive gains that may arise from effects unrelated to the performance of the companies.

³⁶ Until 2018, the supplier switching activity was performed by the HV/MV distribution system operator.

³⁷ Efficiency factor set at 1.5%.

³⁸ Capital expenditure.

³⁹ Cost driver is the number of customers. The efficiency factor is 1.5%

⁴⁰ Efficiency factor set at 1.5%.

⁴¹ 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.

⁴² 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.

⁴³ Return rates on assets for 2018 in mainland and autonomous regions – transmission: 5.17%; distribution: 5.42%.

The allowed revenue 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 includes costs arising essentially from legal decisions, the so-called General Economic Interest Costs (CIEGs).

The most significant CIEGs, either in terms of value or their impact on the functioning of the market, are related to generation. Market liberalisation has led to the need to anticipate the termination of long-term power purchase agreements (CAEs). Two of these contracts remained in force, and the energy generated by those two plants is now managed by a trading company.

The revenue of this trading company depends on incentives defined by ERSE. In general, these incentives result in a direct relationship between the revenues of the supply undertaking and the operating margin obtained through the sale of energy from the two plants with CAEs on the market.

The remaining power purchase agreements were terminated 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.

In line with the applicable legislation, this regime ended in 2017, at which point ERSE calculated the final adjustment, based on a study sent to the member of the Government responsible for energy, at the end of September 2017, as provided for in Article 170.^o of Law n.^o 42/2016, of 28 December, which approved the State budget for 2017. The effect on tariffs of the amounts concerned only occurred in 2018.

In addition to those costs, there are other equally significant costs related to the remuneration of the energy generated by renewable resources or cogeneration (SRG, except for large hydropower plants), determined administratively; to the concession of rents paid by the distribution network operator to municipalities; and to 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 2018, no significant changes were registered regarding the nature of the portions included in CIEG.

NETWORK CONNECTION COSTS

The connection of a facility to the electricity network generates costs that depend on the type of facility to be connected (voltage level, technical requirements), the network itself (aerial, underground, meshed, radial), the distance, route, etc.

The electricity RRC sets the regulatory framework that applies to network connections, including charges, as described in section 3.1.1.3. One of the main issues of this framework is the cost setting that petitioners have to meet, bearing in mind that the difference between total investment costs and costs met by petitioners is paid by consumers through use of the network tariffs.

3.1.3 CROSS-BORDER ISSUES

In 2018, 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* mechanism⁴⁴.

It should be noted that MIBEL began operating officially on 1 July 2007, based on a single daily market which 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; Access to Networks and Interconnections Code⁴⁵; Manual of Procedures for the Joint Management Mechanism of the Portugal–Spain Interconnection⁴⁶; Joint Rules for Contracting Capacity in the Portugal–Spain Interconnection; and

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

⁴⁵ 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.

⁴⁶ The Manual of Procedures for the Joint Management Mechanism of the Portugal–Spain Interconnection was approved by ERSE Regulation no 474/2013, published in *Diário da República*, 2.ª série, of 20 December.

Manual of Procedures for Global Technical Management System in the electricity sector⁴⁷.

In 2018, 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), and
- 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 (SWE) that includes the interconnections of Portugal, Spain and France.

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

REVENUE FROM CONGESTION ON INTERCONNECTIONS

According to European legislation and regulation, congestion revenue may only be used to: 1) offset costs arising from coordinated balancing actions⁴⁸ with a view to ensuring the interconnection capacity contracted in the daily and intraday market; 2) make investments to strengthen the interconnection capacity; or 3) reduce the use of the transmission network tariff, if the revenue is not used for the two aforementioned purposes.

In 2018, the revenue from congestion on interconnections between Portugal and Spain, arising from the difference between zonal prices after the application of market splitting, reached a total of 4.55 million euros (Table 3-6), close to the amount registered in 2017 (4.87 million euros). This decrease is explained by a reduction in the number of hours where market splitting occurred and the reduction of the arithmetical price differential.

The following table 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

⁴⁷ The Manual de Procedures for the Global Technical System Management for the electrical sector was approved by ERSE Directive no 9/2014, published in Diário da República, 2.ª série, of 15 April.

⁴⁸ Coordinated balancing actions apply when interconnections face real time congestion, and consist of an opposite physical energy transaction traded between system operators, of the same amount but opposite flow direction of the congestion, in order to clear scheduled commercial transactions.

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, 2018

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	105	14%	51.63	49.98	1.66	354 087	345 384	2 112
February	38	6%	54.98	54.88	0.10	338 629	334 194	128
March	83	11%	39.75	40.18	-0.43	116 130	886 876	1 154
April	70	10%	42.66	42.67	-0.01	236 973	396 346	540
May	24	3%	55.08	54.92	0.17	346 854	238 997	223
June	11	2%	58.48	58.46	0.02	139 787	578 259	54
July	25	3%	61.84	61.88	-0.04	48 888	676 497	56
August	16	2%	64.29	64.33	-0.04	115 285	541 488	70
September	6	1%	71.30	71.27	0.02	197 643	335 854	32
October	33	4%	65.38	65.08	0.30	425 312	256 859	386
November	16	2%	62.01	61.97	0.04	210 410	501 059	57
December	29	4%	61.87	61.81	0.06	341 247	474 142	143
								4 955

Source: OMIE⁴⁹ data

The very slight reduction in global congestion rents compared to 2017, results from a similar absolute level of price differential (spread) during the hours of congestion (minor decrease). However, it is worth noting that in the 1st quarter of 2018 some significant variations of congestion rents occurred following peaks on hourly price differential (in January both high levels of price differential occurred as did a high number of market splitting hours). This patterns had already been observed in the 4th quarter 2017.

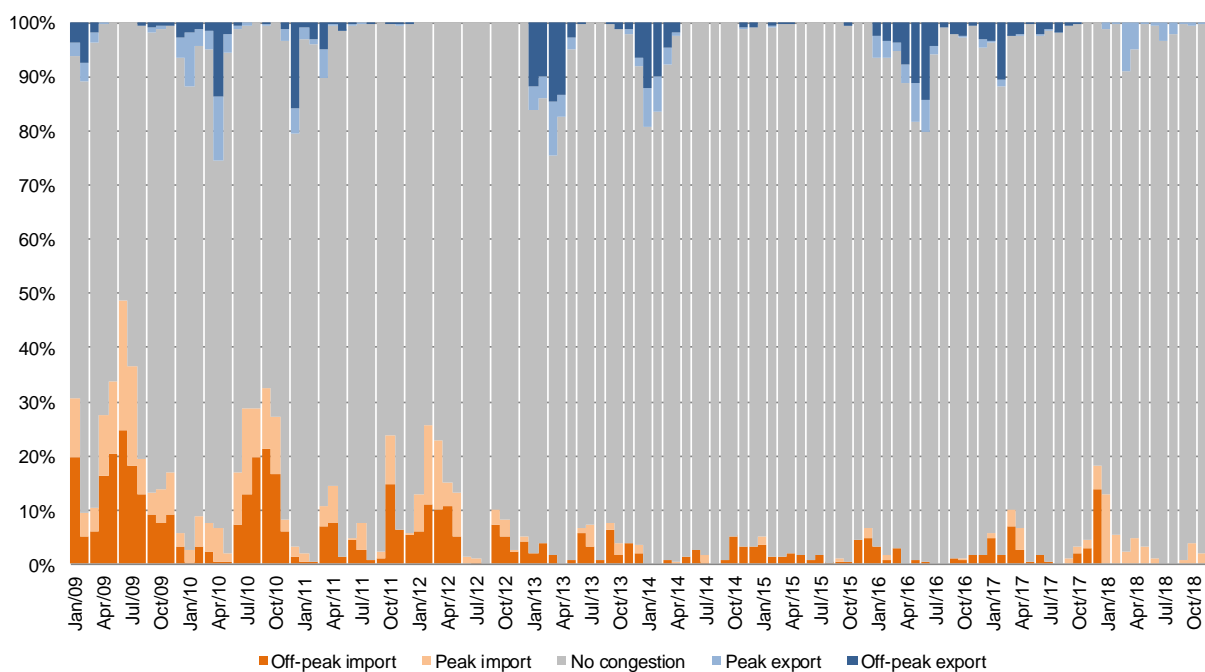
2018 ended with a decrease of 20% in the total hours of congestion, from 586 hours in 2016 to 456 hours in 2018. This total includes congestion in both directions of the interconnection and reflects a greater integration of the markets.

⁴⁹ Operador del Mercado Ibérico de Energía – Spanish hub

In terms of the price differential, in 2018 there was a positive average *spread* of 0.15/MWh, in imports, slightly lower than the figures for 2017 (import spread of 0.23/MWh). This pattern is explained by an increase in first 3 quarters of 2018 with the last quarter of 2018 showing a sharp decrease resulting in the lower figures for 2018.

The figure below shows the use of the available capacity in both directions of the Portugal-Spain interconnection, and shows the decrease in overall the number of hours of congestion in both directions in 2018, but with a higher number of congested hours in the 1st quarter of 2018.

Figure 3-8 – Usage of the Portugal-Spain interconnection capacity, 2008 to 2018



Source: REN and OMIE data

COOPERATION

ERSE regularly cooperates 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 Board of MIBEL 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 Europe⁵⁰ (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 2018. 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 Council of Regulators of the MIBEL and of the South West Europe region.

Throughout 2018, quarterly auctions were held for each direction of the interconnection, concerning the last 3 quarters of 2018. The auctions took place through a platform managed by OMIP⁵¹, and all the transmission rights that were offered were acquired.

Table 3-7 shows financial transmission rights (FTR) auctions of commercial capacity in the Portugal-Spain interconnection with 2018 delivery.

⁵⁰ ACER Decision n.º 6/2016 of 17 November, on the definition of Capacity Calculation Regions, provided for in Commission Regulation (EU) 24/1222 of 24 July 2015, establishing a guideline on capacity allocation and congestion management. The Capacity Calculation Region of SWE comprises the Portuguese, Spanish and French interconnections.

⁵¹ Iberian Market Operator Portuguese hub.

Table 3-7 – IPE Auctions with 2018 delivery

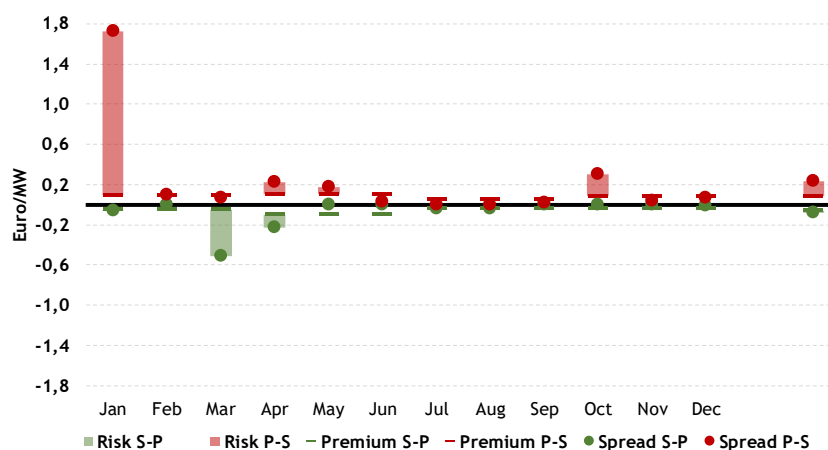
Contract	IPE Auction	Date	Premium (€/MWh)	Volume (MW)	Participants	Participants with allocated capacity
Q1 E-P	IPE 17	13/12/17	0.05	500	7	6
Q1 P-E	IPE 17	13/12/17	0.10	500	8	8
Q2 E-P	IPE 17	13/12/17	0.06	200	7	6
Q2 E-P	IPE 18	15/03/18	0.12	300	9	6
Q2 P-E	IPE 17	13/12/17	0.10	200	8	7
Q2 P-E	IPE 18	16/03/18	0.11	300	10	6
Q3 E-P	IPE 18	17/03/18	0.05	200	9	6
Q3 E-P	IPE 19	19/06/18	0.03	300	9	8
Q3 P-E	IPE 18	18/03/18	0.07	200	10	5
Q3 P-E	IPE 19	19/06/18	0.06	300	10	7
Q4 E-P	IPE 19	19/06/18	0.04	200	9	7
Q4 E-P	IPE 20	18/09/18	0.04	300	9	8
Q4 P-E	IPE 19	19/06/18	0.12	200	10	7
Q4 P-E	IPE 20	18/09/18	0.07	300	10	7

Table 3-8 presents the settlement of annual FTR auctions with 2018 delivery in the Portugal-Spain interconnection. Figure 3-9 shows spreads and premiums in 2018.

Table 3-8 – Annual FTR settlement with 2018 delivery

Annual FTR settlement	GLOBAL	ES > PT	PT > ES
Capacity (MW)	500 + 500	FTR E-P 500	FTR P-E 500
Energy (MWh)	4 380 000 + 4 380 000	4 380 000	4 380 000
Premium (€/MWh)	----	0.06	0.09
Spread (€/MWh)	----	0.08	0.23
Spot congestion (euros)	4 954 782	1 732 975	3 221 807
FTR risk (euros)	1 342 055	328 775	1 013 280
FTR actions premium (euros)	638 702	244 939	393 763
Net FTR auctions (euros)	-703 353	-83 836	-619 517
Spot congestion + Net FTR (euros)	4 251 429	1 649 139	2 602 290
FTR - Financial Transmission Rights			

Figure 3-9 - Spreads and premiums in 2018



It can be seen that in the direction Portugal to Spain, in 2018, there was a 0.08 €/MWh spread and a 0.06 €/MWh premium. In the direction Spain to Portugal, in 2018, there was a 0.23 €/MWh spread and a 0.09 €/MWh premium. As a result, the FTR capacity auctions on the Portugal-Spain interconnection with 2018 delivery yielded approximately 700 000 euros in costs for the system.

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.

The interconnections auctions held at OMIP took place on 15 March, 19 June and 18 September 2018, for FTR contracts with 2018 delivery and settlement and clearing at OMIClear.

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 whose 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 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.

Following the publication of these harmonised capacity allocation and splitting rules in the Portuguese–Spanish interconnection, ERSE amended the Portugal–Spain Interconnection Joint Procedures Manual through ERSE Directive 1/2019, of 7 January.

The financial capacity auctions with 2019 delivery, which took place in 2018 December at the single allocation platform (SAP), were the following.

Table 3-9 – Auctions at SAP during 2018

Contract	Maturity	Date	Premium (€/MWh)	Volume (MW)	Participants	Participants with allocated capacity
ES-PT YR	Anual	11/12/18	0.12	250	16	8
PT-ES YR	Anual	11/12/18	0.08	350	16	9
ES-PT Q1	Trimestral	17/12/18	0.11	170	9	6
PT-ES Q1	Trimestral	17/12/18	0.08	310	9	7
ES-PT M1	Mensal	21/12/18	0.17	220	17	5
PT-ES M1	Mensal	21/12/18	0.06	560	16	12

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

In 2018, normal functioning continued of the Replacement Reserve (RR) exchange mechanism between TSOs, which was approved in 2014 under the Regional South West initiatives of ACER, MIBEL and the BALIT mechanism (Balancing Inter TSO), for the exchange of RR between operators.

Table 3-10 shows, for Portugal, the accumulated energy values of 2018 RR traded within BALIT and their weight in total RR⁵². The table also shows the number of hours in which RR was activated in each direction and the respective average (arithmetical) prices verified.

⁵² For example, 15% corresponds to the weight of the imported energy activated by REN with Red Eléctrica of Spain in terms of the total value of RR in 2018 in Portugal.

Table 3-10 – Statistics on BALIT, 2018

	PT-ES Import	PT-ES Export
Energy (GWh)	99	26
N° activated hours	627	180
Weight of BALIT in RR (%)	15%	2%
Average Price (€/MWh)	63	53

Source: REN data

With the publication on 28 November 2017 of Commission Regulation (EU) 2017/2195 establishing a guideline on electricity balancing (Guideline on Electricity Balancing, EB GL), common European platforms were established for the imbalance netting process (IN) and for the exchange of balancing energy from frequency containment reserves (FCR), frequency restoration reserves (with automatic activation (aFRR) and manual activation (mFRR)) and RR, which aim to integrate the balancing energy markets.

The European projects in which ERSE is participating and that are associated with these platforms are IGCC for IN, PICASSO for aFRR, MARI for mFRR and TERRE for RR⁵³. Participation in these platforms is mandatory except for TERRE which is exclusive to Member States whose TSOs use the Replacement Reserve, formerly known as the Regulation Reserve.

The TERRE (RR) and IGCC (IN) project platforms are scheduled for January 2020, while the PICASSO (aFRR) and MARI (mFRR) project platforms are expected to be operational by early 2022.

The TERRE project, which started in 2013, is a voluntary pilot project resulting from the early implementation initiatives of the European Balancing Network Code (EB GL, Regulation (EU) 2017/2195), which provides the basis for the project. This project continued to have relevant developments in 2018, mainly regarding the hiring of suppliers for the IT implementation platform. In addition to REN, the TSO members of this pilot project are REE (Spain), RTE (France), National Grid (Great Britain), Swissgrid (Switzerland), TERNA (Italy), PSE (Poland), CEPS (Czech Republic) and Transelectrica (Romania). There are also observer TSOs: ADMIE (Greece), MAVIR (Hungary), ESO (Bulgaria) and Statnet (Norway).

⁵³ 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

As established in EB GL, in 2018 the TSOs submitted to regulators implementation framework proposals for the establishment of the several platforms. The presentation of these proposals was preceded by joint work between the TSOs and the regulators who provided, as guidance to the TSOs, shadow opinions for the implementation framework proposals for the various platforms. As regards RR and IN, the implementation framework proposals were submitted by the TSOs in June 2018. In December 2018, the RR implementation framework proposal was approved by the regulators, while the IN implementation framework proposal received a request for amendment by regulators. As regards mFRR and aFRR, the implementation framework proposals for their respective platforms were submitted by REN and most TSOs in December 2018.

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 the 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 that the entity designated as NEMO is OMIE⁵⁴, responsible for the management of the day-ahead and intraday markets. This decision was reported to ACER in December 2015.

In 2018, 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 CACM GL. As a result of this initiative, the first go-live phase of the XBID project was launched on 13 June 2018, which opened intraday continuous electricity trading in the following countries: Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Latvia,

⁵⁴ Operador del Mercado Ibérico de Energía – Polo Español, S.A.

Lithuania, Norway, the Netherlands, Portugal, Spain and Sweden. The remaining European countries are expected to participate in the second phase of XBID's go-live, which will take place in the summer of 2019.

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 capacity available for the trade. The solution aims to increase the overall efficiency of continuous intraday trading.

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).

MONITORING OF INVESTMENTS MADE BY THE ELECTRICITY NETWORK OPERATORS

Development and investment plan for the electricity transmission network

REN Eléctrica, SA, in its role as transmission network operator, submitted a proposal for the Development and Investment Plan for the Transmission Network concerning the 2018-2027 period (PDIRT-E 2017 proposal) to the DGEG. In turn, DGEG sent the proposal to ERSE. The regulator is responsible for organising a public consultation on its content, pursuant to the terms of Article 36-A (5) of Decree-Law n.º 172/2006 of 23 August amended by Decree-Law n.º 215/2012 of 8 October. Thus, within the scope of the competences that are legally attributed to it, ERSE submitted for public consultation the PDIRT-E 2017 proposal, as prepared by the TSO, from 15 February to 29 March 2018.

Taking into account the result of that consultation, as well as the comments obtained following the consultation of the Advisory Board and the Tariff Board, ERSE analysed the PDIRT-E 2017 proposal and issued a favourable opinion on it. ERSE also gave a positive opinion on the main transmission projects which were included in the last editions Ten Year Network Development Plan, TYNDP 2016 and 2018, highlighting the importance of a new interconnection Portugal – Spain, classified as a PCI project, due to the importance of this project with regard to market integration and security of supply.

Development and investment plan for the electricity distribution network

In 2018, EDP Distribuição, S.A., in its role as distribution network operator, submitted to DGEG its proposal for the Development and Investment Plan for the Electricity Distribution Networks concerning the 2019-2023 period (PDIRD-E 2018). In turn, DGEG sent the proposal to ERSE, The regulator is responsible for organising a public consultation on its content, pursuant to the terms of Article 40-A of Decree-Law n.º 172/2006 of 23 August amended by Decree-Law n.º 215/2012 of 8 October.

Thus, within the scope of its legal competences, ERSE conducted a public consultation on the PDIRD-E 2018 proposal, as prepared by the DSO, from 1 March until 15 April 2019.

Taking into account the result of that consultation, as well as the comments obtained following the consultation of the Advisory Board and the Tariff Board, ERSE analysed the PDIRD-E 2018 proposal and issued a favourable opinion on 5 June 2019, drawing attention to a series of comments that should be taken into account in the preparation of future PDIRD proposals. Among the comments included in ERSE's Opinion, we highlight the need to further invest in quality of service (ERSE asked for the adoption of the proposed higher investment scenario on this topic for the period 2019-2021, with an increase of 16.1 M€ compared to the central scenario proposed by DSO). However, in order to ensure that no tariff increase would result from this higher investment, ERSE recommended that the DSO postpone some other projects which are not urgent and which do not affect quality of service, reducing the plan during its last two years, for a total amount of 23 M€.

3.1.4 LOW VOLTAGE DISTRIBUTION CONCESSIONS

The distribution activity in Mainland Portugal is developed according to a public service concession regime at two levels: i) a single concession of the national distribution network at medium voltage (MV) and high voltage (HV) assigned by the State; and ii) the municipal low voltage (LV) concessions granted by the country's 278 municipalities. The LV concessions have a term of 20 years ending at different times between 2016 and 2026. The majority will cease between 2021 and 2022. Its attribution must result from a public tender.

The Portuguese Parliament has determined that the launch of BT distribution concessions tenders must be synchronised, even though the current concessions cease at different times. A law approved the general principles for the organisation of public tenders, established that each competition has a territorial area set in accordance with the law itself (preventing the appearance of 278 new network operators) and

determined that the tenders should be launched in 2019. The regulator draws up a demarcation proposal based on technical and economic studies. The municipalities must define the areas in competition. The standard tender documents are approved by the Government.

The Parliament and the Government have charged the regulator with drawing up technical proposals, both as regards the demarcation of tenders and the aspects to be included in the standard tender documents. During 2018, ERSE prepared the proposals for the concession assignment procedures and the proposal for the territorial areas demarcation for the contests for the attribution of concessions of electricity distribution at low voltage. These were published on 21 January 2019. These proposals were subject to a public consultation and discussion with those involved (the municipalities themselves, but also the network operators and those potential interested in the activity). The Government must also approve the standard documents of the tender so that its launch can begin.

3.2 PROMOTING COMPETITION

3.2.1 WHOLESALE MARKET

In 2018, an increase was observed in the level of concentration in the electricity market, due to favourable hydrological conditions for hydropower generation by the dominant operator, EDP. This situation contributed to a decrease in the level of participation of thermal power plants, compared to 2017, with a resulting decrease in the energy generated by both coal-fired power stations and combined-cycle natural gas power stations. Compared to 2017, in 2018 there were cyclical factors that led to an increase in the price differential between the MIBEL areas, namely the increased hydrological conditions.

From a regulatory point of view, the development of market supervision mechanisms by ERSE sought to help strengthen the transparency and integrity of the wholesale electricity market. Therefore, from a general point of view, due to favourable hydrological conditions, 2018 was marked by an evolution that was beneficial to the incumbent⁵⁵, owner of all the installed hydro capacity in Portugal, leading to an increase in the global concentration of electricity generation. Consequently, a high level of concentration

⁵⁵ 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.

persists in the electricity market, so the implementation of further measures to foster competition and promote transparency should follow on from the developments already achieved.

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

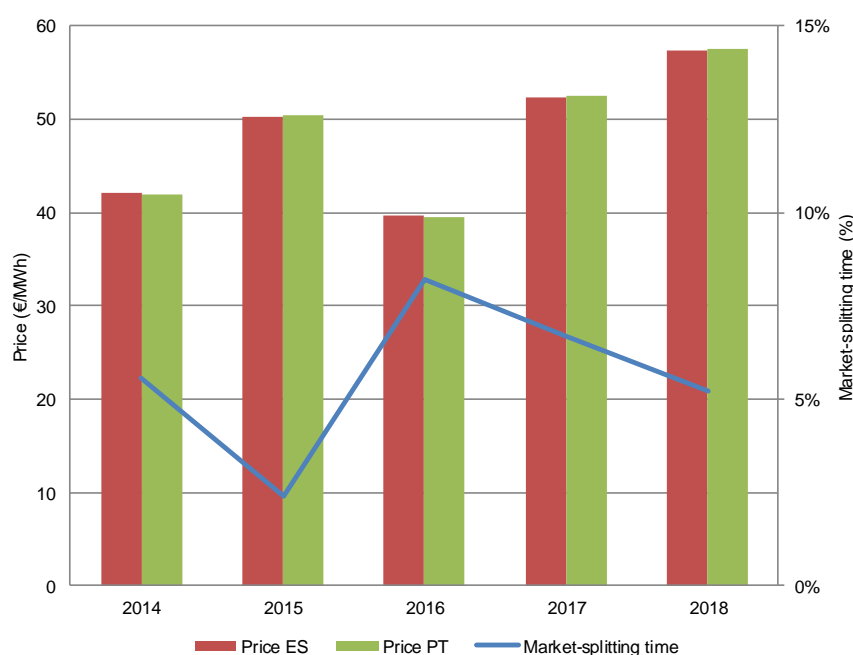
PRICES

Spot market prices

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

The price formed on the spot market is common to Portugal and Spain, except in situations in which there is congestion on the interconnection, resulting in the need to apply the market-splitting mechanism, and thus, to apply different prices in the two countries. The evolution of the annual average price in the spot market, in Portugal and Spain, as well as the percentage of market splitting time are presented in Figure 3-10.

Figure 3-10 – Spot market average annual price evolution and market splitting, 2014 to 2018



Source: OMIE data

As can be seen from this figure, in 2018, the average price on the spot market for Portugal was 57.45 €/MWh, nearly 9% above the price recorded in 2017 (52.28 €/MWh). Despite the improvement in hydrological conditions and the resulting increase in hydropower generation, these price variations were also influenced by an increase in carbon emission prices. In 2018, the average market price in Portugal was approximately 4% below the marginal⁵⁶ reference cost for combined-cycle natural gas power plants, excluding the cost component associated with the access to the high-pressure natural gas network, and approximately 44% above the marginal cost for coal-fired thermal plants. Regarding the setting of the spot market price, the market's volatility represents an important aspect considered by market agents, namely regarding the need to cover price risks. In 2018, 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 21%, which means prices ranged, on average, between €45/MWh and €70/MWh.

Figure 3-11 shows the evolution of the annual volatility of the spot market price, from 2014 to 2018, for Portugal and Spain, with a slight decrease in the spot price volatility between 2017 and 2018.

⁵⁶ Estimated marginal cost calculated according to the methodology adopted by Directive n.º 3/2017 issued by ERSE (http://www.erse.pt/pt/legislacao/Legislacao/Attachments/1982/Diretiva%203_2017.pdf), which excludes the estimate for third-party access to the high-pressure natural gas network.

The marginal cost of the combined-cycle natural gas thermoelectric power stations is published at: <http://www.mercado.ren.pt/PT/Electr/InfoMercado/InfOp/BandaSecundaria/Paginas/AjustePrc.aspx>.

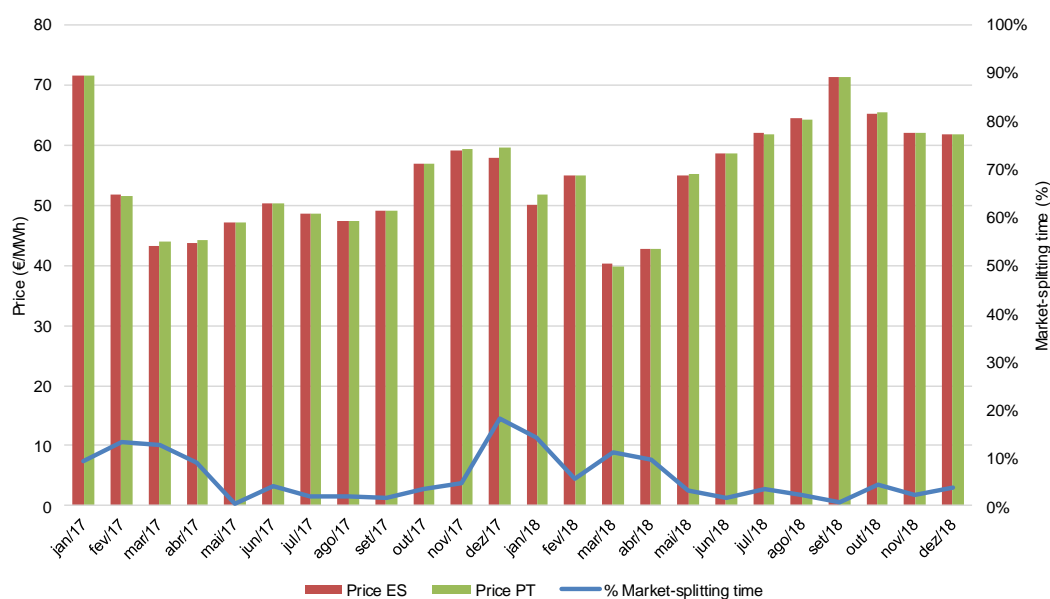
Figure 3-11 - Volatility of spot price, 2014 to 2018



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 price evolution in Portugal and Spain and the percentage of market splitting time, on a monthly basis, for 2017 and 2018. Regarding 2018, the following should be highlighted: (i) an increase in the 2018 average market price compared to 2017; (ii) a more favourable hydrological regime throughout the year; (iii) a decrease in market splitting compared to 2017.

Figure 3-12 - Spot market price and market splitting, 2017 and 2018



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 the price volatility and to ensure the availability of electricity (supply) or to meet demand with characteristics of greater predictability and stability.

The spot market is a rather liquid platform in the Iberian context. Specifically in the Portuguese case, approximately 73% of consumption is met through contracts made in this market referential⁵⁷. In this context, without an intrinsic market problem of liquidity or depth within the definition of the classically used 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.

⁵⁷ Includes daily market and intraday auctions. During the months from June to September 2018, the volume trade on the continuous intraday market represented close to 1.3% of the volume trade on the daily market (close to 360 GWh).

The evolution of the price set in the forward market raised expectations of an increase in prices between 2017 and 2018, as well as between 2018 and 2019. The market agents who, in 2017, had acquired a position in the delivery contract with a base load for 2018 would have paid an average price (46.25 €/MWh for Portugal⁵⁸) about 19% less than the price set in the spot market. Figure 3-13 presents the evolution of the average market closing prices related to the annual contract, in a base load delivery.

Figure 3-13 - Evolution of the average price for negotiating the annual futures contract (delivery in Portugal and in Spain), 2014 to 2019



Source: OMIE data. Note: the average closing price for the year prior to delivery, for a base load delivery (e.g. the 2019 price corresponds to the average price set during 2018).

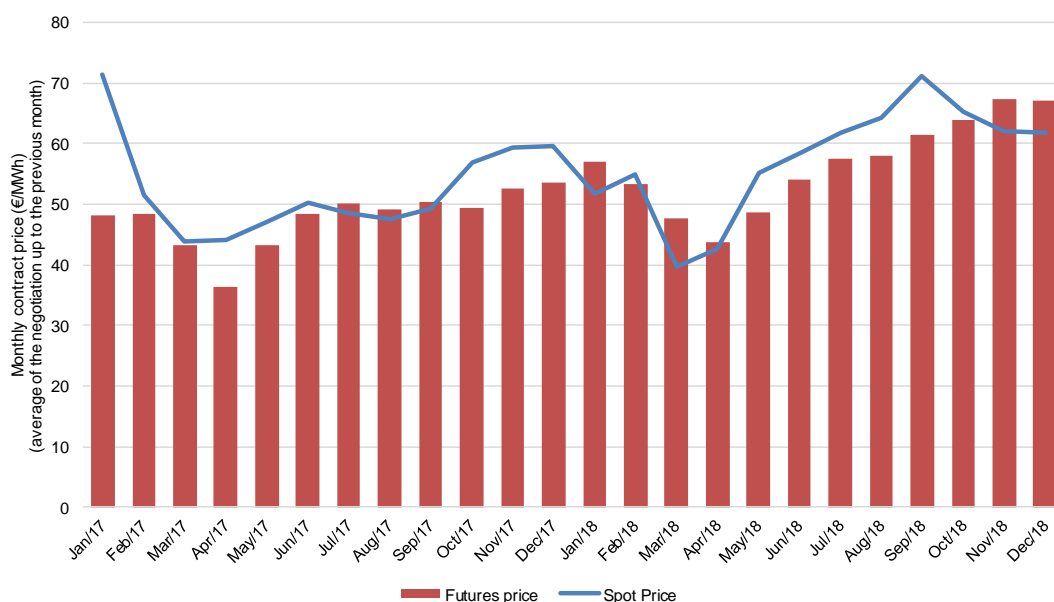
The negotiation of monthly future contracts with a base load delivery yielded a risk premium in forward contracting in January, March, April and November (difference between the forward price and the *spot* price, for the corresponding month), showing a relative decline of expectations with regard to the price set on the spot market. The situation was more favourable in the other months, and there was no risk premium

⁵⁸ The value of the forward provisioning price reflects the average weighted value per contract volumes of shares of the 2018 annual contract with delivery in the Portuguese area of MIBEL, including the record of auction, continuous and *over-the-counter* (OTC) operations.

against the spot market. 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.

Figure 3-14 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, a downward trend during the first quarter of 2018, a situation that was reversed from April onward.

Figure 3-14 - Evolution of the average price for negotiating the monthly futures contract (delivered in Portugal), 2017 and 2018



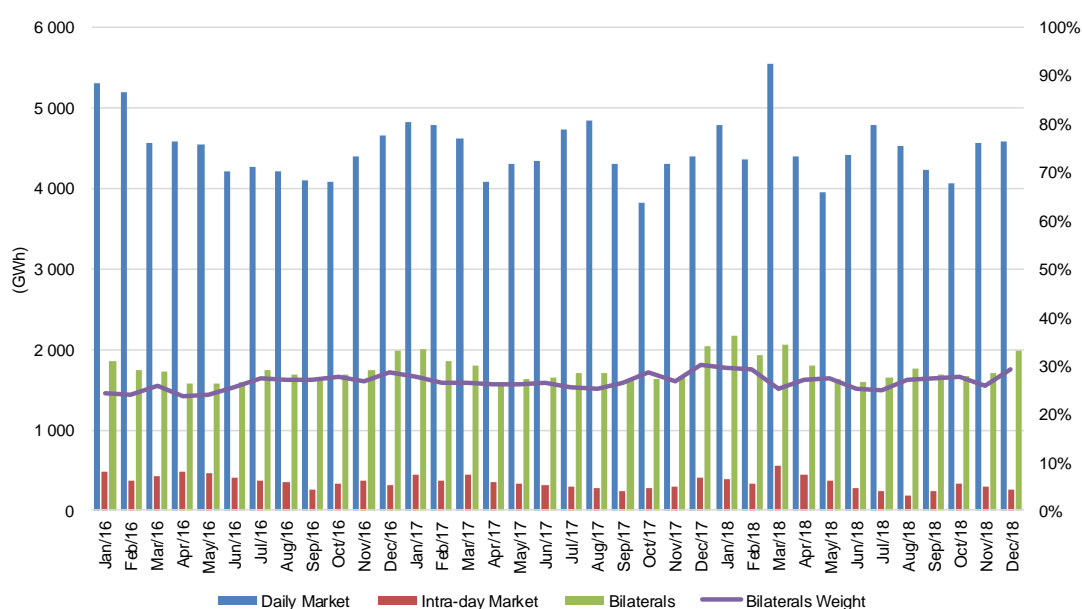
Source: OMIE and OMIP data

During 2018, as part of the application of the forward contracting mechanism for energy acquired from special regime generation, six guaranteed revenue SRG auctions were held, with the placement of five distinct products (one annual base load and four quarterly base loads). These six auctions resulted in the placement of a total hourly power output (volume placed) of 650 MW. The volume variation was carried out in full by the quantity modulation in the quarterly product (400 MW for each quarter) and the annual product (250 MW). The energy volume placed with this instrument amounted to approximately 11% of national consumption.

The auctions held for 2018 delivery ensured the full sale 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.

Regarding spot market negotiation (daily and intraday markets), in the case of Portugal, it is much higher than bilateral contracts trading, as shown in Figure 3-15. It is useful, however, to bear in mind that the acquisition of fixed-term products listed on the MIBEL forward market is settled in cash through the daily market.

Figure 3-15- Breakdown of energy supply volumes between markets, 2016 to 2018



Source: OMIE and REN data

In 2018, there was a slight increase, compared to 2017, both in the average weight of bilateral contracts and in its absolute value (increase of 3% equivalent to 0.7 TWh). It is worth mentioning that the energy volume associated with bilateral trading takes into account the taking of firm positions in the spot market by market agents.

Market evolution

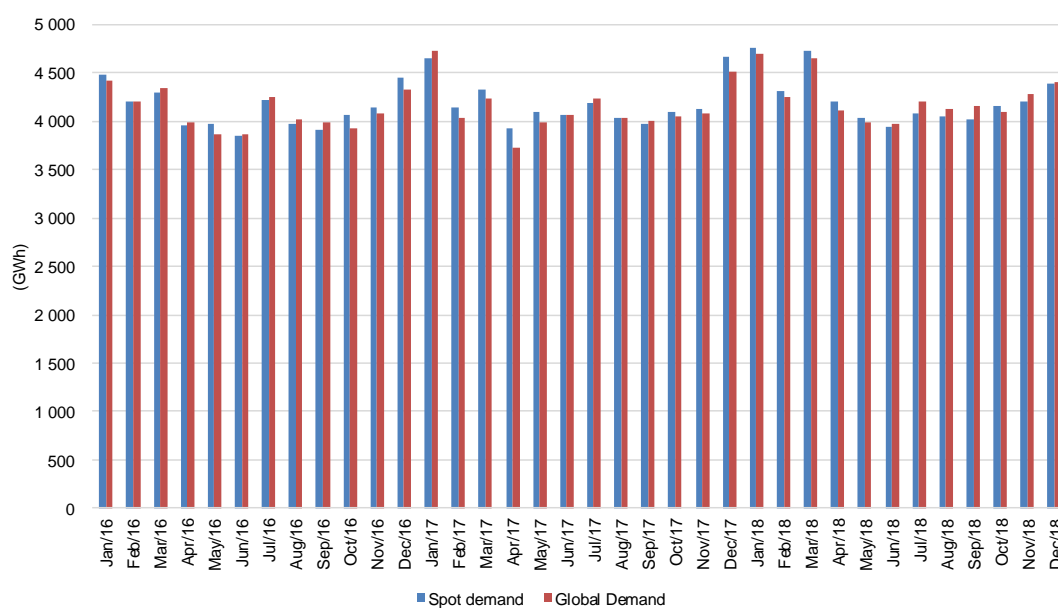
Spot contracting in the wholesale market in Portugal is part of the project to deepen MIBEL, i.e the single market for Portugal and Spain with an associated mechanism for dealing with congestion on a daily basis, based on market splitting whenever the flow of electricity generated by aggregated demand and supply

exceeds the commercial capacity available on the interconnection. The spot market contracting structure is characterised by the following aspects:

- On the demand side, the agents registered in Portugal, including the SLR, 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, the supply is placed on the spot market through the only SRG buyer - the SLR - 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 3-16, where it can be seen that demand is met by acquiring energy on the spot market.

Figure 3-16- Spot market demand and total monthly consumption, 2016 to 2018



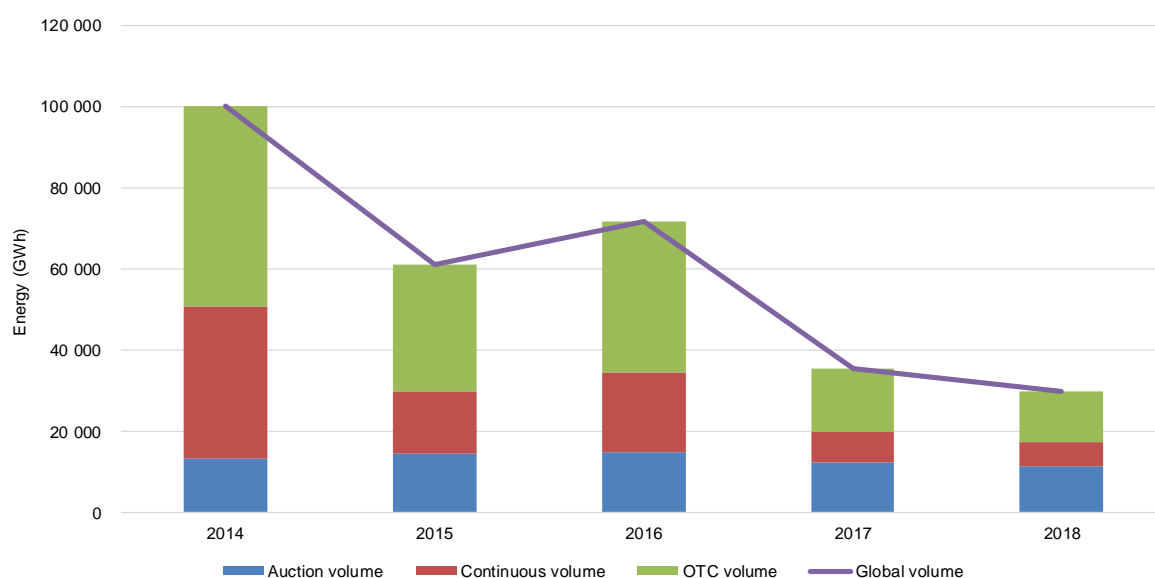
Source: OMIE data

Figure 3-17 shows the evolution of the volumes recorded in the organised forward market between 2014 and 2018.

In 2015, there is a drop of 39% in the overall trading volume. In 2016, there is an overall growth of 17% in liquidity, mainly due to an increase in the continuous market and over-the-counter (OTC) transactions. In

2017, there was a decrease in the overall trading volume of 51%, equivalent to 36 TWh. In 2018, another decrease was registered, namely 16% or 5.7 TWh.

Figure 3-17 - MIBEL forward market volumes, 2014 to 2018



Source: OMIP data

We should also highlight the fact that, from 2014 onwards, there were auctions for the initial allocation of contracts regarding financial rights over capacity on the Portugal-Spain interconnection, in both directions, which allows market agents to cover risks associated with the price differences between Portugal and Spain in addition to the SRG auctions that have also been held since 2012.

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 nearly eight years ago and are comparable to the requirements in the *Regulation on Wholesale Energy Market Integrity and Transparency (REMIT)*⁵⁹ regarding the obligation to

⁵⁹ Regulation (EU) n.º 1227/2011 of the European Parliament and of the Council on wholesale energy market integrity and transparency.

report insider information. The reporting of transactions and trading orders associated with contracts negotiated in organised market platforms across the entire European Union began on 5 October 2015, in accordance with the schedule provided for in Article 12 of the Commission Implementing Regulation (EU) n.º 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.

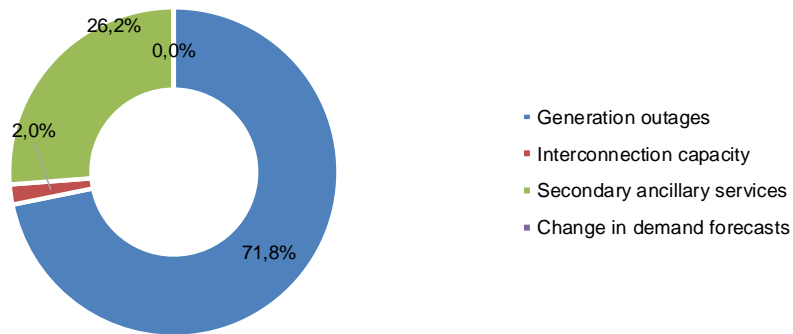
The reporting of transactions and trading orders associated with contracts related to electricity transmission concluded following an explicit primary capacity allocation by the transmission network operator and contracts negotiated outside the organised market platforms began on 7 April 2016 across the entire European Union. The calendar for this reporting was set out in Article 12 of the Commission Implementing Regulation (EU) n.º 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 included in the reporting obligations are the unplanned unavailability of electricity generation plants, updates on their status, in addition to network unavailabilities (transmission and distribution) which may affect consumption or price setting. Alterations of 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 REN⁶⁰. During 2017, 4,561 relevant facts were reported. Of these, approximately 72% concerned generation unavailability, 26% secondary ancillary services unavailability and 2% changes in the interconnection capacity available for the market and respective price setting in the context of MIBEL (Figure 3-18).

⁶⁰ <http://www.mercado.ren.pt/PT/Electr/InfoMercado/Paginas/default.aspx>

Figure 3-18 – Reporting of relevant facts, 2018

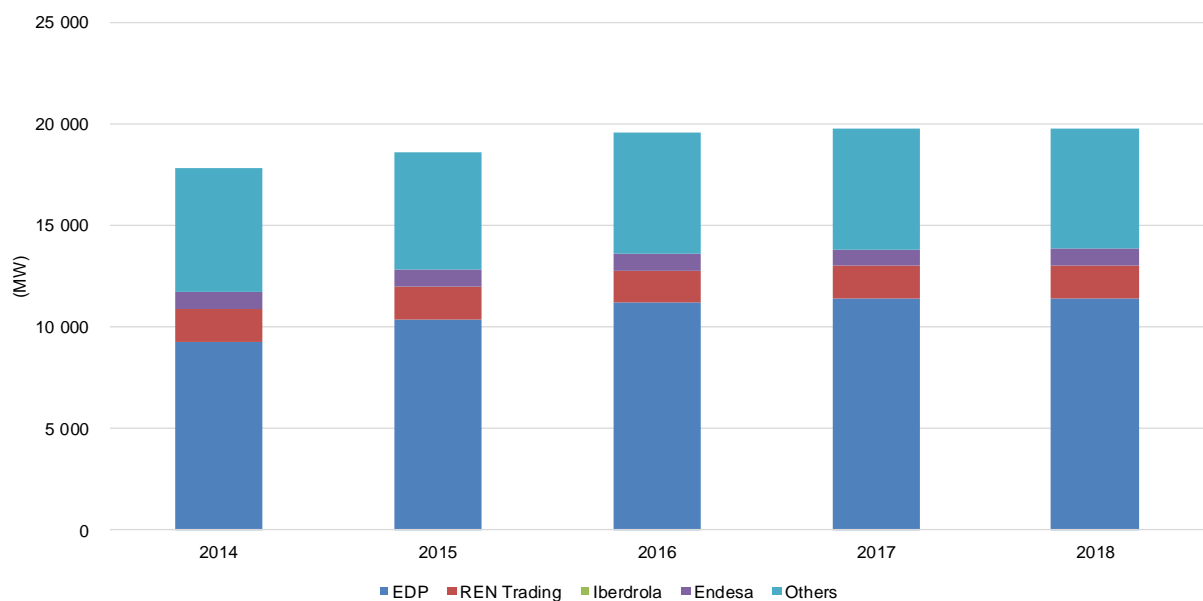


Source: REN data

COMPETITION EFFICIENCY

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 3-19 shows that the EDP group owns most of Portugal’s installed capacity.

Figure 3-19 – Installed capacity in Portugal by ownership, 2014 to 2018



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.

It is worth mentioning the suspension, from 1 April 2014 onwards, of the measures to minimise competition risks implemented by the Portuguese Competition Authority as part of the acquisition by EDP of the operation rights for the Alqueva and Pedrogão hydropower plants (EDIA). This acquisition resulted in an increase in the Group's installed capacity between 2013 and 2014.

These measures determined the concession of the Agueira/Raiva hydropower plant for a 5-year period; Iberdrola was granted those operation rights via an international tender, a development that had a residual impact on the growth of the EDP Group's share.

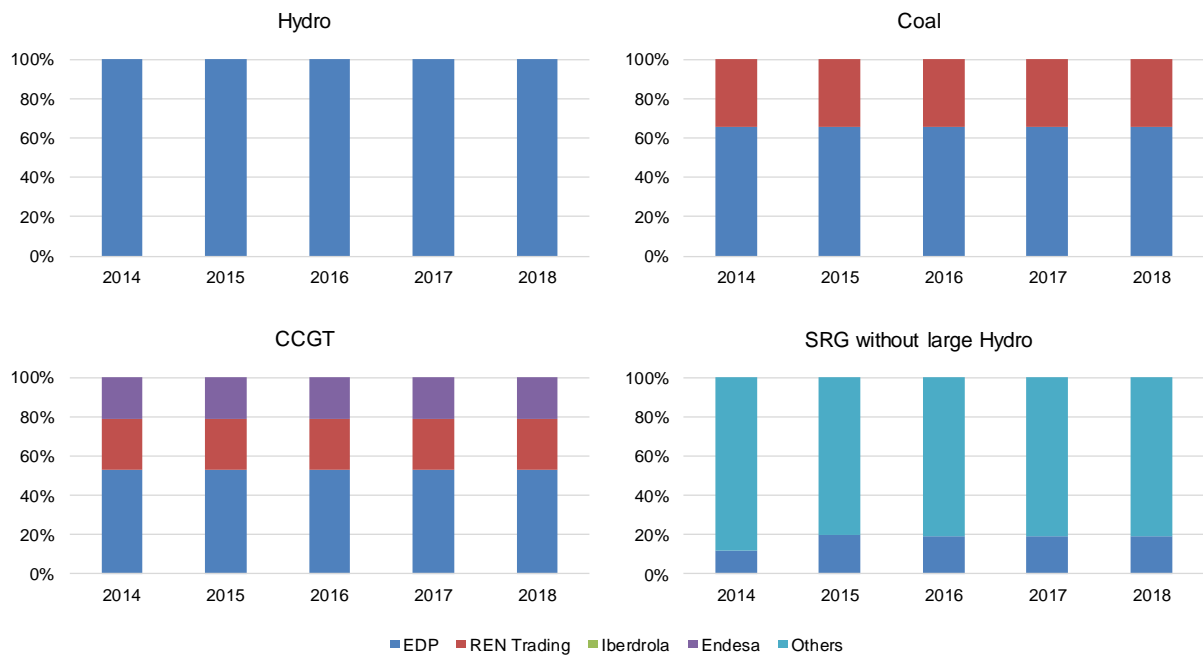
Therefore, following the identified trend, between 2016 and 2017, the EDP group increased its market share due to the commissioning of the installed capacity in the Venda Nova III (780 MW) and Foz Tua (236 MW) hydroelectric power plants.

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 3-20. 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 3-21, which presents the Herfindahl-Hirschman Index (HHI⁶¹) values, measuring corporate concentration.

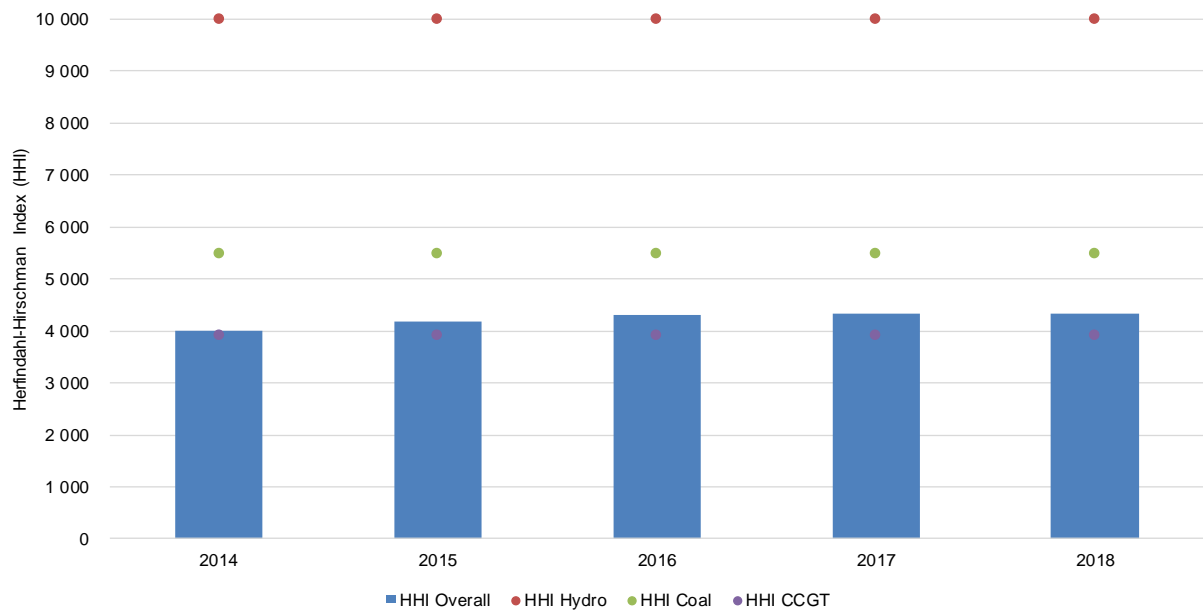
⁶¹ The Herfindahl-Hirschman Index (HHI) is a measure of concentration of businesses within the same activity sector and an indicator of the level of competition between them based on their market shares.

Figure 3-20 – Share of installed capacity by agents and technology for Mainland Portugal, 2014 to 2018



Source: REN data and EDP group

Figure 3-21 - Concentration in terms of installed capacity, 2014 to 2018



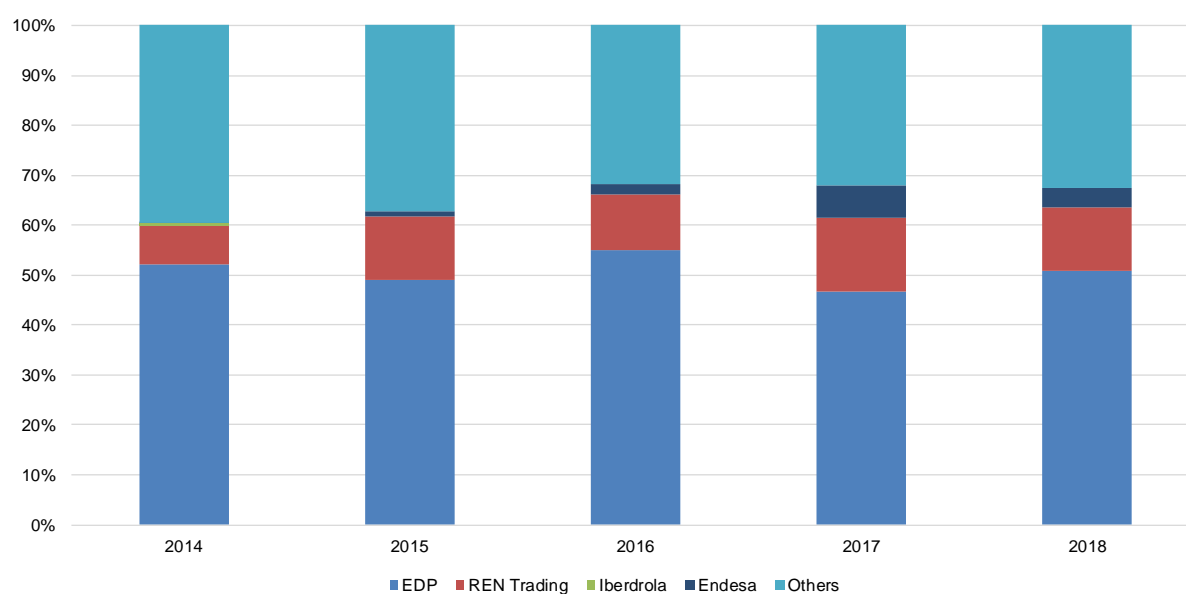
Source: REN data and EDP group

The HHI figures for installed capacity show that there were no significant changes in market concentration in the coal and natural gas combined cycle sectors.

The assignment, on 1 April 2014, of the operating rights for the hydroelectric plant of Aguieira/Raiva, which Iberdrola held by way of a tolling⁶² contract with the EDP group, reinforced the full dominance of the incumbent in hydro technology. That dominance continued in 2015, due to the entry of new hydroelectric power plants owned by the same incumbent. In 2016 and 2017, the integration of the Venda Nova III and Foz Tua hydroelectric power plants contributed to increase the concentration of capacity offer in the Portuguese system.

Electricity generation quotas by agent are shown in Figure 3-22, while the same evolution by technology and for SRG with guaranteed remuneration is presented in Figure 3-23.

Figure 3-22 - Energy generation quotas by agent, 2014 to 2018

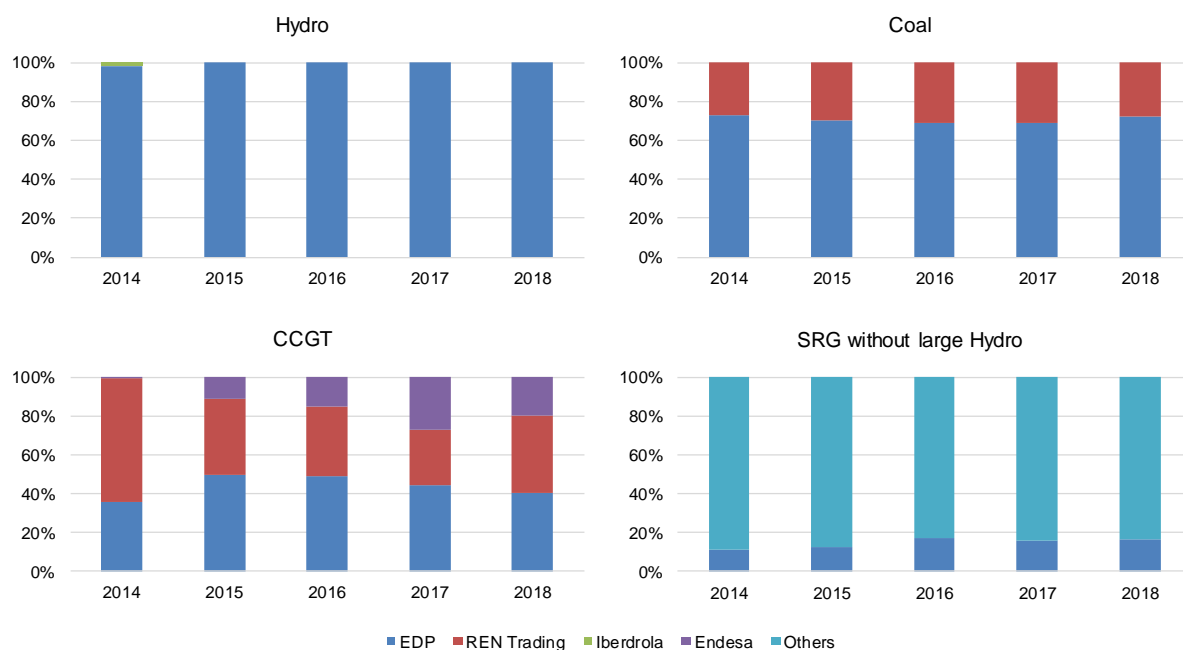


Source: REN data and EDP group. Does not include energy import figures.

For 2018, it is worth noting that there was an overall increase in the EDP Group's participation in total generation in mainland Portugal, mainly due to an increase in hydro generation due to more favourable hydrological conditions.

⁶² Bilateral generation agreement in which the owner of the power generation plant bears the operational risk, and the counterparty bears the market risk. That agreement defines a rent that the counterparty pays to the owner for the right to manage the power generation plant on the market.

Figure 3-23 - Energy produced by agents by technology, 2014 to 2018



Source: REN data and EDP group

Regarding energy production, the trend between 2014 and 2018 points towards a distinct evolution in the dominant operator EDP's generation quota in each of the main technologies.

In SGR, the EDP group saw its quota increased in 2016, mainly as a result of the consolidation of the ENEOP⁶³ wind assets, with an installed capacity of 613 MW, at the end of the first quarter of 2015. In 2017 and 2018, this situation remained unchanged.

In relation to hydro production, 2018 the exclusive presence of the dominant operator EDP continued, as it owns all the major hydroelectric plants.

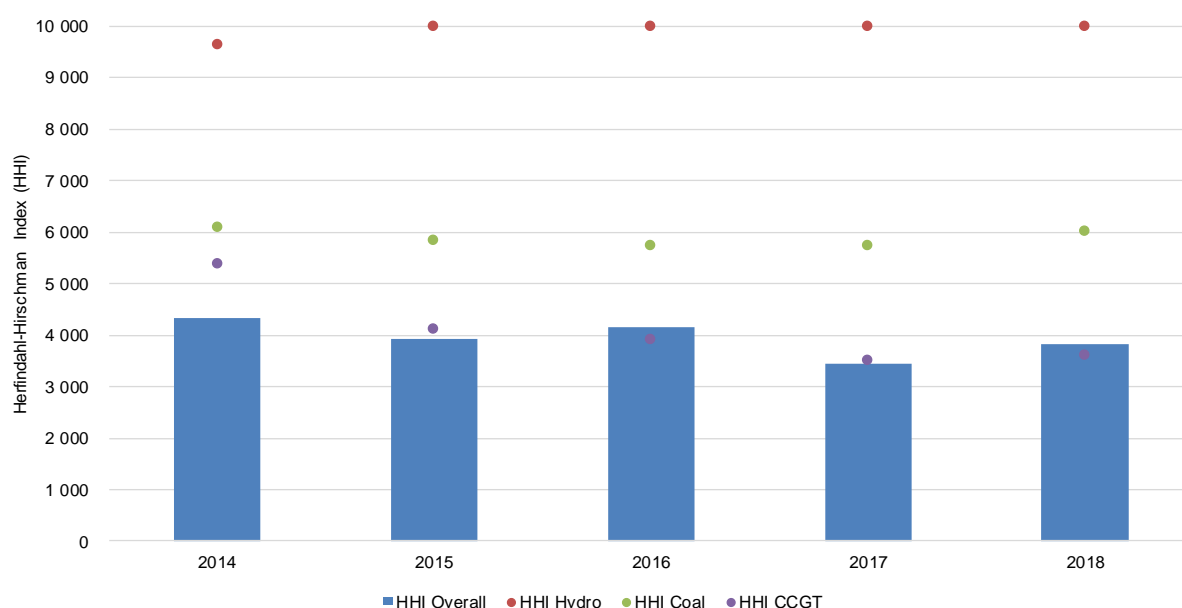
In the case of the natural gas combined cycle plants, there was a significant generation decrease in 2018, compared to 2017. This decrease of approximately 3.3 TWh, in absolute terms, included the decreased production of the generating assets held by the EDP Group and Endesa (Pego plant). The exceptions were the assets managed by REN Trading (Turbogás plant).

⁶³ ENEOP – Eólicas de Portugal, a former consortium of companies involved in wind projects in Portugal (EDP Renováveis, Enel Green Power and Generg), which installed a series of farms with a power of 1,200 MW.

Coal power plants also witnessed a significant production decrease in 2018. This decrease amounted to 2.5 TWh and resulted from decreases by the EDP Group and by the plant managed by REN Trading (Pego plant).

The concentration indicators for electricity generation presented in Figure 3-24 show that, in 2018, generation was more concentrated than in 2017. This evolution is mainly supported by the concentration increase in the EDP group's hydroelectric generation component.

Figure 3-24 - Concentration in terms of electricity generation, 2014 to 2018



Source: REN data and EDP group

At the same time, one should bear in mind that, as a more detailed analysis is not possible, the SRG with guaranteed remuneration not controlled by EDP are, for the purposes of calculating the concentration indicators, wholly in the hands of a single entity (a single market share). Accordingly, on the one hand, the true evolution of market concentration in the special regime generation category cannot be seen and, on the other hand, the figures for overall concentration will be equal to or greater than those that actually exist in the current market structure.

RESEARCH AND MEASURES TO PROMOTE EFFECTIVE COMPETITION

Within the framework of sectoral 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 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 players 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 sectoral regulation, namely through the regulations which must promote principles for the development of market competition. In terms of behavioural performance, ERSE, as the sectoral 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 2018, ERSE issued six opinions to the Competition Authority regarding the following concentration operations within the electricity sector:

- Opinion on the acquisition of exclusive control over Parque Eólico do Pisco S.A. (PEP) by INGKA Holding B.V. (IKEA Holding), both companies with operations in the electricity production segment. ERSE did not oppose this operation due to the small market share resulting from the operation (low power to influence wholesale prices).
- Opinion on the acquisition of exclusive control over Eol Verde – SGPS, S.A. (Eol Verde) by New Finerge, both companies with operations in the electricity production segment. ERSE did not oppose to this operation due to the small market share resulting from the operation (low power to influence wholesale prices).
- Opinion on the acquisition of exclusive control over Urbaser, S.A.U. (URBASER) by China Tianying Inc. (CHINA TIANYING), the former holding shares in the Portuguese electricity production segment. ERSE did not oppose this operation but indicated some reservations.
- Opinion on the acquisition of exclusive control by New Finerge over the following companies: Empreendimentos Eólicos do Rego, S.A.; Eolcinf – Produção de Energia Eólica, S.A.; Parque Eólico Vale de Abade, S.A.; Biowatt – Recursos Energéticos; S.A.; Eolflor - Produção de Energia Eólica, S.A. Before the operation, the companies to be acquired were held in 51% by New Finerge and in 49% by Catavento - Produção de Energia Eólica, S.A. (Catavento). All the companies involved in the

operation act in the electricity production segment. ERSE expressed its non-opposition to this operation subject to the submission of additional supporting documentation.

- Opinion on the acquisition of exclusive control (both direct and indirect) by Altri, SGPS, S.A. (Altri) over EDP Produção – Biolétrica, S.A. (EDP Biolétrica) by means of an Shares Sale and Purchase Agreement and an Assignment of Credits. Both companies are active in the electricity production segment. ERSE did not oppose this operation due to the small market share resulting from the operation (low power to influence wholesale prices).
- Opinion on the acquisition by AXPO International, S.A., of exclusive control over Goldenergy – Comercializadora de Energia, S.A (GOLDENERGY), company controlled jointly by the companies AXPO and Dourogás – Participações Sociais, S.G.P.S.. The operation was related to both electricity and natural gas supply activities. However, before this acquisition, AXPO did not have any activities related to natural gas supply in Mainland Portugal. ERSE expressed its non-opposition to the realisation of the operation.

REGULATORY DEVELOPMENTS

Transitional regime for managing guarantees

Recognising the need to change the management of risks and guarantees in the electricity and natural gas sectors, in particular with regard to the procedures and means to provide and update the guarantees and their costs and to the consequences of obligation breaches by market agents, ERSE launched a consultation on this issue in October 2016.

The conclusions of this consultation led to a more oriented regulatory review of the electricity sector in 2017. With the publication of the electricity RRC in December 2017, an integrated risk assessment model based on the provision of guarantees was established, which was subject to regulation to implement the operational details.

The approved regulatory framework foresees the existence of a single entity in charge of risk assessment and guarantee management. This entity is not yet in place, thus ERSE decided to adopt a set of transitional rules, which affirm the essence of the principles already taken in the RRC and which envisage the management of guarantees, the differentiation of behaviour of market agents and, consequently, a more

effective affirmation of competition in the Portuguese electricity sector along with containment of systemic risk.

The rules approved in Directive 11/2018⁶⁴, of 16 July, and previously subject to a direct consultation of interested parties, involving the TSO, DSOs and suppliers, provide flexibility so that suppliers can choose the terms of the payments to network operators, which is followed by a positive differentiation of compliant market agents.

Energy supply mechanism by the supplier of last resort

In 2018, a change was made to the RT⁶⁵ in order to adapt the energy acquisition mechanisms of the SLR, with impact on the determination of the energy tariff, considering the context of increased volatility of electricity prices in the wholesale markets, due to changes in the prices of CO₂ emissions allowances, natural gas, coal and oil. The energy prices applied by the SLR are fixed annually by ERSE, and the possibility of correction was not previously foreseen during the year. The misalignment of these prices with the evolution of the wholesale market prices hampers the repercussion of the energy prices of the organised market in the offers of the market suppliers, with negative impacts on the functioning of the retail market and, consequently, on consumers.

In order to provide the SLR with a model more suited to the wholesale market dynamics, ERSE approved a mechanism that provides indexation of the energy price based on the evolution of the electricity price in the futures market. In addition, it approved rules that allow ERSE to fix changes to the energy tariff automatically if there are significant imbalances between the effective energy cost and the energy tariff approved in the annual tariff calculation procedure.

3.2.2 RETAIL MARKET

Throughout 2018, we continued to witness a consolidation of the liberalised retail market, both in terms of the overall consumption of electricity and in 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 the suppliers; and enhanced

⁶⁴ [Directive 11/2018](#), establishes the transitional regime of risk and guarantees management in the national electricity system.

⁶⁵ Approved by [Rule 619/2017, of 18 December](#).

transparency in the communication of available offers to end-consumers, facilitated an increase in the number of suppliers that operate in the market, leading to greater market robustness.

Similarly, in terms of economic and market circumstances, the decrease in energy price differences between Portugal and Spain in the wholesale market encouraged the perception of lower commercial risks among suppliers that operate in Spain and who compete against other suppliers operating in the Portuguese market.

At the end of 2018, there were 29 suppliers operating on the market, 26 of which are present in the household consumers segment.

In 2018, 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 85% of household consumers were already in the liberalised market at the end of 2018 (2 percentage points (p.p.) more compared to the end of 2017).

The intensity of supplier switching was still high – around 16% in 2018 – 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, ERSE receives updated information from suppliers on the reference electricity prices they offer or expect to offer for all LV supplies, as well as on actual prices charged to consumers in the retail market⁶⁶.

ERSE uses data on average prices actually charged in the retail market, sent quarterly by suppliers, to monitor and supervise the electricity retail market. The data is also used as a tool to disclose average market prices, namely by official statistical data organisations (e.g., *Instituto Nacional de Estatística* – INE, the Portuguese Statistics Office, and Eurostat, at European level).

⁶⁶ [Order n.º 18637/2010](#), of 15 December.

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 are the supplier's basic standard offer, thus not inhibiting the application of differentiated contractual conditions such as discounts or other promotional campaigns. This information must be sent on an annual basis (end of January) and whenever there is a change in prices or contractual conditions.

ERSE incorporates information on electricity offers on its website in simulation and decision-making support tools for consumers⁶⁷, which are described in the following section dedicated to transparency. Since the second quarter of 2017, ERSE has also started publishing quarterly newsletters on reference market prices in LV⁶⁸.

The analysis of standard offers sent by suppliers, with reference to the end of December 2018 and for the representative household customer⁶⁹, showed that there were 19 suppliers operating in the market. In addition, a total of 109 electricity-only offers and 63 dual offers (electricity and natural gas), totalling 172 commercial offers, continued the growth trend in the number of offers. Three of the suppliers also had offers with additional energy services, like for example, technical assistance services and energy audits, and prepayment commercial offers.

In the period mentioned above, the electricity-only commercial offer with the lowest annual electricity bill (844 €/year) was 21% cheaper than the most expensive one (-227 €/year). The dual (electricity and natural gas) commercial offer with the lowest annual electricity bill amounted to 822 €/year, and corresponded to a discount of approximately 20% compared to the most expensive dual offer (-208€/year)⁷⁰.

Figure 3-25 shows the evolution of the prices of market offers, as well as the values of the transitional tariffs associated with the simple and bi-hourly options, in 2017 and 2018. In 2018, the commercial offers showed a decrease in the maximum prices when compared to 2017, as a result of a new commercial offer high above the transitional tariff. As regards the minimum prices of commercial offers, prices remained stable during 2018, with a slightly increase in the price of only one service offer (electricity).

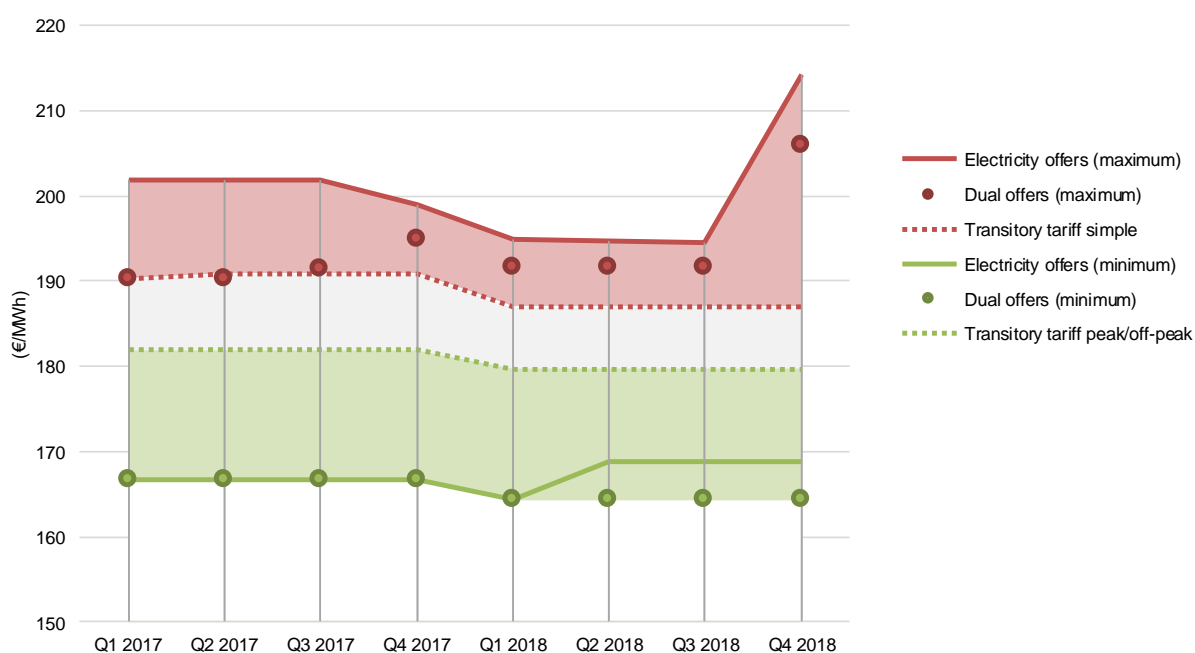
⁶⁷ At <http://www.erse.pt/pt/simuladores/Paginas/Simuladores.aspx>.

⁶⁸ [Newsletter of the Electricity Commercial Offers](#).

⁶⁹ 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.

⁷⁰ Real prices with no taxes or levies.

Figure 3-25 - Price of commercial electricity offers (electricity-only and dual fuel) for consumer type 2 in 2017 and 2018



Source: ERSE data

TRANSPARENCY

Aiming at providing information to electricity consumers on market reference prices, as well as tools to help them choose a supplier, ERSE continues to offer and update online simulators on its website with objective information to help electricity consumers make an informed choice, namely regarding the selection of the best offer in the market; these are:

- Market price comparison simulator for StLV supply in mainland Portugal⁷¹.
- Simulation of contracted capacity⁷².
- Electricity Labelling Simulator⁷³.

⁷¹ Available at <https://simulador.precos.erse.pt> (Portuguese only, until 2017).

⁷² Available at <https://simulador.potencia.erse.pt/> (Portuguese only).

⁷³ Available at <http://simuladores.erse.pt/rotulagem>.

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

In addition to this simulator, ERSE also provides on its website all the information on reference prices and other contractual conditions that support the functioning of the simulator, thus allowing for the collection of historical data covering all the standard commercial offers available in the market.

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 approved⁷⁴ 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. This measure helps consumers to have effective access to information and also to have comparable information between different offers.

In 2018, ERSE approved the minimum content and the way of providing information to customers, regarding the equivalent regime⁷⁵, which obliges suppliers to present in the 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 price, the consumer might, at any time, end the supply contract with the supplier and switch to the SLR or another supplier that has the same prices as the transitional or regulated tariffs.

In regulatory terms, suppliers with more than five thousand customers⁷⁶ continue to be obliged to disclose publicly their commercial offers⁷⁷, as well as the general conditions of contracts for StLV customers. Additionally, when expressly requested to, the supplier must submit a proposal for the supply of electricity

⁷⁴ [Directive n.º 6/2015](#), of 27 April (Portuguese only).

⁷⁵ Approved by [Law n.º 105/2017, of 30 August](#) and [Governmental Decree n.º 348/2017, of 14 November](#).

⁷⁶ 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."

⁷⁷ Through the media involved, as well as on the internet.

within 8 business days, for LV customers, and within 12 business days, for all the other customers, from the date on which the request was made by the customer.

There are also rules in force concerning the information included in the invoices sent to customers, namely information regarding the cost of network access tariffs and CIEG⁷⁸ as well as labelling of electricity⁷⁹.

Also with regard to electricity bills, ERSE approved, through Directive n.º 14/2016, of 26 July, additional obligations on electricity suppliers, obliging them 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 Guide⁸⁰. With regard to metering rules, EHV, HV, MV and SpLV facilities are equipped with remote metering systems (telemetry), with daily collection of four-hourly records. In facilities connected in StLV, readings are done locally, every 3 months, for 2/3 of the facilities and are done remotely, every month, for 1/3 of the facilities. The distribution network operator is obliged to provide a toll-free telephone assistance service to all its customers so they can submit their own readings⁸¹. The meter readings provided by the customer and by the DSO have the same legal value for billing purposes.

COMPETITION EFFICIENCY

The liberalisation of the electricity sector in Mainland Portugal has progressed gradually, with the liberalised market consolidating its position, mainly due to the process of extinguishing regulated tariffs that, in January of 2013, started to cover all the clients, including household customers.

The evolution of consumption and number of customers in the liberalised market in Mainland Portugal can be seen in Figure 3-26.

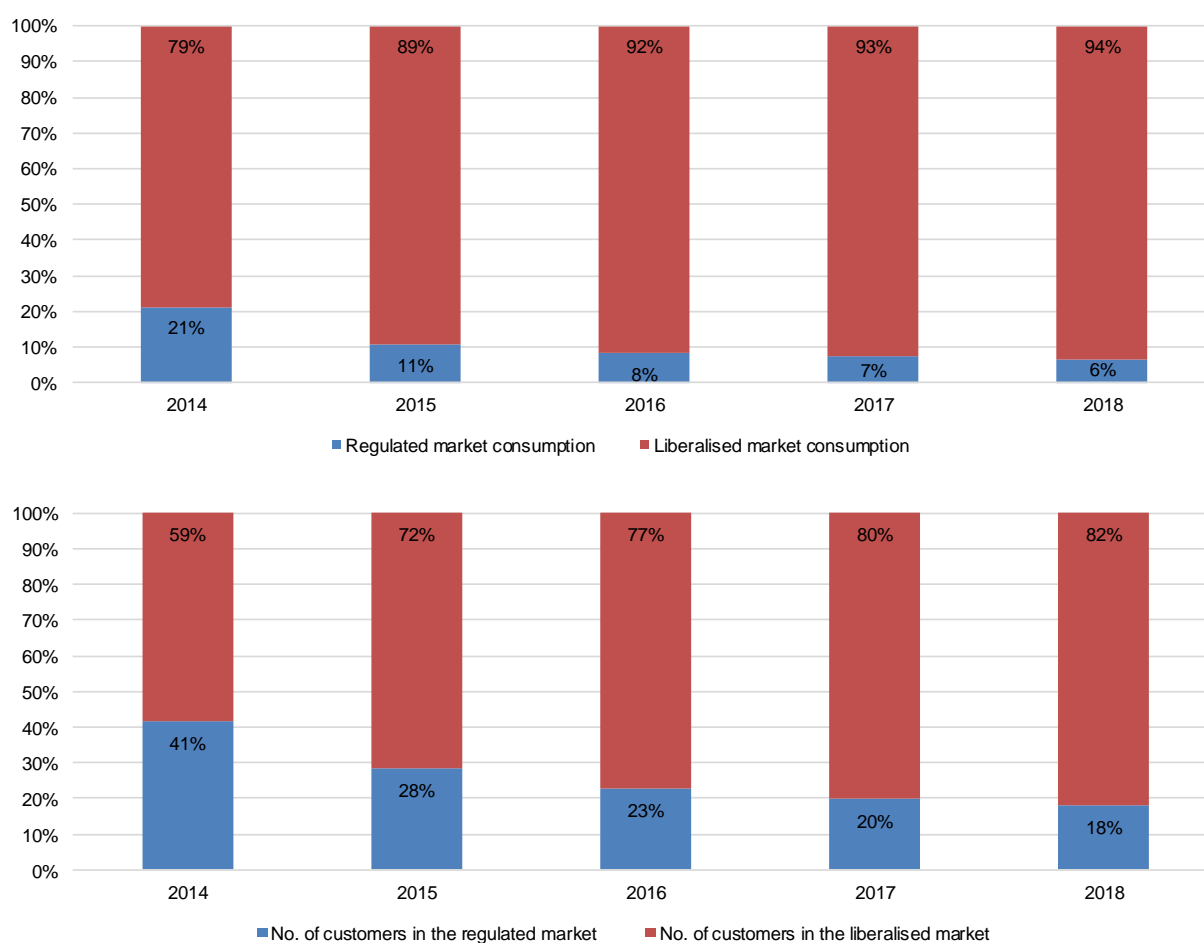
⁷⁸ Articles 121 and 132 of the electricity [RRC](#) (Portuguese only).

⁷⁹ Articles 105 e 133 of the electricity [RRC](#) (Portuguese only).

⁸⁰ [Directive n.º 5/2016, of 26 February](#) (Portuguese only).

⁸¹ Article 35 of the electricity [RQS](#).

Figure 3-26 – Breakdown of consumption and number of customers in the regulated and the liberalised markets, 2014 to 2018



Source: REN and EDP Distribuição data

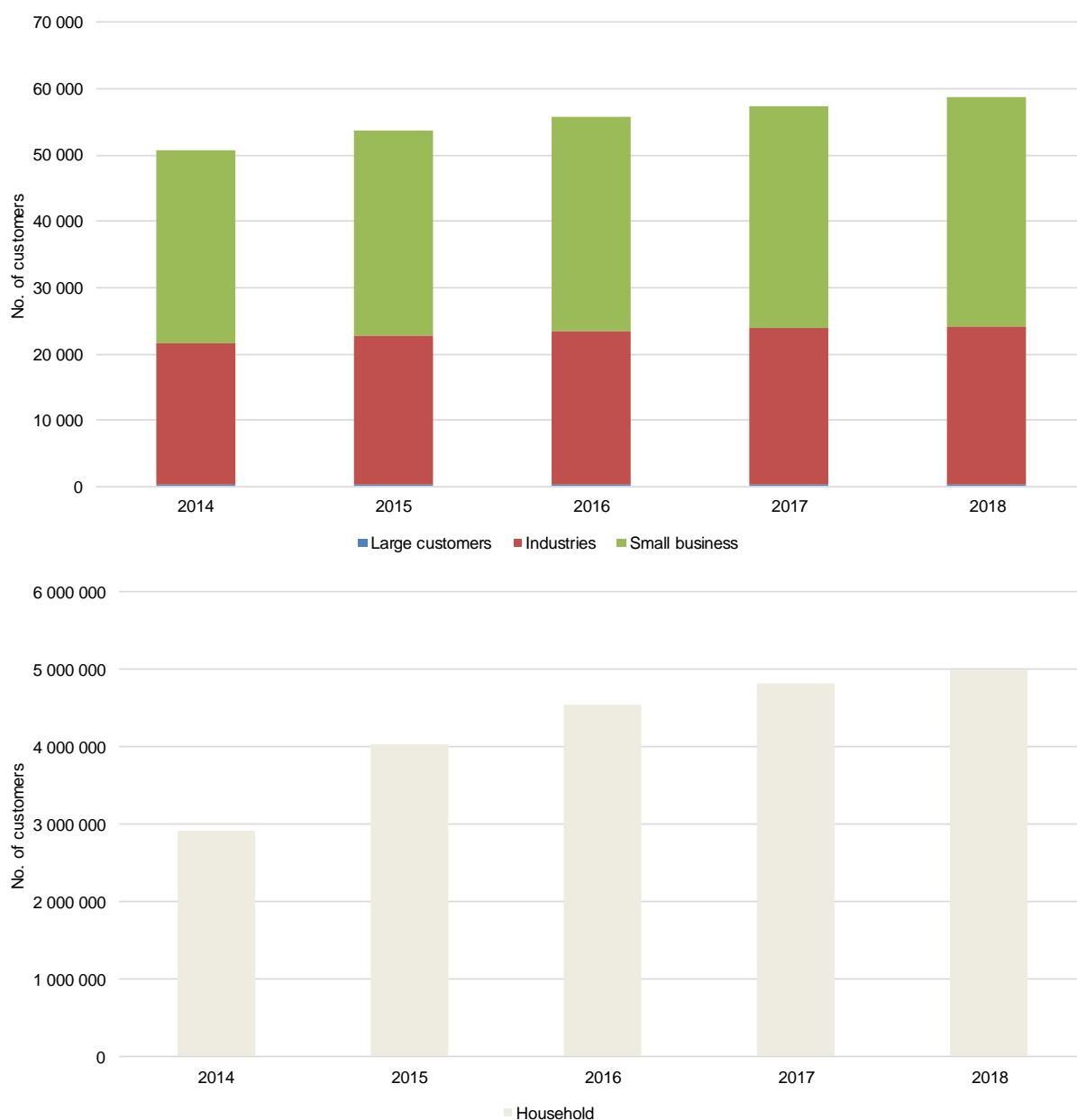
The extinction of regulated tariffs, as explained previously, has contributed to the increase of the liberalised market dimension. With this evolution, the consumption in the liberalised market represented approximately 94% of total consumption at the end of 2018.

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 2018 increased by nearly 3% compared to the previous year.

As regards the number of household customers, and despite the fact that this customer segment still has a low penetration in the liberalised market, approximately 85% of the customers in this segment have already made the transition to the liberalised market.

Figure 3-27 shows that in 2018 the segments with higher consumption – large customers (EHV⁸² and HV), industrial customers (MV) and small businesses (SpLV) – continue to witness growth between 1% and 3% in the liberalised market.

Figure 3-27 - Evolution of the liberalised market in Mainland Portugal, 2014 to 2018

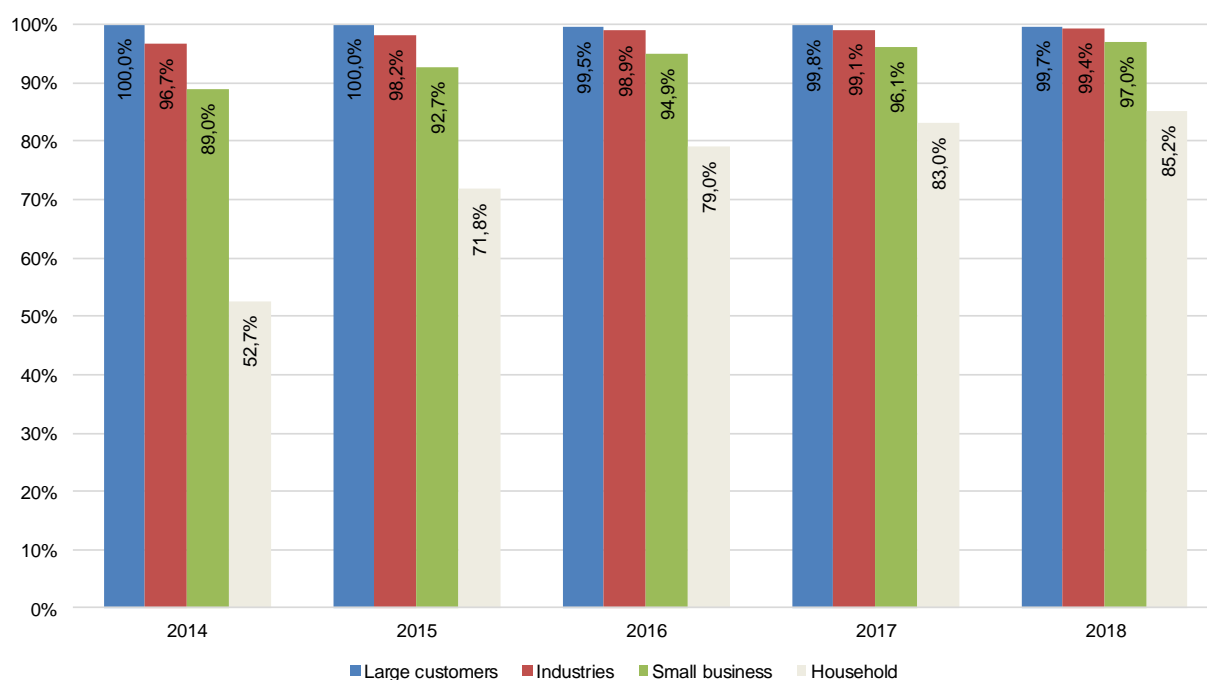


Source: EDP Distribuição data

⁸² 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 3-28, and it can be noted that in 2018 almost all the consumption by large customers was ensured by market suppliers. The same happened with approximately 99% of consumption by industrial customers.

Figure 3-28- Penetration of the liberalised market by customer segment, 2014 to 2018

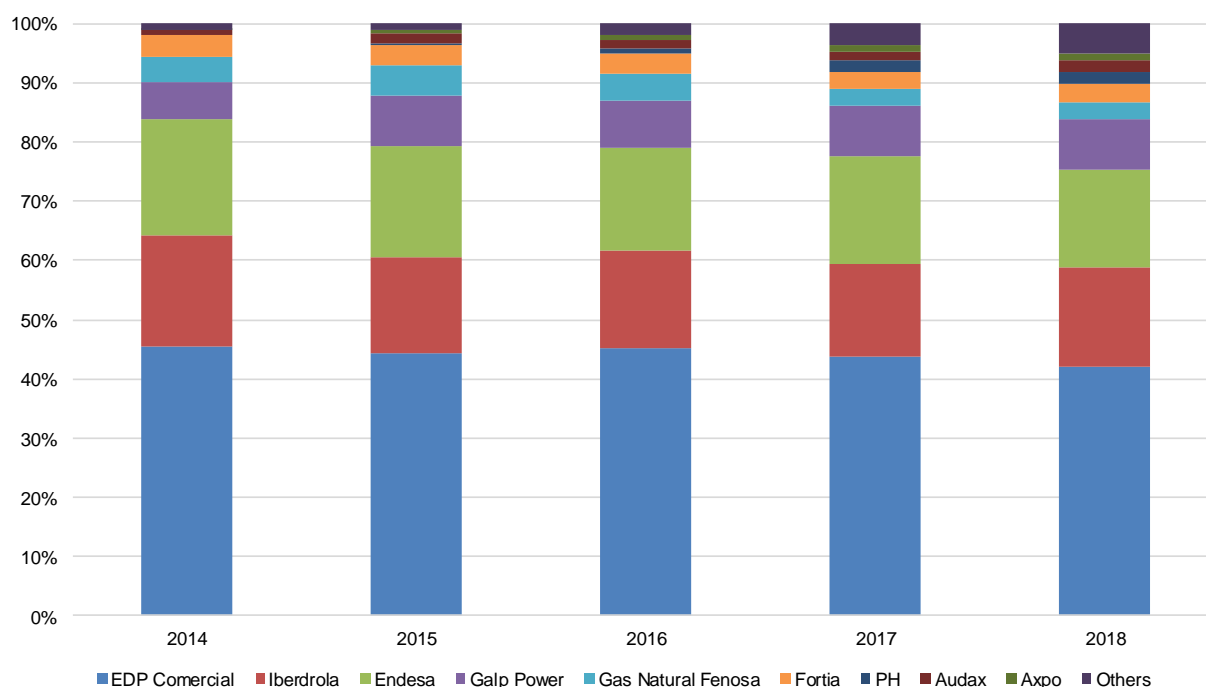


Source: EDP Distribuição data

In the liberalised market, an analysis by segment indicates that the industrial customer segment is the most competitive of all, while the household customer segment had the most market concentration, with the number of suppliers in this segment continuing to increase in 2018.

Despite the growth of the liberalised market, overall business concentration remained high in 2018. The EDP Group's high market share, the leading operator in the electricity market mainly in the household customers segment, was the factor that contributed the most to this situation, as this liberalised market supplier continued to account for approximately 42% of supply in 2018 (44% in 2017), as shown in Figure 3-29.

Figure 3-29 - Supply structure in the liberalised market by supplier, 2014 to 2018



Source: EDP Distribuição data

Despite the downward trend, supplier switching rates are still relevant: in 2018, approximately 16% of electricity consumers switched supplier, as shown in Figure 3-30. Switches within the liberalised market represented approximately 59% of the total number of supplier switches. Switches from the regulated market to the liberalised market represented about 40% of the total switches of this kind.

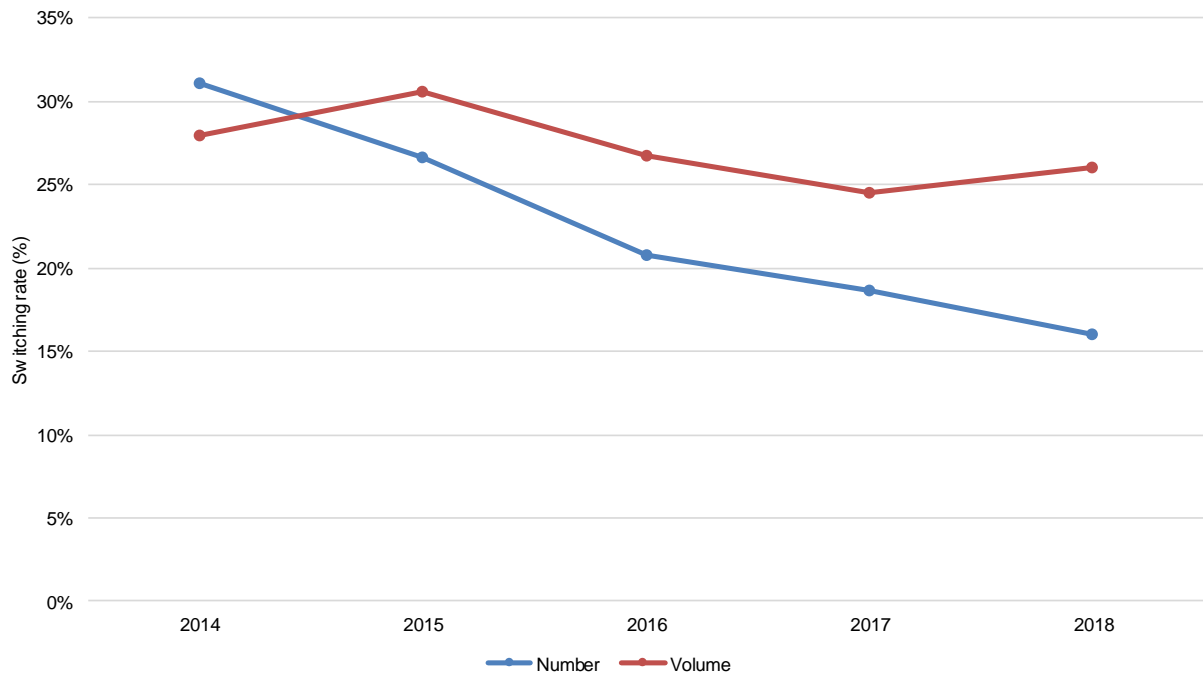
In terms of the number of customers, 13,558 returns to the regulated market were registered in 2018, and 11% of this amount is related to reassignment of consumers to the LSR following cases of failing suppliers (bankruptcy). Regarding consumption, all returns registered correspond to a consumption of around 143 GWh, and 17% of the consumption that returned to the SLR was due to these bankruptcy reassignments.

When comparing the consumption of customers who returned to the SLR with the total consumption of customers that changed supplier in the liberalised market, it is possible to verify that this value is very insignificant, since returns to the SLR only correspond to 2% of consumption in terms of switches within the liberalised market.

In December 2018, the number of customers leaving the SLR in order to integrate the portfolio of a market-based supplier was substantially lower (about 1/4) than the number of consumers who switched suppliers

within the liberalised market, consolidating the growing trend of market-based supplier switching within the framework of the liberalised market.

Figure 3-30 - Supplier switching, 2014 to 2018



Source: EDP Distribuição data

An analysis of the evolution of the retail market is available on the ERSE website in the form of a monthly report⁸³, which provides information regarding issues linked to competitive pressure on the market and on each of its segments.

⁸³ <http://www.erse.pt/pt/electricidade/liberalizacaodosector/informacaosobreomercadoliberalizado/2016/Paginas/2016.aspx>

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

RECOMMENDATIONS FOR SUPPLY PRICES

During 2018, ERSE did not publish recommendations regarding the compliance of supply prices with Article 3 Directive 2009/72/EC of the European Parliament and of the Council, of 13 July. The transitional regime for regulated electricity tariffs for end-customers in StLV, SpLV, MV and HV remained in force.

MEASURES TO PROMOTE EFFECTIVE COMPETITION

In 2017, there was a review of the electricity sector regulations, which introduced a large set of changes, entering into force at the beginning of 2018. These changes influenced the functioning of the electricity retail market with the objective of increasing competition. The revision also changed the rules in relation to electricity labelling, with the objective being to change the allocation of energy under special regimes.

The new rules allow the existence of suppliers with a 100% renewable mix and allow suppliers to further differentiate their offers. The regulatory review that was motivated by recent market developments justified a revision of the existing rules in order to make clear that suppliers are allowed to present 100% renewable offers, reflecting in their mix the effective use of guarantees of origin, and to simplify procedures, with the publication of Directive n.º 16/2018, of 13 December, establishing rules for Electrical Energy Labelling.

Finally, the review introduced changes to the management of guarantees in order to promote better retail market functioning and allowing for more effective competition by mitigating the system risk due to suppliers' non-compliance with contracts for the use of networks and for system services between market agents and system operators. Thus, the new framework introduced the role of guarantees manager, which centralises the management of guarantees for those contracts, with the advantage that suppliers have a single entity to interact with in relation to guarantees and also are also able to reduce the risk of defaulting. The guarantees manager should apply evaluation of risk principles that differentiate between entities with a history of compliance and entities with a history of delays or defaults, the latter being penalised in the calculation of the guarantee to be provided.

Pending the entry into force of a subregulation provided for in the RRC and the gradual convergence towards a new sectoral framework in this area, ERSE published Directive n.º 11/2018, of 16 July,

establishing a transitional regime for the risk and guarantees management in the National Electrical System, which changed the existing model with the objective of strengthening the risk evaluation and prevention in this system.

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

Since 1 January 2013⁸⁴, electricity tariffs for end-customers published by ERSE for Mainland Portugal have a transitional nature⁸⁵. In 2018, these tariffs applied to HV, MV, SpLV and StLV⁸⁶ supply delivered by the supplier of last resort; transitional EHV tariffs were abolished, given that the supplier of last resort was no longer delivering supply to this voltage level.

Transitional tariffs for end-customers in force from 1 January 2018 onwards are determined by the sum of network access tariffs with the transitional energy tariff and the regulated commercialisation tariff⁸⁷, all approved by ERSE⁸⁸.

REGULATORY DEVELOPMENTS

PROCESS FOR SUPPLIER SWITCHING

Decree-Law n.º 38/2017, of 31 March, created the “Logistics Operator for Switching Electricity and Gas Supplier” (OLMC), common to the electricity and natural gas sectors, whose functions were temporarily assigned by ERSE to the medium-voltage (MV) and high-voltage (HV) electricity distribution network operator and to the natural gas transmission network operator for each sector, respectively.

The same Decree-Law indicated that the activity of OLMC is attributed to ADENE, which is responsible for the operationalisation of supplier switching in the electricity and natural gas sectors and for the

⁸⁴ Under the Decree-Law n.º 75/2012, of 26 March.

⁸⁵ For the other voltage levels (EHV, HV, MV and SpLV) is applicable the Decree-Law n.º 104/2010, of 29 September, in the redaction of its subsequent changes.

⁸⁶ The [Decree-Law n.º 15/2015, of 30 January](#), has changed the Decree-Law n.º 75/2012, of 26 March and has changed the way of establishing the application period of the respective transitional tariffs for electricity supplies to StLV final consumers. The application period of the transitional tariffs to StLV final consumers was changed to 31 December of 2020 by [Law n.º 42/2016, of 28 December](#), [Government Ordinance n.º 39/2017, of 26 January](#), and [Government Ordinance n.º 364-A/2017, of 4 December](#).

⁸⁷ The transitional tariff regime is determined by the joint application of [Government Ordinance n.º 108-A/2015, of 14 April](#), and [Government Ordinance n.º 359/2015, of 14 October](#). [Order n.º 7557-A/2017, of 25 August](#) is also applicable. It revoked Order n.º 11 566-A/2015, of 3 October.

⁸⁸ [Directive n.º 2/2018, of 4 January](#).

management and maintenance of the platform for changing supplier and providing information. Given that the OLMC is common to both sectors, new procedures⁸⁹ have been developed to accommodate this new reality, common to electricity and natural gas, safeguarding the specificities of each sector, where they exist.

These switching procedures, similarly to the previous ones, are standardised and define all actions and deadlines that involve the switching of supplier in the electricity and in the natural gas sectors, considering the principles of equal treatment and systematisation of processes. The switching procedures also include the support systems needed to switch supplier, including the information obligations to ERSE, as well as the procedures of the audits to be carried out.

The recent switching procedures, common to both sectors, are particularly prominent in a situation of a fully liberalised electricity and natural gas markets, with significant levels of switching. The changes made to these procedures reflect the importance given by ERSE so that, regardless of the entity responsible for the process, the final result is transparent and of neutral perception for consumers.

Equivalent regime for transitional tariffs

Decree-Law n.º 105/2017, of 30 August, enshrined in law the possibility for domestic electricity consumers to choose to apply the regime equivalent to that for transitional or regulated tariffs, during the period in which these are in force. The provisions of the Decree-Law were implemented through Administrative Rule n.º 348/2017, of 14 November, which defines the procedure to access the equivalent regime. Some aspects of the regime are fulfilled by an ERSE regulation.

Under the terms of Administrative Rule n.º 348/2017, of 14 November, specifically as defined in Article 3(3), market suppliers must disclose whether or not they apply the equivalent regime for transitional or regulated tariffs. The form of such disclosure is regulated by ERSE, in accordance with Article 5(1). On the other hand, Administrative Rule n.º 348/2017, of 14 November, also determines that the amount of the difference between the tariff applied by the market supplier and the tariff which is equivalent to the transitional or regulated tariffs must be presented in the invoice, regardless of whether the trader makes available or not the regime.

⁸⁹ Approved by [Directive n.º15/2018](#), of 10 December.

In addition, it was incumbent upon ERSE, through Directive n.º 1/2018, of 3 January, to regulate the minimum content and the form of information provided to consumers, regarding both the exercise of the regime and the presentation of the value of the difference between the tariff applied by the market supplier and the tariff which is equivalent to the transitional or regulated tariffs.

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 acquired by the SLR 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 5 following years⁹⁰.

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 Article 73-A.

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 main elements of the tariff deficit for the electricity sector in 2018 are shown in Table 3-11 .

Table 3-11 – Tariff deficit, 2018

	Outstanding debt in (10³ EUR)
Tariff deficit 2009	762 234
2015 SRG additional cost deferral	381 746
2016 SRG additional cost deferral	629 295
2017 SRG additional cost deferral	999 279
2018 SRG additional cost deferral	881 196
Total	3 653 750

⁹⁰ Through the publication of Decree-Law n.º 78/2011 of 20 June, specifically article 73-A.

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 DGEG⁹¹. However, ERSE monitors the evolution of the installed capacity and the evolution of demand, which is addressed in greater detail below.

With a view to assessing the regime for the allocation of incentives to ensure the security of the National Electricity System (SEN), in June 2016, ERSE published its technical assessment report⁹². The report established as its main recommendation the understanding that a possible review of the capacity mechanism payments should be guided by the creation of a mechanism governed by market rules, in line with the European framework in this area and properly structured at regional level within the framework of MIBEL.

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

CAPACITY MECHANISM PAYMENT – INCENTIVE FOR INVESTMENT

The allocation of incentives for investment related to capacity mechanism payments are set in Portaria n. 251/2012, of 20 August, and are applicable to:

- Hydropower plants that have been granted a license between the publication of Decree-Law n.º 264/2007, on 24 July, and of Portaria no 251/2012, 20 August, or those hydroplants 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 have been granted a license by 31 December 2013.
- Reversible hydropower plants whose installed capacity have been increased and were granted a generation license by 21 August 2012.

This incentive for investment is granted to each eligible hydropower plant during the first ten years of operation. The incentive value to be allocated to each plant is calculated annually, resulting from the product of installed capacity, the availability index, the index of compliance with the commissioning date

⁹¹ In accordance with Decree-Law n.º 29/2006 of 15 February, as amended by Decree-Law n.º 215-A/2012 of 8 October, and with Decree-Law n.º 172/2006 of 23 August, as amended by Decree-Law n.º 215-B/2012 of 8 October.

⁹² <http://www.erse.pt/pt/supervisaodemercados/mercadoelectricidade/capacidade/Paginas/default.aspx>

set in generation license, and an annual reference value⁹³. In 2018, the incentive resulted in a total cost of 19.8 million euros.

SECURITY RESERVE

Decree-Law n.º 172/2006, of 23 August, altered and republished by Decree-Law n.º 215-B/2012, of 8 October, provides for the creation of a mechanism for the allocation of incentives for reserve capacity made available by power producers to the SEN. 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 a Portaria from the member of the government responsible for energy.

In this context, Portaria n.º 251/2012, of 20 August established the regulatory framework for the security reserve in Portugal. Later, through Portaria 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 SEN security reserve.

The 2018 auction referring was postponed, and the Government clarified that it is postponed until the European Commission clearly pronounces itself on the compatibility of this security reserve mechanism with European provisions concerning aid state to the energy sector⁹⁴. Thus, for 2018 availability contracts were concluded for the security reserve regime and, consequently, the SEN incurred no cost.

INTERRUPTIBILITY

According to the Regulation⁹⁵ 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 Portaria n.º 592/2010, interruptibility will allow

- a) a quick and effective response to emergency situations;

⁹³ Value published for each power plant with values ranging from 11 000 to 22 000 €/MW.

⁹⁴ Portaria n.º 93/2018, of 3 de April.

⁹⁵ Portaria n.º 592/2010, of 29 July, with the subsequent amendments made to it.

- b) improve the flexibility of system operation; and
- c) improve security of supply.

According to information released by the TSO for the 12-month period of interruptibility service, from 1st November 2017 to 31st October 2018, 48 interruptibility agreements were registered and a total interruptible capacity of 677.2 MW was reached. It should be noted that there was no need to issue any downward instruction related to the interruptibility service. The total cost of service for this 12-month period was around 108.4 million euros.

Portaria 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. Two installations of the 48 with active interruptibility agreements failed the tests.

3.3.1 MONITORING THE BALANCE BETWEEN SUPPLY AND DEMAND

The 2018 capacity margin, defined as the difference between installed capacity and the maximum load in relation to installed capacity, was 56%, remaining unchanged compared to 2017. The evolution of installed capacity and peak load is shown in Table 3-12.

Table 3-12 - Capacity margin of the SEN

	2017 (MW)	2018 (MW)	2018/2017 Change (%)
Total installed capacity	19 800	19 953	0.77
Renewable capacity	13 397	13 552	1.16
Non-Renewable	6 403	6 401	-0.03
Maximum peak load	8 771	8 794	0.26
Capacity margin	11 029	11 159	1.18
	-56%	-56%	

Source: REN data.

Table 3-13 presents total electricity consumption and its supply sources, in 2017 and 2018.

Table 3-13 - Consumption supply

	2017 (GWh)	2018 (GWh)	Change (%)
Total generation	54 545	55 137	1
Renewable generation	22 977	29 305	28
Non-Renewable generation	31 568	25 832	-18
Export balance (>0)	2 684	-2 657	-1
Consumption of pumps	-2 223	-1 582	-29
Total consumption	49 638	50 898	2.5

Source: REN data.

On the demand side, in 2018 total electricity consumption reached 50.9 TWh, with a 2.5% increase compared to 2017.

Unlike 2017, in 2018 hydrological conditions were much more favourable, with a hydrological index⁹⁶ of 1.05 (compared to 0.47 recorded in 2017), resulting in hydropower plants on the liberalised market supplying as much as 24% of electricity consumption, a figure much higher than the 13% recorded in the previous year, with the remaining renewable capacity supplying a similar quota as in 2017, and wind capacity supplying 22% of total consumption.

In turn, non-renewable thermal power plants on the liberalised market ensured a quota of 47%, lower than the 58% recorded in 2017, with 20% of their generation coming from coal-fired plants and only 26% coming from natural gas power plants.

2018 was the third year in a row with a net export cross-border balance of 4.82% of total generation.

The percentage breakdown of electricity generation by power source in the last 5 years is presented in Table 3-14.

⁹⁶ Indicator quantifying the imbalance of the total value of hydropower produced during a given period, in comparison with what would be produced under average hydrological conditions.

Table 3-14 - Breakdown of generation, 2017 and 2018

	2017	2018
Renewable Generation	42%	53%
Hydro	13%	24%
Wind	22%	22%
Biomass	5%	5%
Solar	2%	2%
Non Renewable Generation	58%	47%
Coal	25%	20%
Natural Gas	32%	26%
Other	1%	1%

Source: REN data.

Peak demand reached its maximum value on 7 February 2018, reaching a figure of 8,794 MW which, compared to the 2017 peak, shows a small increase of 23 MW (0.26%), continuing the 2017 upward trend.

Table 3-15 - Day of annual peak demand, 2014 to 2018

Year	Day	Peak (MW)	Variation (%)
2014	04/feb	8 313	-0.11
2015	07/jan	8 618	3.67
2016	17/feb	8 141	-5.53
2017	19/jan	8 771	7.74
2018	7/feb	8 794	0.26

Source: REN data

The evolution of installed capacity at the end of each year is shown in Table 3-16.

Table 3-16 - Power generation capacity, 2017 and 2018

	2017 (MW)	2018 (MW)	Change (MW)
Renewable power plants	13 397	13 552	155
Hydro	7 193	7 215	22
Wind	5 090	5 150	60
Biomass	624	628	4
CHP	351	356	5
Solar	490	559	69
Non-Renewable power plants	6 403	6 401	-2
Coal	1 756	1 756	0
Natural gas	4 607	4 609	2
CHP	778	779	1
Other	40	36	-4
CHP	27	23	-4
TOTAL	19 800	19 953	153

Source: REN data

In 2018, the main RNT developments that took place to ensure security of supply were:

- The reinforcement of transformation capacity at Zêzere Substation (220/150kV) and at Tábua Substation (220/60kV), necessary to improve the supply to local distribution networks.
- Upgrade of assets that reached their expected lifetime, including the refurbishment of existing 220 kV lines: Carregado-Rio Maior 1 and Agueira-Pereiros 1, and performing of other works on the existing 220 kV lines of Armamar-Carrapatelo 1/2 and Valdigem–Carrapatelo 1, in order to improve resilience in case of severe storms and other unforeseen atmospheric causes.
- Refurbishment of protective, control and automative systems installed at substations Batalha Zêzere, Riba d’Ave, Canelas, Santarém and Carriche.

In terms of quality of supply, the transmission network recorded an Equivalent Interruption Time (EIT) of 0.86 minutes (see section 3.1.1.2).

3.3.2 MONITORING INVESTMENTS IN GENERATION CAPACITY

In 2018, there were no developments concerning new investments in thermal generation capacity. In addition, it is expected that generation units under power purchase agreements (PPA), Pego and Tapada do Outeiro, as well as Sines will be kept in operation, regardless of having reached their contractual lifetime

limit. This expectation is supported by the Report on Monitoring Security of Supply in the National Electricity System for the period from 2019 to 2040 (RMSA-E 2018), recently approved by the Government.

In terms of hydroelectric generation capacity, unlike 2017, there were no developments in 2018 with the entry into operation of 22 MW. Within the scope of the implementation until 2030 of the PNBEPH, and of its 2016 review which added a series of new plants to the plan, some of which already commissioned, the RMSA-E 2018 confirmed 2023 as the expected commission date for the 3 units of Alto Tâmega (Gouvães, Daivões e Alto Tâmega) with an additional of 1200 MW (880 MW reversible).

The new RMSA-E 2018 also confirms the 3-year postponement until 2026 of Fridão (238 MW) and the commissioning date of the unit Carvão-Ribeira (555 MW) expected in 2030.

In terms of other generation technologies, we highlight an increase of 60 MW in wind capacity and 69 MW in solar capacity, highlighting the new unit of OURIKA with 41 MW, becoming the biggest solar unit in Portugal.

With regard to forecast of installed capacity from renewable energy sources, according to RMSA-E 2018 those included in the National Action Plan for Renewable Energies (PNAER) continue to be adopted⁹⁷, according to the information available as of 30 June 2018 regarding licensing procedures as well as the scenarios being studied in the context of the National Energy and Climate Plan (PNEC) for 2030. Table 3-17 shows the expected evolution for installed capacity of renewables energy sources.

Table 3-17 – Evolution forecast for renewable energies 2021, 2025 and 2030

	2021	2025	2030
	(MW)	(MW)	(MW)
Hydro (< 30 MW)	609	619	859
Hydro (> 30 MW)	7 382	7 542	8 335
Wind	5 382	5 693	5 812
Solar	1 684	2 923	4 973
Biomass / Biogas	931	937	937
Urban Residues	77	77	77

Source: RMSA-E 2018 data

⁹⁷ PNAER 2020: Part II of the Resolution of the Council of Ministers n.º 20/2013, published in the official Portuguese Gazette, Series I of 10 April.

3.3.3 MEASURES TO MITIGATE PEAKS IN DEMAND OR DISRUPTIONS IN SUPPLY

With regard to security of supply in the electricity sector, during 2018, there were no incidents which resulted in the need to implement measures aimed at guaranteeing the coverage of peak demand or supplier shortfalls.

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 infrastructures of the National Natural Gas System (SNGN), are established in the Infrastructure Operation Regulation (ROI) approved by ERSE. The detailed rules and procedures are provided in the Procedures Manual for Global Technical Management of the System (MPGTG), approved by ERSE. The latest revision of the MPGTG took place in 2016.

The rules applied to balancing of the SNGN infrastructure, including the transmission network compensation framework, were substantially revised in 2016, largely motivated by the publication of Commission Regulation (EU) n^o 312/2014, of 26 March, establishing a Network Code on Gas Balancing of Transmission Networks and also Commission Regulation (EU) n.º 2015/703, of 30 April, establishing a Network Code on interoperability and data exchange rules.

In 2017, the new model for the compensation of the transmission network was consolidated, in particular new procedures for (i) the submission, validation and confirmation of nominations, renominations and trading notifications; (ii) the residual balancing activity to be performed by the technical manager of the system, including the balancing actions and their merit order; (iii) the linepack flexibility service; (iv) the allocation of daily gas flows in the system's relevant points and individual gas inventories determination in the transmission network, in the storage facilities and in the LNG terminal, including the determination of daily imbalance charges; (v) the overall determination of the balancing cost and application of neutrality principles; and (vi) the model for provision of information between the technical manager of the system and the system's infrastructure users.

During 2017, according to Regulation (EU) n^o 312/2014 of 26 March, implementation began of the forecasting party (ERP) of the non-daily metered customers. The technical manager of the system was assigned as the forecasting party, counting with the cooperation of the distribution system operators.

Although the implementation of functional procedures has been successful, the full implementation of the balancing model requires the entry into operation of the Portuguese trading platform, assigned to the entity MIBGAS, S.A. Indeed, the implementation of MIBGAS has suffered some delays, pending the formal establishment of an intergovernmental agreement between Portugal and Spain.

During 2018, the daily imbalance charges were still determined based on the MIBGAS prices of the Spanish platform, affected by the Portugal-Spain interconnection tariffs. On the other hand, the balancing actions carried out by the technical manager of the system were based exclusively on balancing services, covered by a regulatory framework published alongside the MPGTG in October 2016.

The balancing services implemented in the SNGN take the form of discrete auctions, triggered by the technical manager of the system, implemented by OMIP. The auctions are open to all active market agents in Portugal. Purchase or sale of natural gas for balancing services resets the linepack inventory of the transmission network, which allows a reasonable timeframe between the occurrence of an aggregate imbalance in the transmission network and the ultimate need to purchase or sell gas to maintain the network within its operating limits. In 2018, the technical manager of the system made no sales and purchased a total of 18 GWh (3 auctions that took place on 26 July, 13 September and 20 September) to perform the residual balance of the transmission network.

4.1.1.2 ACCESS TO STORAGE INFRASTRUCTURE, LINEPACK AND ANCILLARY SERVICES

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

Access to Sines LNG terminal and to the natural gas underground storage of Carriço complies with the provisions of the Regulation on Access to Networks, Interconnections and Infrastructures (RARII), and to the Procedures Manual 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.

As of 1 October 2016, with the revision of the balancing model of the RNTGN, the management of the market agent's balancing portfolios (difference between injections and extractions of natural gas in RNTGN) ceased to benefit from individual tolerances. However, the MPGTG established that access to the linepack

(or network storage) is maintained in the form of a contracted service provided by the technical manager of the system.

At the start of the new balancing model, the way of assigning the linepack capacity by the market agents subscribing to the flexibility service was maintained, at no additional cost, until the delivery of the gas quantities allocated to the operational reserve and the acquisition of operation gas by the transmission system operator. The delay in the start-up of MIBGAS meant that, during 2018, there was no acquisition of gas from the TSO and, as a result, no operational gas stocks were bought and the so-called operational reserve stocks were not returned to the market agents. Consequently, the linepack flexibility service was in place in 2018 with no additional costs for market agents, besides the respective quantities of gas already mobilised in the transmission network.

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

ERSE continued to monitor the access conditions to the infrastructure that provide storage services, noting that there was no refusal of third-party access (TPA) in 2018. Additionally, there were no situations of congestion in as regards storage capacity.

4.1.1.3 CONNECTIONS TO NETWORKS

The regulatory framework for the commercial conditions governing connections to the natural gas network is set out in the natural gas Commercial Relations Code (RRC), approved by ERSE, which remaining unchanged during 2018.

Therefore, the regulatory framework includes, among others, aspects such as mandatory third party access, 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.

The transmission network operator is required to provide a network connection to whoever requests it in accordance with the approved commercial conditions. Distribution network operators are subject to a connection requirement only for customer installations with a minimum annual consumption of 10,000 m³ (n), as well as installations located within the area of influence of the respective network,

defined as the geographic area in the proximity of the existing network. The boundary is defined by ERSE (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, for facilities with a minimum annual consumption of 10,000 m³ (n), requesters 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.

Generically, networks are paid by natural gas consumers in the following manner:

- Network connection charges according to the rules approved by ERSE
- Tarif for use of the network, which form part of the natural gas bill. Network connection charges are considered when setting the use of the network tariffs

Commercial conditions include incentives that provide economic signals related to the cost of connecting to the network, promote an efficient resource allocation and are based on simple and easy to implement rules, in order to ensure that consumers understand it and to reduce conflicts within the sector.

Regulation codes require that network operators send information to ERSE, on a half-yearly basis, on the number of connections established, network connection charges payed 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.

4.1.1.4 TECHNICAL QUALITY OF SUPPLY

The RQS for the natural gas sector sets out the provisions on technical quality of supply. The technical component covers the following areas: continuity of supply and characteristics of natural gas supply (i.e. natural gas characteristics and supply pressure). The scope of application of the RQS covers customers, suppliers and operators of the sector's infrastructure⁹⁸.

⁹⁸ I.e. distribution network operators, transmission network operator, underground storage operator and LNG reception, storage and regasification terminal operator.

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 2018, the most significant aspects in terms of the performance of the LNG terminal were the following:

- The terminal supplied 6062 LNG tanker trucks (a slight increase compared to the value recorded in 2017, which totalled 5277 tanker trucks);
- The number of tanker trucks experiencing a delay in loading corresponded to 10% of the total (2 p.p. above the figure recorded in the previous year). 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 45 unloading operations involving carriers (against 41 carried out in 2017);
- No delays were recorded in the unloading of carriers (same as the previous year); and
- The natural gas injection assignments for the transmission network recorded a compliance of 100%, as in previous years.

With regard to the continuity of supply associated with underground storage, it is important to assess the assignments for the extraction and injection of natural gas and the energy fulfilment of storage⁹⁹. In 2018, the compliance of the injection and extraction assignments and energy storage compliance was 100%.

The continuity of the transmission network service 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 interruption (minutes/interruption). In 2018, there were two interruptions of supply at transmission network exit points, namely: i) the first interruption was classified as accidentally controllable occurred on 22 February, caused by the inadvertent closing of the GRMS 12209 outlet valve, which lasted about 22 minutes; ii) the second interruption was classified as accidentally uncontrollable, occurred on 10 July, caused by the failure of the GRMS 1269 inlet valve, affecting the Ribatejo thermo power plant for approximately 32 minutes.

⁹⁹ I.e. the average squared error of the assigned energy extracted from and injected to the underground storage in relation to the energy that is actually extracted and injected.

In the distribution networks, as with the transmission network, performance is evaluated through indicators that consider the number and duration of interruptions. In 2018, there were no interruptions in 3 of the 11 existing distribution networks (Beiragás, Sonorgás and Paxgás) and only 0.6% of approximately 1.45 million customer installations suffered interruptions. No customer was affected by more than one interruption. Nearly 72% 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 average duration of the interruptions per customer was less than 3 minutes in all the distribution networks¹⁰⁰.

The RQS establishes that the monitoring of the characteristics of natural 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 2018, 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 2018, the pressure supplied was monitored at 340 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 natural gas to customers.

We should note that, in accordance with the RQS, ERSE publishes a quality of service report on a yearly basis¹⁰¹, to present and assess the quality of service for the activities covered by the natural gas sector.

¹⁰⁰ For more information about the development of the indicator over the last few years, please refer to:

<http://www.erse.pt/pt/gasnatural/qualidadedeservico/relatoriosdequalidadedeservico/>

¹⁰¹ Available at: <http://www.erse.pt/pt/gasnatural/qualidadedeservico/relatoriosdequalidadedeservico/>

4.1.2 TARIFFS FOR CONNECTION AND ACCESS TO INFRASTRUCTURE

REGULATORY FRAMEWORK

ERSE is responsible for approving the tariff and price calculation methodology for the natural gas sector, the types of regulation for allowed revenues, as well as the transitional tariffs of sale to end-user customers, the network and infrastructure access tariffs and the prices for regulated activities.

The network and infrastructure access tariffs in place in 2018 result from the rules approved by the 2018 gas regulatory review¹⁰². The regulatory review was motivated: (i) by the need to adapt the tariff methodologies to the EU Network Code for harmonised tariffs structures for the gas transport¹⁰³; (ii) by the introduction of the OLMC as a regulated activity; and (iii) by the adoption of the changes in the social tariff financing mechanism, advocated by the 2018 State Budget¹⁰⁴.

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

In the natural gas sector, there are several regulated activities with allowed revenues established by ERSE, which are recovered by the following tariffs: Global Use of System, Transmission Use of Network, Use of Reception Terminal, storage and LNG regasification, Use of Underground Storage, Switching Logistic Operation, 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 measuring rules are the billable elements for each tariff.

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

¹⁰² [Regulation n.º 225/2018](#), of 16 April.

¹⁰³ Approved by the [Regulation \(EU\) 2017/460 of the Commission, of 16 March](#).

¹⁰⁴ [Law n.º 114/2017, of 29 December](#), which approved the 2018 State Budget.

The tariffs for network access for each billing variable are obtained by adding the corresponding tariff 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 can know exactly how much he pays, for example, for the use of the distribution network at medium pressure (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, is of particular importance for customers with no experience in choosing a supplier and, in particular, for customers with less information.

Natural gas network and infrastructure access tariffs are due in order to access the SNGN infrastructure in question, and include the tariffs for the Global Use of the System, the Use of the Transmission Network, the Use of the Distribution Network, the Use of the LNG Reception, Storage and Regasification Terminal, the Switching Logistic Operation and the Use of Underground Storage. The networks and infrastructure access tariffs are approved by ERSE.

In 2018, ERSE launched a public consultation process¹⁰⁵ which led to the approval of a reasoned decision¹⁰⁶ on the rules for the harmonised structure of natural gas transmission tariffs, including rules on the application of a reference price methodology, consultation and disclosure requirements, as well as calculation of the normalised capacity reserve products prices.

As regards networks, access is paid for by all natural gas consumers, so network access tariffs are included in the prices paid by natural gas consumers, both in market-based prices and in transitional tariffs for end-customers. General speaking, these tariffs are paid by suppliers on behalf of their customers¹⁰⁷. As far for the Use of the LNG Reception, Storage and Regasification Terminal and for the Use of Underground Storage tariffs are concerned, these are paid by the users of this infrastructure.

¹⁰⁵ [Public Consultation n.º 66](#), on the implementation of the EU Network Code for harmonised tariffs structures for the gas transport.

¹⁰⁶ According to [Directive n.º 8/2019](#), which approves the methodology to determine the reference prices for the Use of the Transmission Network tariff.

¹⁰⁷ This tariff may be paid directly by customers benefiting from the status of market agent, which are 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 4-1 and Table 4-2 show the set of access and infrastructure tariffs and the corresponded billing variables.

Table 4-1 - Structure of the tariffs which are part of the access tariffs to natural gas networks

Network and infrastructure access tariffs	Billing variables	EHV Clients	HV Clients	MV Clients	SpLV Clients
Overall Use of the System	Energy	●	●	●	●
Use of the Transmission Network	Capacity	●			
	Energy	●	●	●	●
Use of the Distribution Network	Fixed term		●	●	●
	Capacity		○	○	
	Energy		●	●	●
Switching operation	Fixed term		●	●	●
	Capacity	●			

○ - Depends on the tariff's option

Source: ERSE data

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

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

* Applies only to the service for loading of tanker trucks with LNG

Source: ERSE data

NETWORK AND INFRASTRUCTURE ACCESS TARIFF PRICES

The 2018 access tariffs correspond to the tariffs approved for the gas year 2017-2018, in force in the first semester, and the tariffs approved for the gas year 2018-2019, in force in the 2nd semester¹⁰⁸.

For the gas year 2018-2019, the high pressure networks and infrastructures access tariffs, for the estimated demand for that year, suffered significant tariff decreases compared to 2017-2018, as showed in Table 4-3 and Table 4-4.

Table 4-3 – Tariff evolution for high-pressure infrastructure, the use of networks and the global use of the system for the gas year 2018-2019, by activity

Tariffs per activity	Average price 2017-2018 (EUR/MWh)*	Average price 2018-2019 (EUR/MWh)	Change
Use of the LNG Terminal (Sines)	1.66	0.88	-46.7%
Use of the Underground Storage	12.13	8.12	-33.0%
Use of the Transmission Network	1.92	1.57	-18.3%
Use of the Distribution Network	9.17	8.37	-8.8%
Global Use of the System	0.51	0.08	-84.9%

* Application of 2017-2018 tariffs to the demand forecasted for 2018-2019.

Source: ERSE data

¹⁰⁸ The natural gas network and infrastructures tariffs in force from July 2017 are available at http://www.erse.pt/pt/legislacao/Legislacao/Attachments/1997/Tarifas_GN_2107-2018.pdf and the ones in force from July 2018 are available at: http://www.erse.pt/pt/gasnatural/tarifaseprecos/2018_2019/Documents/PagPrincipal/DIR_9_2018_TarifasGN.pdf.

Table 4-4 – Tariff evolution for network access for the gas year 2018-2019, by type of client at each pressure level

Network access tariffs per pressure level	Average price 2017-2018 (EUR/MWh)*	Average price 2018-2019 (EUR/MWh)	Change
Power Plants	2.67	1.84	-31.1%
HP Customers	1.66	0.91	-45.1%
MP Customers	3.66	3.07	-16.3%
LP Customers with an annual consumption above 10,000 m ³	15.05	13.84	-8.1%
LP Customers with an annual consumption lower than or equal to 10,000 m ³	32.51	32.30	-0.6%

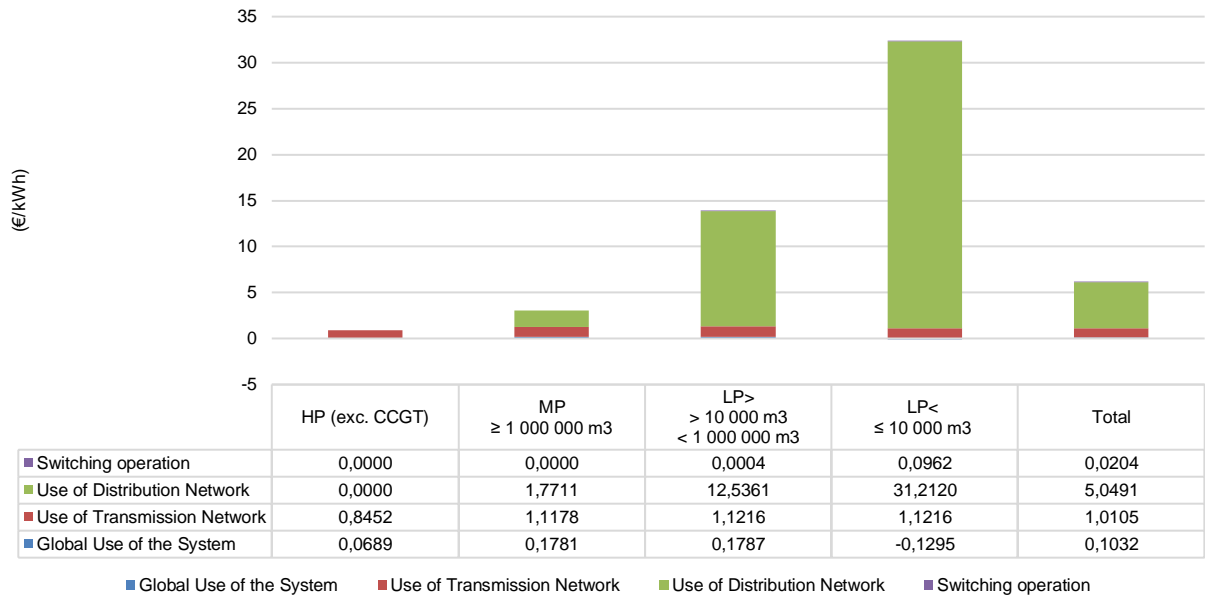
* Application of 2017-2018 tariffs to the demand forecasted for 2018-2019.

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

The tariffs variations presented are the result of several factors taken together, among which we note the decrease of the revenues to be recovered by the network access tariffs. This fact is based on: (i) higher consumption by natural gas combined cycle power plants in 2016 and 2017, which led to an increase of historically high levels of the natural gas demand at the large high pressure infrastructure; (ii) the decrease in investment costs, in the face of the coming together of a decrease in the rate of return established by ERSE and a better adaptation of the level of investment to the level of demand; and (iii) the decrease in allowed revenues for the regulated companies due to the efficiency targets that are applied to them.

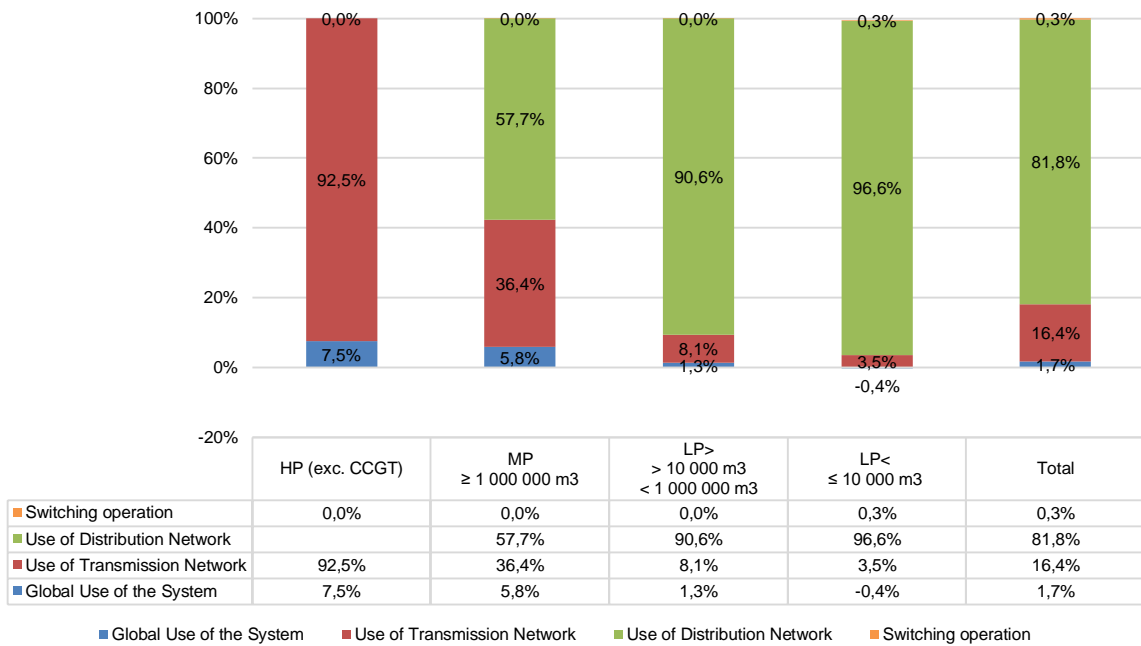
The following figures show the disaggregation and the structure of the average price of network access tariffs by the various tariffs which compose them, for each pressure level. The average price of the high pressure access tariff does not include power plants.

Figure 4-1 – Breakdown of the average price of network access tariffs, in the tariff year 2018-2019



Source: ERSE data

Figure 4-2 - Structure of the average price of network access tariffs, in the tariff year 2017-2018



Source: ERSE data

REGULATION METHODOLOGIES FOR DETERMINING ALLOWED REVENUES

2018 was the last year of the 2016-2017 to 2018-2019 regulatory period. Towards the end of the year ERSE initiated the procedures to prepare the new regulatory period and regulatory changes, whose public consultation was initiated in the beginning of 2019.

The regulatory models for the regulatory period in force are set out below for each activity:

- Reception, Storage and Regasification of LNG: application of a price cap¹⁰⁹ methodology for operational costs (OPEX) and of a rate of return methodology with a 10-year capital cost-flattening mechanism (ending in the 2016-2017 gas year) for CAPEX; application of a mechanism to ease tariff adjustments that recognises positive externalities for the entire SNGN associated with this activity.
- Subterranean Storage: price cap¹¹⁰ methodology for OPEX regulation and rate of return methodology for CAPEX; application of a mechanism to ease adjustments to authorised revenues, as in the Reception, Storage and Regasification of LNG.
- Natural Gas Transmission: this activity follows a regulation based on incentives for OPEX, using i) a price cap methodology with one portion that is not indexed to the evolution of physical variables and one portion indexed to the evolution of the maximum capacity used in outlets variable; ii) a rate of return methodology for CAPEX; and iii) a mechanism implemented for the regulatory period in force that aims at mitigating the effects associated with the volatility of demand in terms of authorised revenues recoverable via the application of the tariffs.
- Global Technical System Management: introduction of a change in the methodology used for regulating this activity, replacing an accepted costs model with an incentive-based model. this activity thus follows a rate of return methodology for CAPEX, and a revenue cap methodology for the OPEX portion composed of intragroup costs.

¹⁰⁹ The cost driver that determines the evolution of revenue recoverable by application of the respective tariff is re-gasified energy.

¹¹⁰ The cost driver that determines the evolution of revenue recoverable by application of the respective tariff is extracted/injected energy.

- Natural Gas Distribution: price cap¹¹¹ methodology for OPEX and rate of return methodology for CAPEX; a mechanism to recover authorised revenues associated with the evolution of demand, similar to the one used in Natural Gas Transmission, was also implemented;
- Suppliers of Last Resort: price cap¹¹² 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 natural gas sector, for the first time, reference costs were set for the retail market.

The annual efficiency factors applied to OPEX varied between (i) 2% in the reception, storage and regasification of LNG; (ii) 3% in transmission; (iii) 2% in Global Technical System Management; (iv) 3% in underground storage; (v) 2% and 7%, per company, in distribution; and (vi) 2% for all suppliers of last resort.

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 equity and other risks¹¹³. 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.

DISPUTED TARIFF RULINGS

In terms of appeals to a ruling or methodology used by the regulating entity, as provided for in Article 41(1) of Directive 2009/73/EC, it should be noted that the natural gas distribution network concessionaires have brought lawsuits against ERSE, challenging the approval of tariffs for use of the networks relating to the period between 1 July 2010 and 30 June 2018. These lawsuits were duly challenged and are currently under review and trial in the competent administrative court, with no ruling having been handed down thus far.

Also noteworthy is the lawsuit filed by EEM (Empresa de Eletricidade da Madeira S.A.) against ERSE to recognise the right to include in the tariff calculation the costs of municipal right-of-way rates between 2006 and 2015. This lawsuit was challenged in 2018 and there has been no decision so far.

¹¹¹ The cost drivers that determine the evolution of revenue recoverable by application of the respective tariff are distributed energy and supply points.

¹¹² The cost driver that determines the evolution of revenue recoverable by application of the respective tariff is average number of customers.

¹¹³ For 2018, the asset remuneration rates were the following: high-pressure activities - 5.52%; distribution activities – 6.20%.

Additionally, EDP Serviço Universal, S.A. filed an action against ERSE in order to declare nul or have annulled the ERSE administrative act that determines the “Allowed Revenues and Adjustments for 2018 Regulated Companies in the sector”, in the part that fixes the adjustment related to “Celticerâmica”, a cogeneration company. This lawsuit was challenged and there has been no decision so far.

NETWORK CONNECTION COSTS

The connection of a facility to the natural gas network creates costs that depend on the type of the facility to be connected, the network itself, the pressure level, the distance, technical requirements, route, etc.

The natural gas RRC sets out the regulatory framework that applies to network connection, including charges, as described in section 4.1.1.3. One of the main elements of this framework is the determination of the costs that petitioners have to meet, bearing in mind that the difference between total investment costs and costs met by petitioners is paid by consumers through use of the network tariffs.

4.1.3 CROSS-BORDER ISSUES

The mechanisms for capacity allocation and congestion management in the SNGN infrastructure are established in accordance with the principles laid down in the RARII, which is approved by ERSE.

The RARII integrates the principles laid down in 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 and in 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 and repealing Regulation (EC) No 1775/2005. RARII establishes the possibility of allocating capacity for horizons longer than the so-called "capacity allocation year", which runs between 1 October to 30 September of the following year. The detailed rules and procedures concerning capacity allocation, congestion management and capacity determination in SNGN infrastructure are established in the Procedures Manual for Infrastructure Access (MPAI), which is approved by ERSE.

With regard to capacity allocation and congestion management mechanisms at the Virtual Interconnection Point (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; and (iii) the implementation of an oversubscription and buy-back mechanism to bundled capacity products, safeguarding compliance with Commission Decision 2012/490/EU, of 24 August 2012, on 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 MPAI foresees the future implementation of MIBGAS, in particular, the implementation of an implicit mechanism for the allocation of capacity at the VIP, provided for in Article 50 of the RARII. Thus, a new mechanism for capacity set-aside was established for the VIP, allowing implicit capacity allocation with the natural gas transactions in MIBGAS, as well as the procedures associated with this assignment methodology.

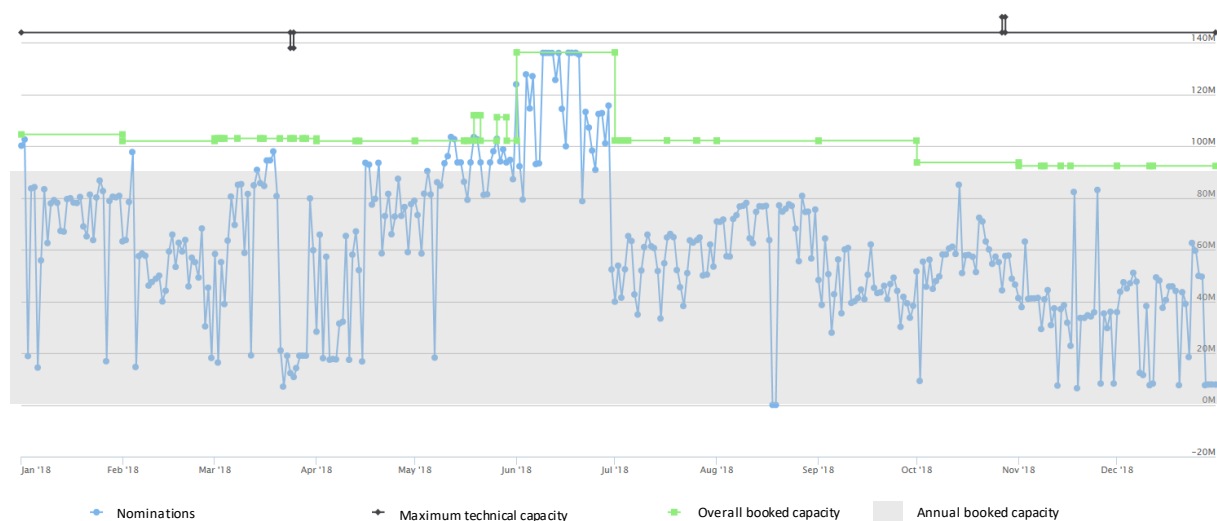
During 2018, no capacity was allocated under the new implicit capacity allocation mechanism in the VIP, due to the postponement of the start-up of the MIBGAS (Portuguese platform). Thus, the rules for capacity allocation in the VIP, in 2017, were based exclusively on the European Network Code on capacity allocation mechanisms in gas transmission systems, which is mandatory in all Member States. The platform adopted for this purpose was PRISMA, as is the case for most of the natural gas interconnections in the EU space.

Regarding the application of the mechanisms to solve congestion, the implementation of the harmonised methodology of overbooking in the Iberian VIP resulted in the availability of overcapacity of 47 days of 2018.

ACCESS TO INTERCONNECTIONS

Access to interconnections occurred through annual, quarterly, monthly, daily and intraday auctions, carried out on the PRISMA platform. A significant part of the capacity is contracted long-term in Spain, so that the bundled products only cover the remaining part of the available capacity.

In 2018, there were no situations where demand for capacity in the VIP exceeded supply. The following figure shows the capacity in 2018, attributed in the PRISMA platform and reserved in long-term contracts, comparing the contracted capacity with the nominations submitted by market agents and the maximum technical capacity in the VIP.

Figure 4-3 – Booked capacity *versus* nominations/renominations, year 2018

Source: ENTSOG

The previous figure highlights the high contribution of products of annual maturity in total contracted capacity, mainly through long-term contracts.

COOPERATION

The Portuguese and Spanish transmission network operators have been cooperating closely with each other to improve the inter-operability 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) n.º 2015/703 of 30 April 2015.

The respective regulatory authorities (CNMC and ERSE) have been taking steps to gradually eliminate the cross-border tariffs. Additionally, ERSE and CNMC continued to work on possible models for integrating the Iberian natural gas market, provided for in the work plan of the Southern Regional Gas Initiative.

MONITORING OF INVESTMENTS MADE BY THE NATURAL GAS INFRASTRUCTURE OPERATORS

National Development and Investment Plan for the Natural Gas Transmission Network

After the launch of a public consultation on the proposal submitted by REN Gasodutos to DGEG, for the RNTIAT Development and Investment Plan for the period from 2018 to 2027 (PDIRGN 2017), ERSE issued

on 13 April 2018 its opinion, considering that the RNTGN operator had created conditions to facilitate the approval of the PDIRGN 2017's proposal by the Government, following the audition by the Assembleia da República that was legally established. The PDIRGN 2017 was approved by the Government on 19 December 2018.

In the follow-up process of the 3rd PCI list led by the European Commission and in which ACER participated together with the NRA, several activities were carried out, in particular the consistency check between the Ten-Year Network Development Plan from ENTSOG and the PDIRGN 2017 as well as the monitoring of the implementation of the projects of the 3rd PCI list, namely the third interconnection Portugal-Spain (1st phase and 2nd phase).

National Development and Investment Plan for the Natural Gas Distribution Networks

The 11 natural gas distribution system operators¹¹⁴ submitted to DGEG their proposals for the Distribution Network Development and Investment Plans for the period 2019-2023 (PDIRD-GN 2018).

In turn, after requesting changes from the various distribution system operators, DGEG sent to ERSE the proposals, and ERSE conducted a public consultation of their contents which began on 10 December 2018.

In this public consultation, ERSE pointed out that, although the proposals for PDIRD-GN 2018, presented a significant improvement in quality, fulfilling most of ERSE's previous recommendations, namely in terms of information and evidence of investment selection criteria, the rationale for drafting the proposals hardly addressed the energy transition prospects foreseen in the PNEC 2030, concerning the future of the natural gas sector and its possible consequences for distribution networks.

¹¹⁴ Setgás, Lisboaagás, Lusitaniagás, Beiragás, Medigás, Dianagás, Duriensegás, Paxgás, REN Portgás Distribuição, Sonorgás e Tagusgás.

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

Currently, there is no reference for price formation based on an organised or regulated market for the natural gas wholesale market in Portugal. The start of spot product trading with delivery in Spain, in December 2015, on the platform managed by MIBGAS S.A. (the entity authorised by the Portuguese government through Order n.º 643/2015 to manage the organised gas spot market), did not change the situation. In fact, the beginning of trading through MIBGAS with delivery in the Portuguese area is still pending specific regulation, and the trading volumes recorded in the organised market with delivery in Spain were rather low.

On the other hand, Portugal is not a natural gas producer, so 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), by means of long-term contracts.

The supply of natural gas through the interconnections is essentially based on the contract between Sonatrach and the Galp group (representing 34% of the import balance in 2018), which includes obligations to purchase and the payment of quantities consumed or not (take or pay clause). This contract assumes the existence of annual supplies of around 2.5 bcm¹¹⁵ for the duration of the contract, i.e. until 2020.

Supply through the LNG terminal is essentially based on LNG agreements with Nigeria that also include a take or pay clause. This contract follows price rules defined in contracts, and envisages an annual volume of approximately 3.42 bcm.

In 2018, nearly 62% of the natural gas was supplied through LNG.

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,

¹¹⁵ Billion cubic meters

Norway, Libya and Equatorial Guinea, among 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) n.º 1348/2014 of 17 December, on data reporting implementing Article 8(2) and Article 8(6) of the REMIT.

Despite the fact that the Iberian natural gas hub, MIBGAS, began operating in December 2015, with the trading of spot products delivered in Spain, there is still no schedule for the start of spot trading with delivery in Portugal; this makes it difficult to define reference prices and trading market records for both the spot market and the forward market, and is an added difficulty in the task of providing the natural gas market with more information and transparency.

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 transmission network operator and contracts negotiated outside the organised market platforms began on 7 April 2016 across the entire European Union, in accordance with the schedule laid down in Article 12 of the Commission Implementing Regulation (EU) n.º 1348/2014 of 17 December, on data reporting implementing Article 8(2) and Article 8(6) of the REMIT, 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.

The 2016 regulatory review of the natural gas sector incorporated specificities related to the application of REMIT.

NATURAL GAS SUPPLY

As Portugal does not have its own production, the main countries supplying natural gas are Algeria and Nigeria. This is done mainly through long-term take or pay contracts. The breakdown of supply is described in Figure 4-4 .

Between 2013 and 2016, there was a lower importance of the terminal compared to the use of the interconnections, both at the entrance to Campo Maior as well as to Valença.

In 2017 and 2018, the Sines Terminal was the main supply route, accounting for approximately 55% and 62% of the total contracted gas.

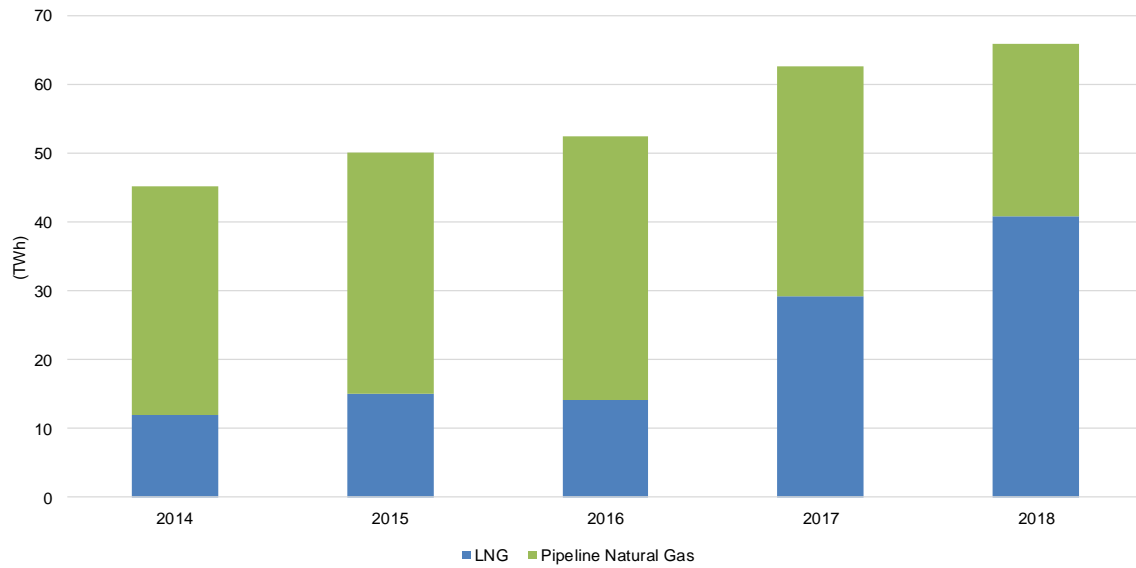
Figure 4-4 – Breakdown of natural gas supply by infrastructure, 2014 to 2018



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

Figure 4-5 shows the evolution of the volumes of the import balance of natural gas in Portugal for LNG and natural gas from the cross-border interconnection with Spain. In 2018, a total volume of 66 TWh was imported.

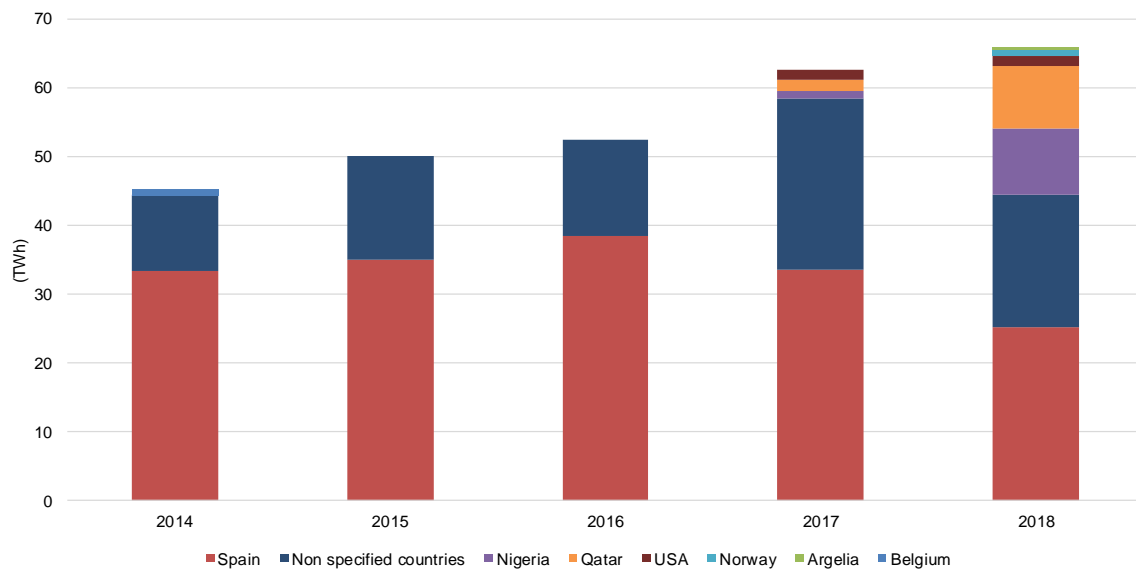
Figure 4-5 - Evolution of imported volumes of natural gas, 2014 to 2018



Source: EUROSTAT, Elaboration ERSE

Figure 4-6 shows the origin of natural gas from 2014 to 2018.

Figure 4-6 - Origin of imported natural gas, 2014 to 2018



Source: EUROSTAT, Elaboration ERSE

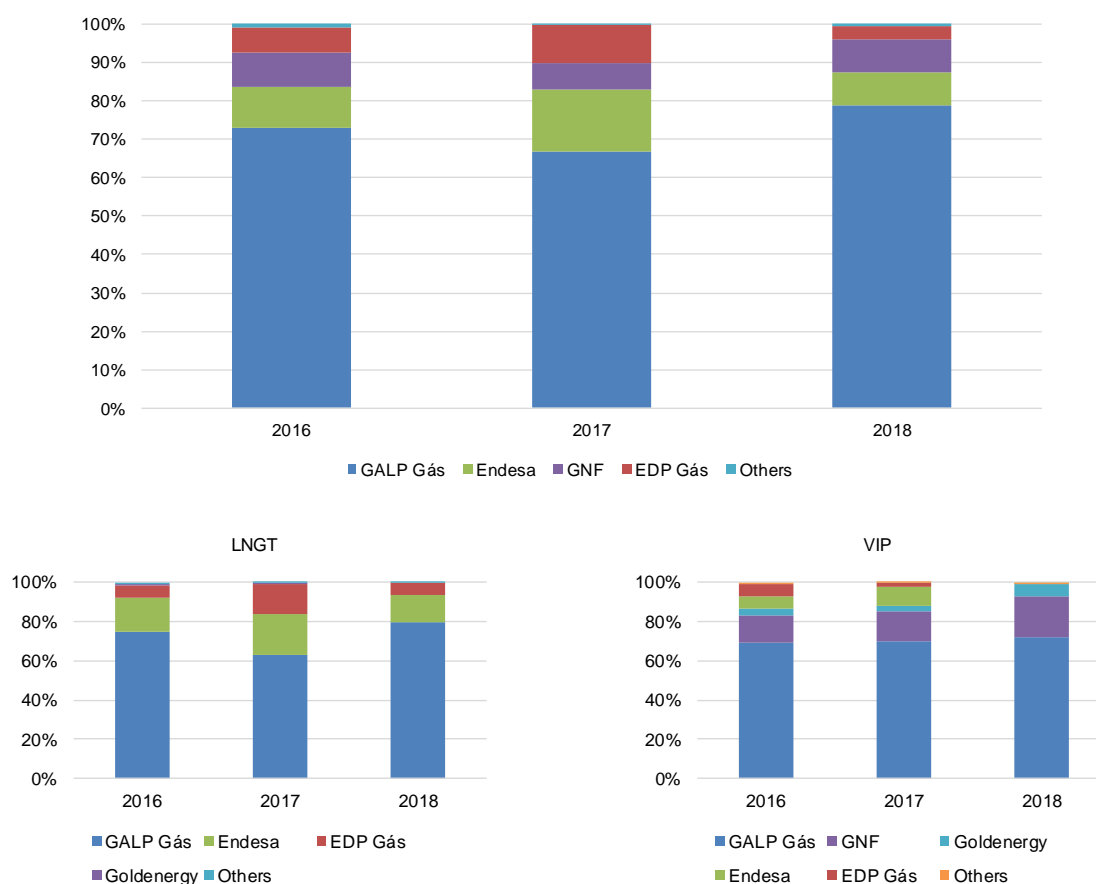
There is a strong presence from Spain, in which the volumes are associated with imports from Algeria by pipeline, relating to the Sonatrach contract. On the other hand, procurement from Nigeria refers to contracted LNG deliveries at the Sines terminal.

Regarding the remaining import volumes, they refer to the reception of LNG at the Sines terminal. In 2018, contributions from Qatar and the presence of United States of America as a source of supply are highlighted as a result of the existence of a fairly liquid natural gas market at the Henry Hub and with installed liquefaction capacity on the East Coast, which makes it possible to export natural gas by sea to the most diverse geographies of the planet. It is also important to point out the contribution of natural gas supply from unspecified countries and territories in the context of trade with third countries, due to the report made by the companies to the DGEG, reporting this to EUROSTAT, and which has gained relevance since 2014.

EFFECTIVENESS OF COMPETITION

Figure 4-7 presents the natural gas inflows in the RNTGN considering the interconnections by pipeline (VIP) and the Sines terminal (LNGT) between 2016 and 2018.

Figure 4-7 - Entries in RNTGN (LNGT+VIP), 2016 to 2018



Source: REN, Elaboration ERSE

Regarding the companies responsible for national supply, and when the total entries in the RNTGN are observed, we see that Galp accounts for almost 80% of the entries, which increased between 2016 and 2018.

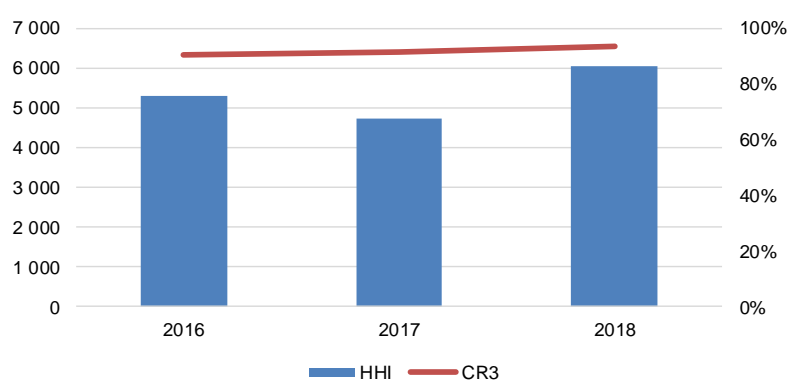
In 2018, market agents Gas Natural Fenosa (GNF), through imports in the VIP, and Endesa, from the terminal, both emerge in second place for imports. The decrease in imports by Endesa between 2017 and 2018 was due to a smaller use of Pego's CCGT¹¹⁶.

The EDP group appears as the fourth market agent responsible for natural gas entries into the RNTGN; these have focused almost exclusively at the Sines terminal.

The reasons associated with decreases in EDP's revenues in 2018 compared to 2017 are similar to those of Endesa. Goldenergy also stands out as the third largest agent in the entrances from the VIP.

Figure 4-8 shows the concentration indexes, HHI and CR3¹¹⁷, in the RNTGN (LNGT + VIP) entries between 2016 and 2018.

Figure 4-8 – Concentration indexes in RNTGN (LNGT + VIP) entries, 2016 to 2018



Source: REN, Elaboration ERSE

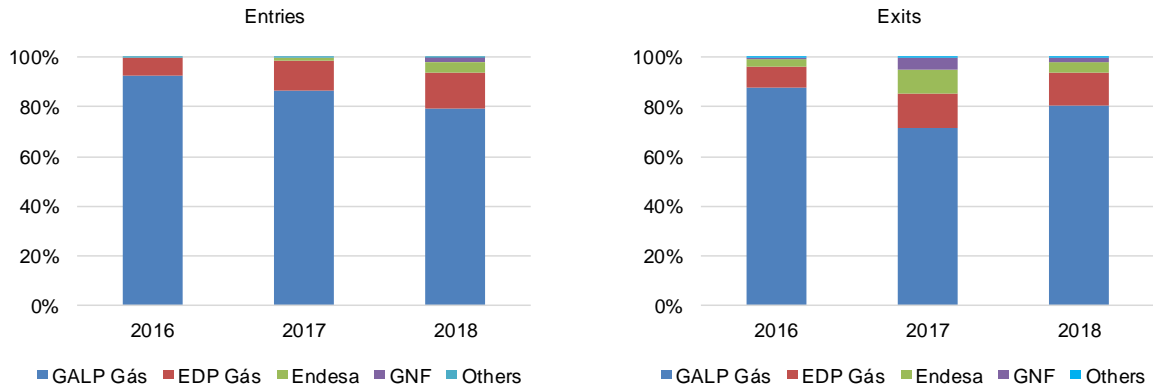
Between 2016 and 2017, there was a deterioration of concentration indices relative to the entries in the RNTGN. The lower use of CCGTs has a decisive influence on the value of RNTGN inflows by Endesa and EDP Gás, which has a decisive impact on the increase in market concentration.

¹¹⁶ Pego's CCGT (Combined Cycle Gas Turbine) produced about 4.2 TWh in 2017 and about 3 TWh in 2018.

¹¹⁷ The CR3 index refers to the market share of the three largest market agents.

Figure 4-9 shows the use of underground storage between 2016 and 2018.

Figure 4-9 – Use of underground storage, 2016 to 2018

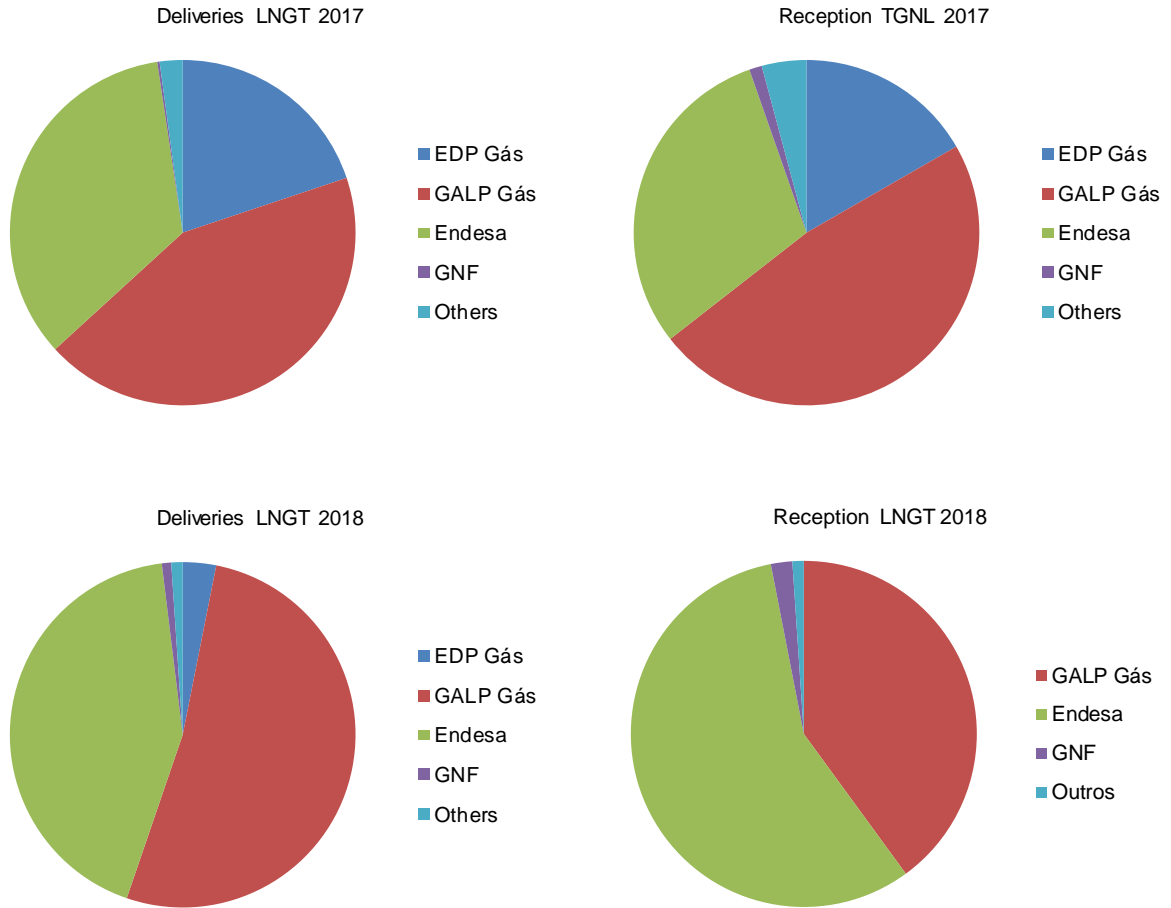


Source: REN, Elaboration ERSE

Regarding the entries and exits in the underground storage, we note greater use by EDP Gás, compared to its use profile in the other infrastructures in contrast with less use by Endesa and Gas Natural Fenosa.

Figure 4-10 shows the market shares of LNG swaps at the Sines terminal, in 2017 and 2018.

Figure 4-10 – Swaps in LNGT, 2017 and 2018

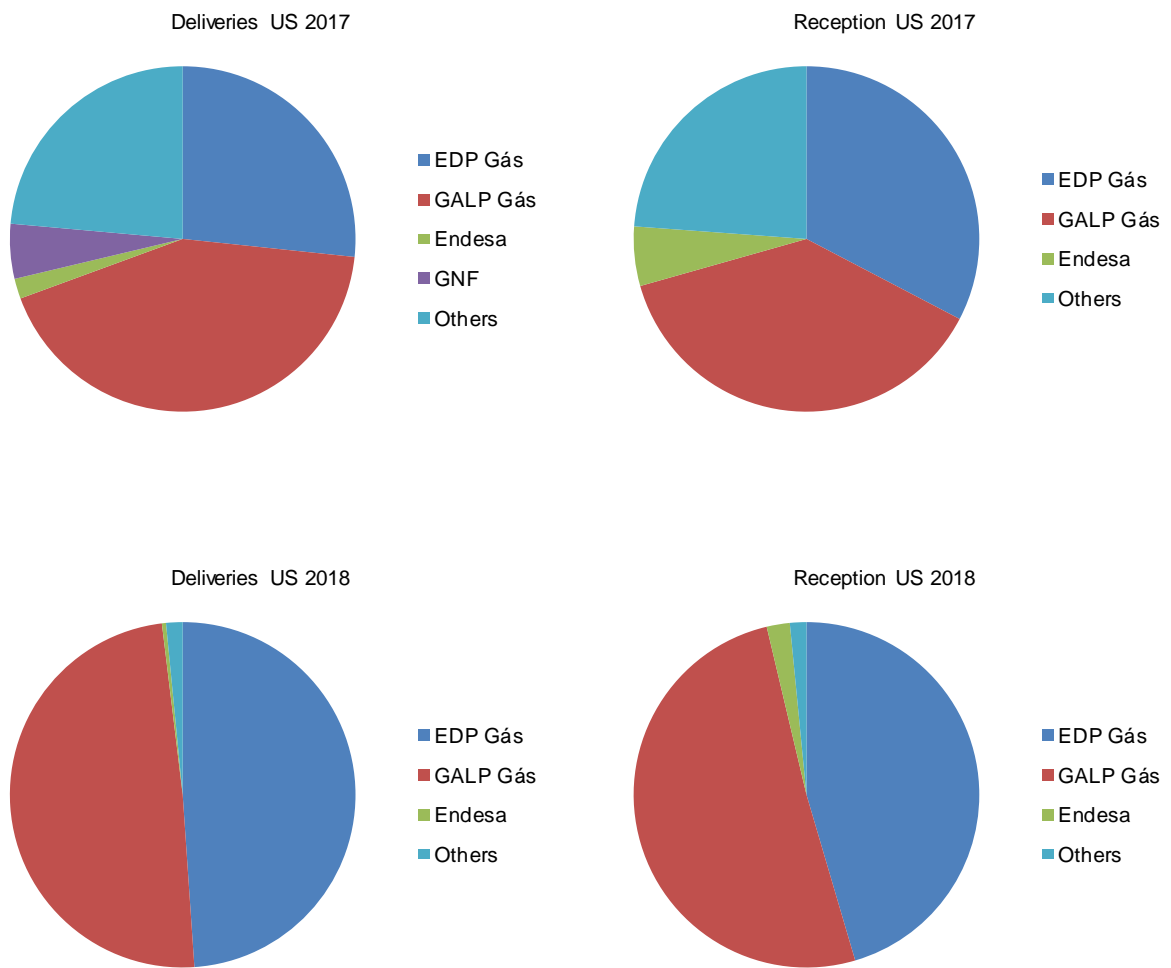


Source: REN, Elaboration ERSE

Between 2017 and 2018, it is worth mentioning the reduction in the weight of EDP Gás. In 2017, GALP Gás registers more receipts than deliveries, reversing the situation in 2018, just the opposite with ENDESA. EDP Gás always has more deliveries than entries at the LNGT. The other entities have very low values.

Figure 4-11 shows the natural gas swaps market share in underground storage (US), in 2017 and 2018.

Figure 4-11 – Swaps in US, 2017 and 2018

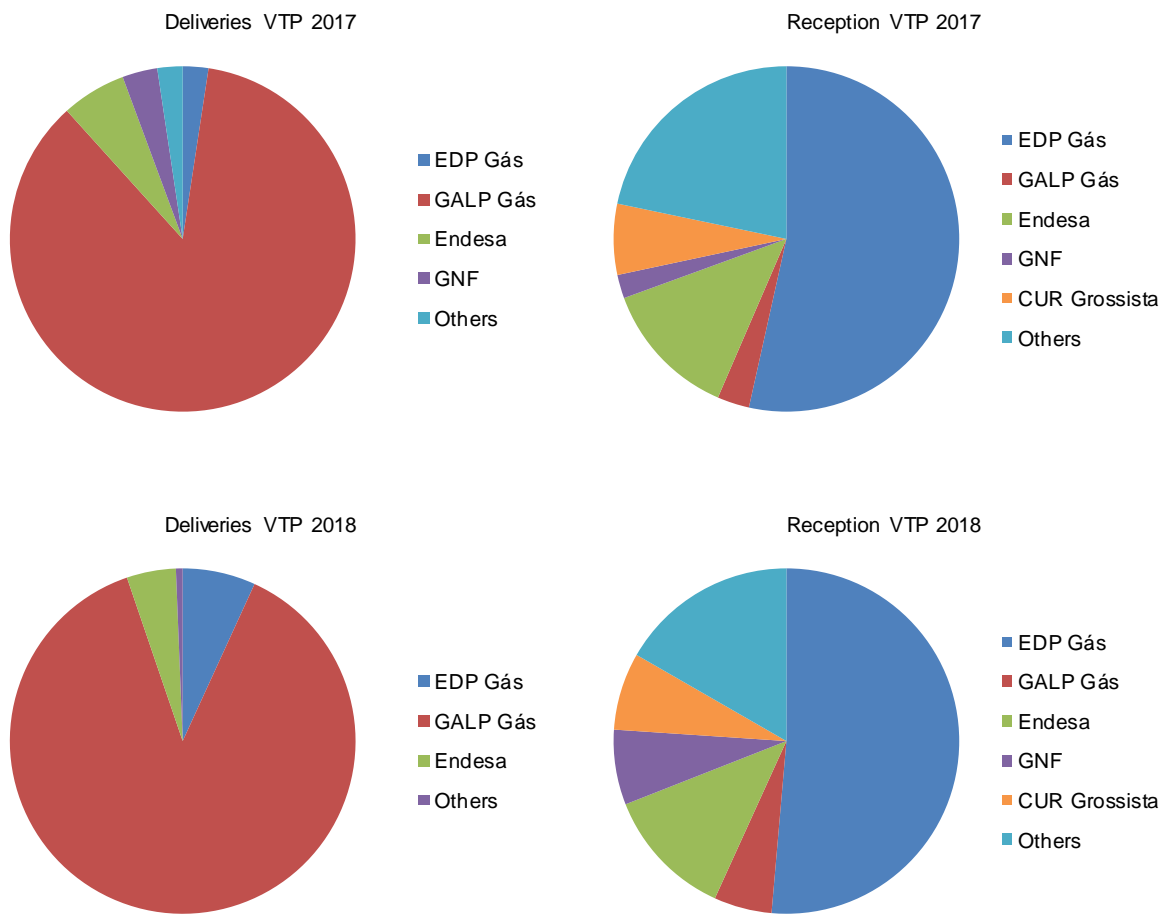


Source: REN, Elaboration ERSE

Swaps in US seem to be limited to mere intertemporal swaps since the weights recorded in deliveries are very similar to the weights recorded in the receipts.

Figure 4-12 shows the market share of natural gas swaps in the Virtual Trading Point (VTP), in 2017 and 2018.

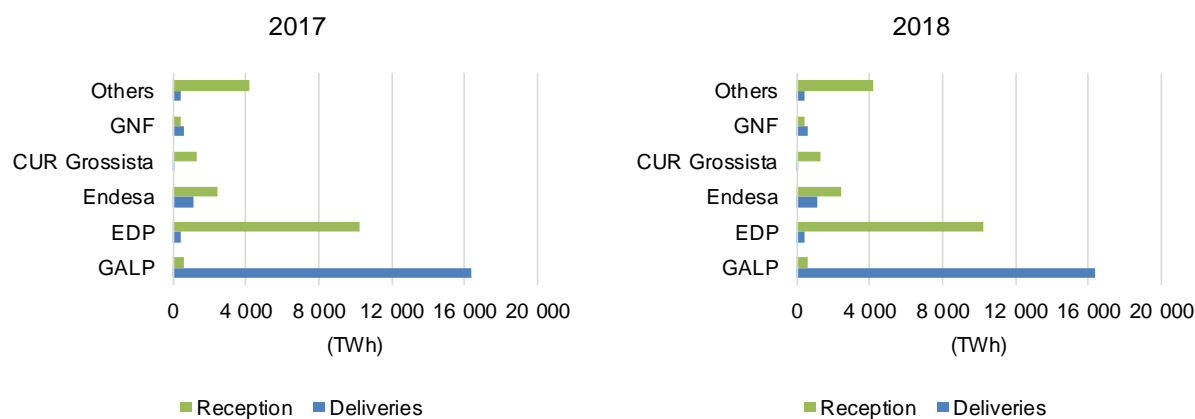
Figure 4-12 – Swaps in VTP, 2017 to 2018



Source: REN, Elaboration ERSE

Contrary to what happens in the terminal or in underground storage, where exchanges appear to be mere swaps between market agents, Figure 4-13 shows that in exchanges in the VTP, each agent takes a position clearly more as a seller or buyer, suggesting that this is the preferred point of exchange for natural gas in the SNGN.

Figure 4-13 – Exchanges (VTP)



Source: REN, Elaboration ERSE

GALP appears with sales shares in the VTP of more than 85%, and its purchase volumes are almost residual, between 3% and 5%.

On the other hand, EDP is configured as mainly a buyer market agent in the VTP, with market shares greater than 50%, while in sales it has insignificant shares, between 2% and 7%.

CEPSA is the second buyer market agent, with about 15% of purchases in VTP. This situation will change in the future, as CEPSA no longer has a trading portfolio and its consumption has been integrated into the portfolio of another supplier.

Endesa appears as mainly a buyer market agent, with shares of 12% to 13%, although it has also significant quotas on the sale side, 5% to 6%.

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 2017-2018 gas year.

NETWORK BALANCING RULES

Considering that the trading of spot products delivered in Portugal via the MIBGAS, S.A. platform is still pending specific regulation, Directive n.º 16/2016, of 27 October, was approved. It provides that until the aforementioned trading begins, the OMIP platform would be used to host auctions for the purchase or sale of natural gas in which the transmission network operator acts as sole purchaser or seller in order to balance the network.

The entry into force of the new network balancing rules supports 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 transmission network operator, affected by a slight adjustment, in accordance with the rules laid down in Regulation (EU) n.º 312/2014 of 26 March 2014. Under these conditions, network users are encouraged to balance their portfolios even if, for that purpose, they have to resort to market transactions, as that option is less expensive than maintaining the existing imbalances.

4.2.2 RETAIL MARKET

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

At the end of 2018, more than 97% of natural gas consumption within the conventional segment (excluding standard regime power plants) was being supplied by suppliers on the liberalised market.

On the liberalised market, at the end of 2018, there were 12 suppliers on the market, all of them operating in the household consumer segment.

By the end of 2018, about 212,000 consumers, from approximately 1.5 million, had switched supplier through the respective platform, most of them from the household segment.

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 prices disclosure by the suppliers, as well as the legal competence of ERSE regarding the monitoring of the natural gas market and information to consumers and other agents on prices charged, suppliers send ERSE updated information on the reference prices charged or expected to

be charged in the sale of natural gas for all Low-Pressure (LP) supply with an annual consumption lower or equal to 10 000 m³, as well as information regarding the average prices charged in the retail market¹¹⁸.

The 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).

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 are the supplier's basic sales offer, which does not prevent the application of differentiated special contractual conditions such as discounts or other promotional campaigns.

This information must be sent on an annual basis (end of July) and whenever there is any change in prices or contractual conditions. The information provided to ERSE by suppliers is included in simulation and decision-making support tools for consumers, which are further detailed in the transparency chapter, are made available by ERSE on its website¹¹⁹. These tools are complemented with the publication of quarterly newsletters about the reference market prices in LP¹²⁰.

The result of the analysis of the market offers reveals that, in December 2018, for the most representative consumer type in the household segment¹²¹, there are eight suppliers operating in the market with a total of 31 mono natural gas offers and 63 dual natural gas and electricity offers, totalling 94 commercial offers. Three of these suppliers offer additional services, like for example, technical assistance services and energy audits, and prepayment commercial offer.

In the referred period, the commercial offer with the lowest annual bill had a value of 198€/year, corresponding to a mono natural gas offer. The difference between this offer and the most expensive one is 68€/year (26%). The dual natural gas commercial offer with the lowest value of the natural gas supply

¹¹⁸ Pursuant to [Order n.º 3677/2011](#), of 24 February.

¹¹⁹ At <https://simulador.precos.erse.pt>.

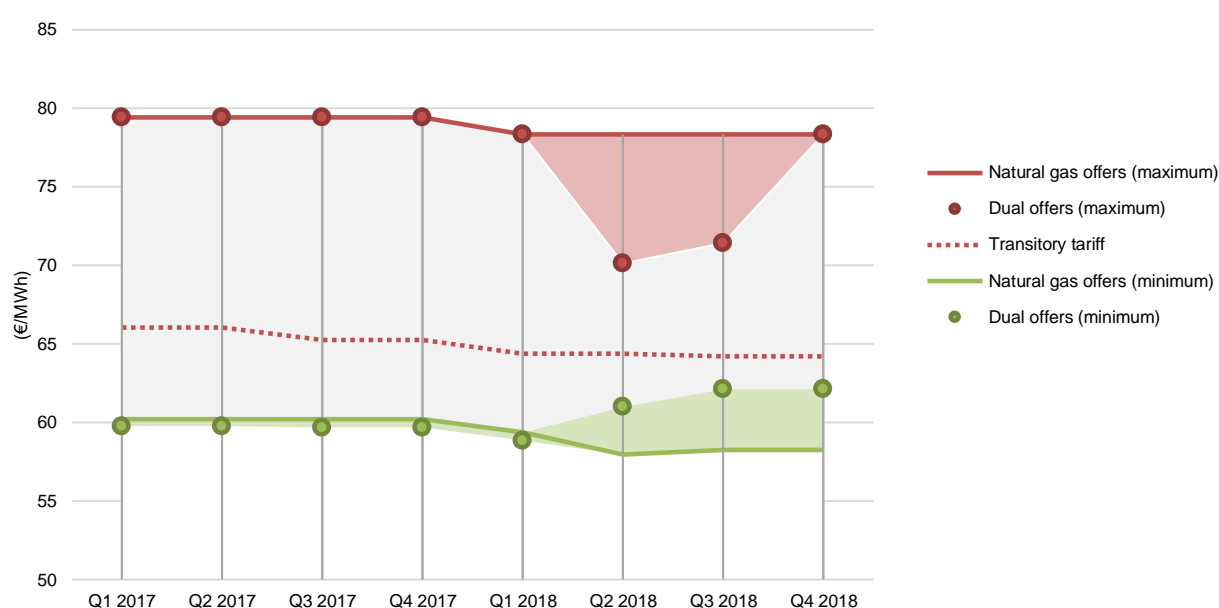
¹²⁰ Available at [Natural Gas Commercial Offers Newsletters](#).

¹²¹ Representative as regards energy units. Correspond to consumer type 2 (couple with children and no central heating with an annual natural gas consumption on 292 m³).

component amounted to 212€/year, corresponding to a discount of approximately 21% compared to the most expensive offer¹²².

Figure 4-14 shows the evolution of market offer prices, as well as transitional tariff prices, in 2017 and 2018. In 2018, the prices of commercial offers remained stable in the period, having slightly decreased when compared to 2017. Notice the coupling of the maximum prices and minimum ones in the 2nd and 3rd quarters of 2018, namely in the dual offers.

Figure 4-14 - Price of commercial offers of natural gas (mono and dual) consumer type 2 in 2017 and 2018



TRANSPARENCY

In order to provide information continuously about reference market prices to natural gas consumers, as well as IT tools which help consumers choose their supplier, ERSE continued to operate an online simulator, available on its website, which allows comparison of the market prices offered in Mainland Portugal for facilities with in LP¹²³. The price simulator allows comparison of the prices offered by all the registered suppliers operating in Mainland Portugal¹²⁴, allowing consumers to choose their natural gas supplier by comparing the prices and the commercial conditions offered by each supplier.

¹²² Real prices without levies and taxes.

¹²³ Available at <https://simulador.precos.erse.pt>

¹²⁴ At the Autonomous Regions there is no natural gas supply.

In order to guarantee the transparency of the information made available to consumers by suppliers, ERSE also checks that the suppliers publish the offers which are being practised on the market on their websites, 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 question in its simulator until the problems identified by the suppliers are overcome.

In addition to the simulator, ERSE's website also provides all the information on reference prices and other contractual conditions that support the functioning of the simulator¹²⁵, in order to guarantee access to information to all interested parties, in an editable format.

We should add that, the suppliers that intend to supply LP< customers must publicly disclose, namely on their website, public offers for the supply of natural gas, as well as the general conditions of the contracts available for these customers¹²⁶.

Rules are also in force pertaining to the information to be made available on customer invoices, namely information regarding the invoicing frequency, information regarding the costs of access tariffs, the volume of natural gas measured and energy conversion factors (from physic units, m³, to energy units, kWh)¹²⁷, and the labelling of natural gas.

The rules for access to information regarding natural gas consumption by customers are regulated by ERSE under the terms of the Measuring, Reading and Data Availability Guide [*Guia de Medição, Leitura e Disponibilização de Dados*]¹²⁸, which was revised in 2018.

COMPETITION EFFICIENCY

In terms of effective market opening, Figure 4-15 shows the part of the market (in consumption) that was being supplied by suppliers on the liberalised market in 2018. It can be seen that nearly 97% of total consumption, with the exception of power plants due to their significant volume in terms of consumption,

¹²⁵ The document is available at <https://simulador.precos.erse.pt/>.

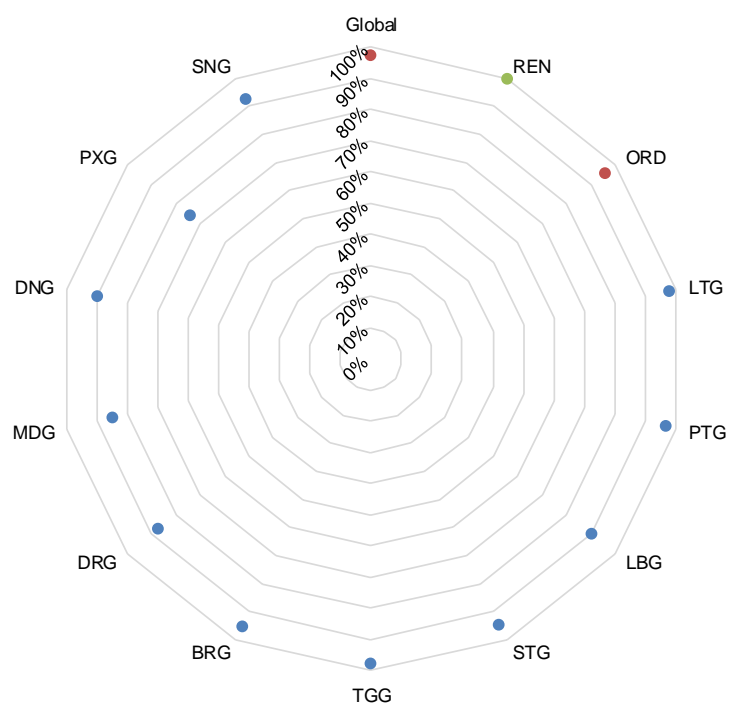
¹²⁶ Pursuant to Article 87(2) of Regulation n.º 416/2016 of 29 April, with the changes approved by Regulation n.º 224/2018, of 16 April, which approves the [Commercial Relation Code for the natural gas sector](#).

¹²⁷ Natural gas is billed per kWh, pursuant to Article 111 of the RRC for the natural gas sector.

¹²⁸ Approved by Order [Directive n.º 7/2018, de 28 de março](#).

is provided by market suppliers, and this value is generally higher among the leading natural gas distributors.

Figure 4-15 – Liberalised market penetration by DSO and TSO (total energy consumption, excluding electricity-generating plants), 2018

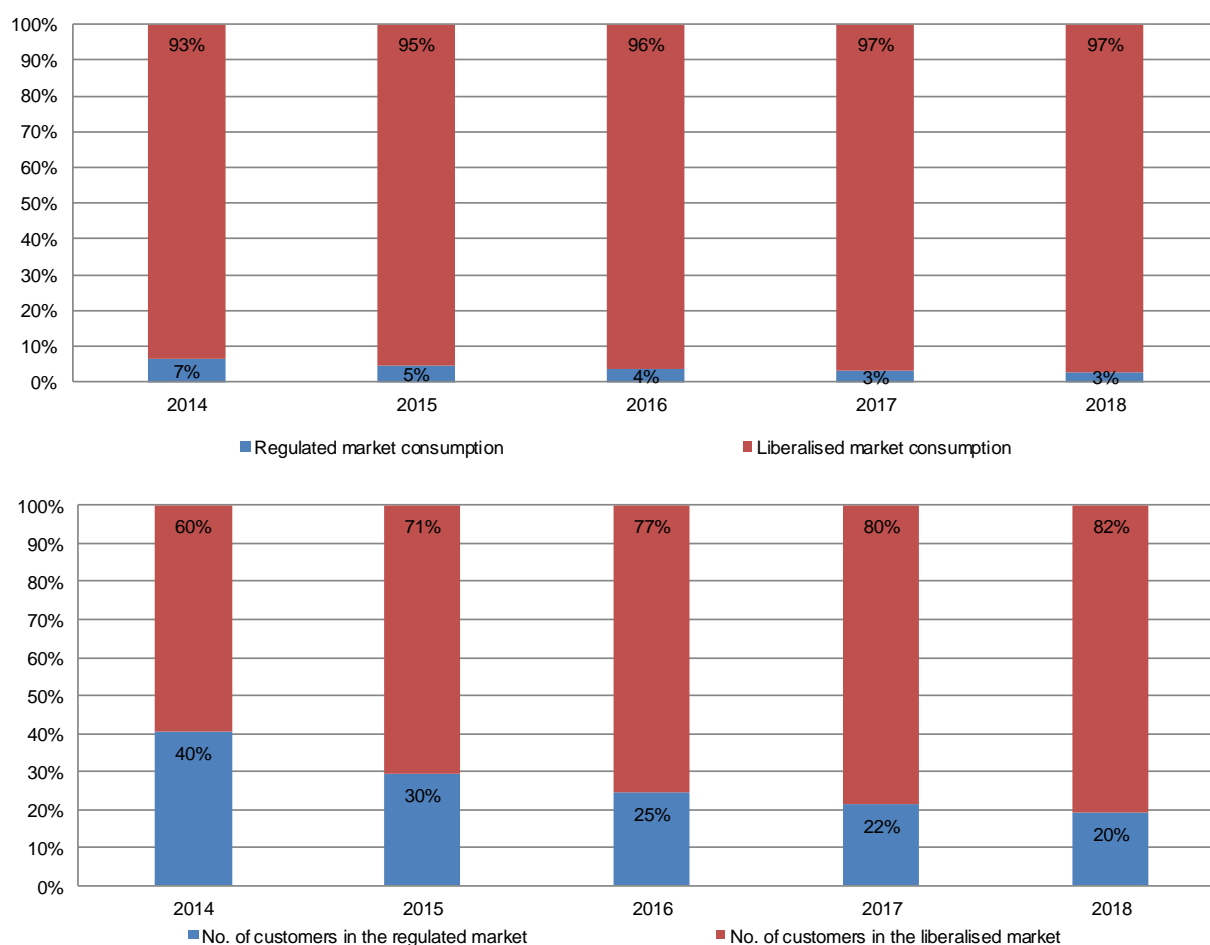


Source: REN Gasodutos data.

Note: BRG – Beiragás; DNG – Dianagás; DRG – Duriensegás; LBG – Lisboaagás; LTG – Lusitaniagás; MDG – Medigás; PTG – REN Portgás; PXG – Paxgás; SNG – Sonorgás; STG – Setgás; TGG – Tagusgás; REN – REN Gasodutos; DSO – the distribution system operators as a whole; Overall – DSO and REN.

The increase in the size of the liberalised market, as we can see in Figure 4-16, was also due to the phasing out of regulated tariffs that, in January 2013, covered all customers, including households.

Figure 4-16 – Breakdown of consumption between the regulated and the liberalised markets, 2014 to 2018

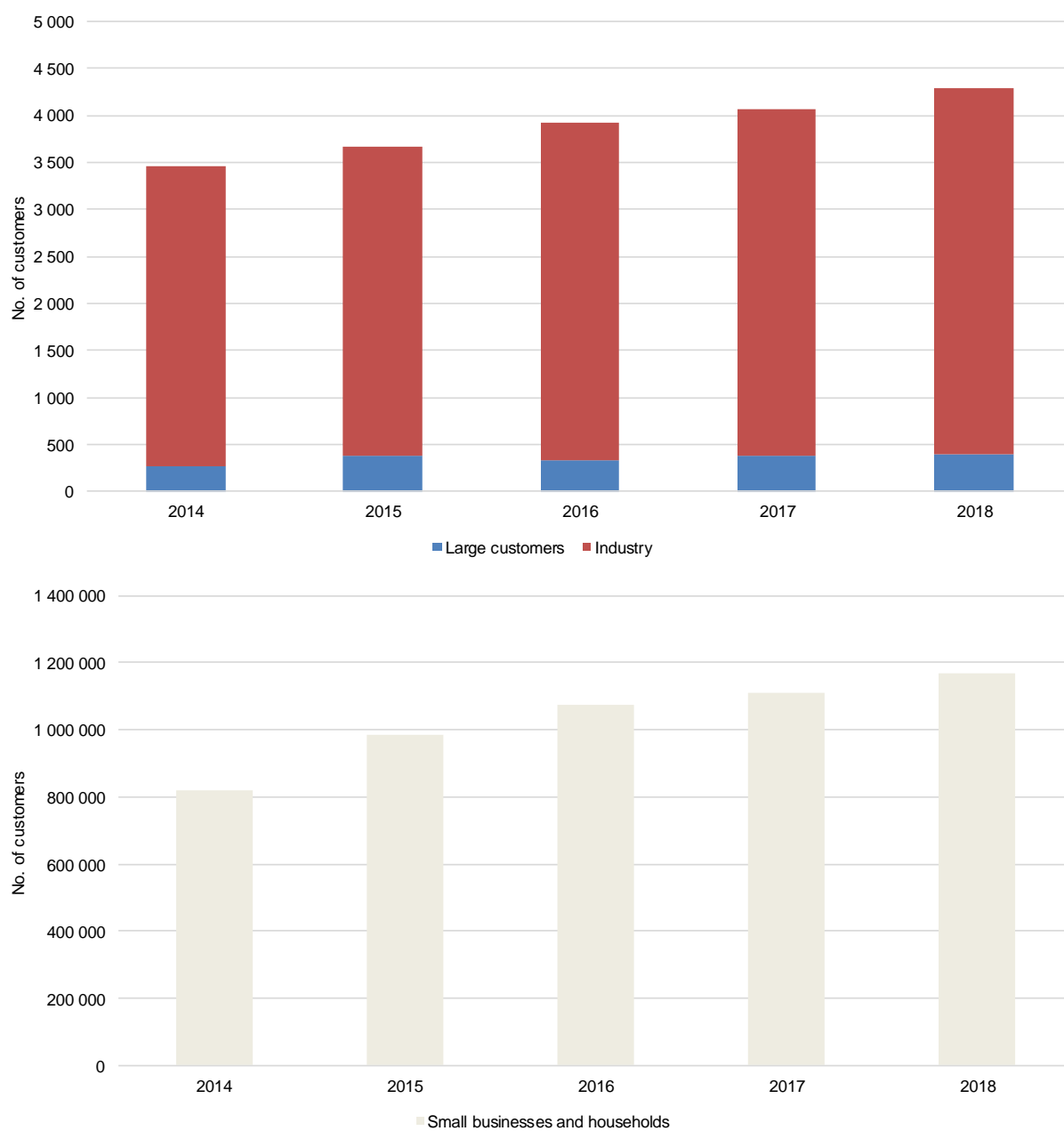


Source: REN Gasodutos data

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 enterprises (segments with consumption lower than 10,000 m³), and, also, the entry of industrial customers (with consumption between 10,000 m³ and 1 million m³), which, in 2018, increased nearly 6% compared to the previous year (see Figure 4-17).

In 2018, approximately 81% of the customers were already on the liberalised market.

Figure 4-17 – Evolution of the liberalised market in Mainland Portugal, 2014 to 2018

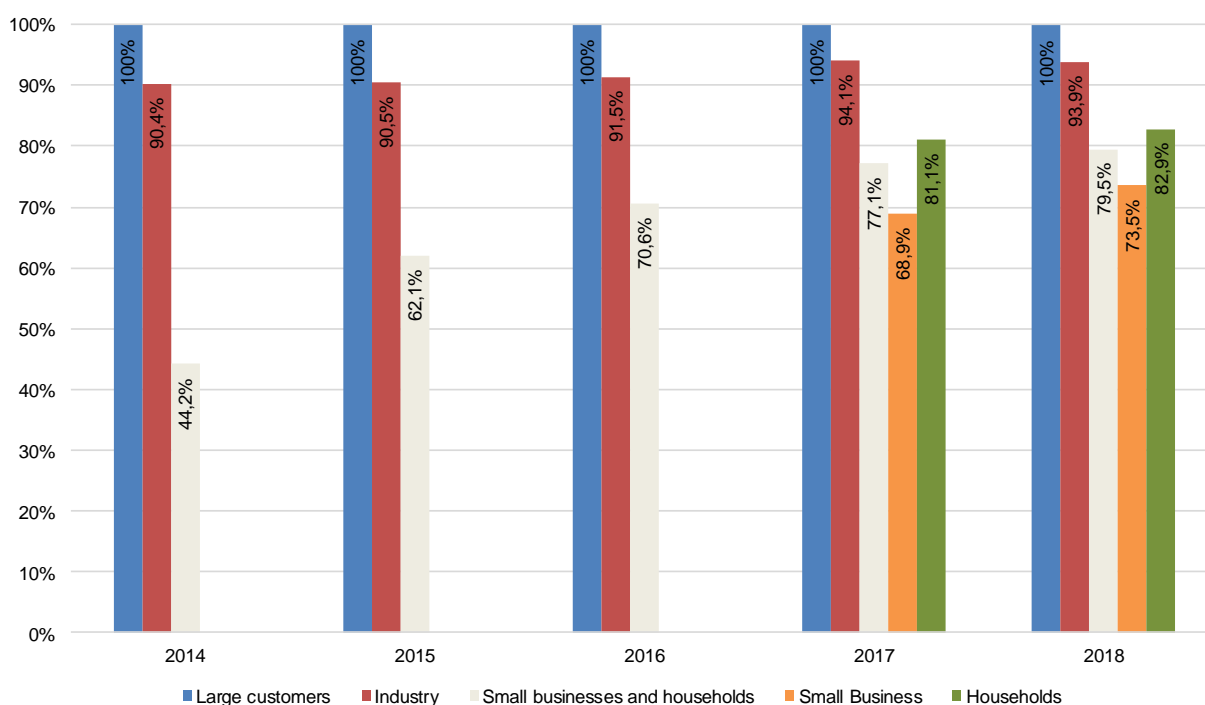


Source: REN Gasodutos data

In Figure 4-17 we can also see that, in 2018, the segment with the highest consumption, corresponding to large customers (with consumption higher than 1 million m³), showed a slight increase of 4% compared to 2017. The number of household and small business customers increased 5% respectively.

The consumption associated with each customer segment of the liberalised market is shown in Figure 4-18, and it is noticeable that, at least since 2014, market suppliers ensured the whole of the consumption by large customers.

Figure 4-18 – Penetration of the liberalised market by customer segment, 2014 to 2018



Source: REN Gasodutos data

The values specifically relating to the industrial customers segment follow the same rationale as that for total customers. It should be noted that, overall, more than 94% of consumption from this group of customers is already being supplied by suppliers on the liberalised market.

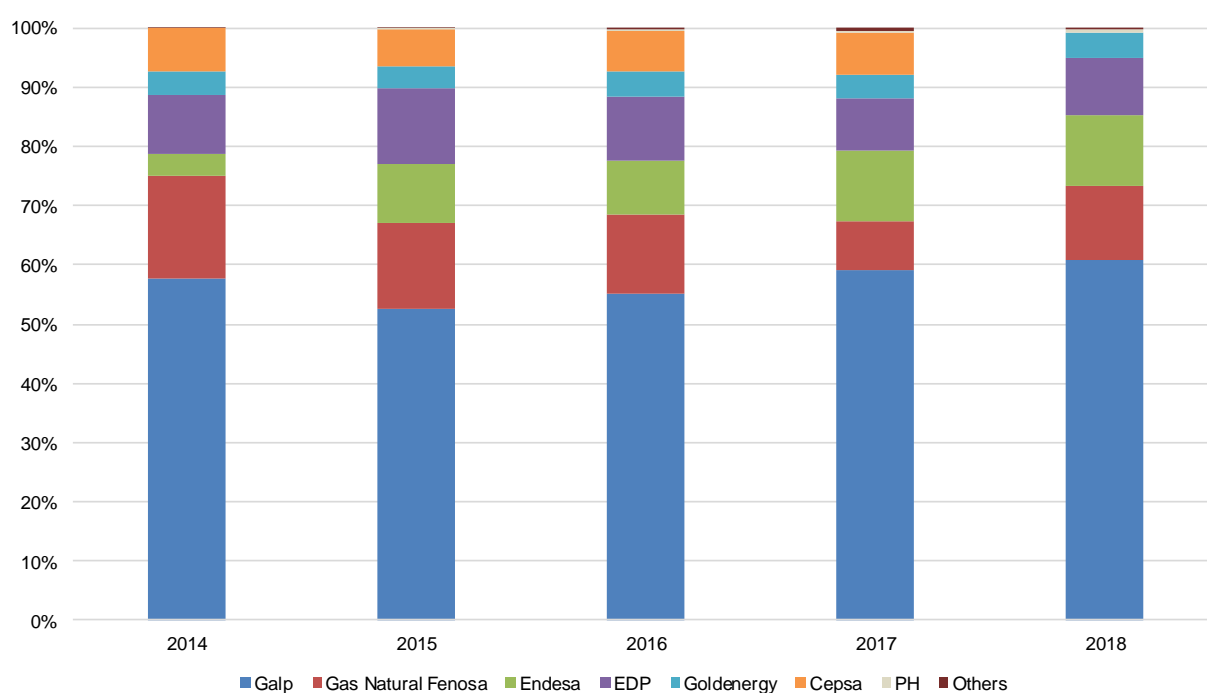
With regard to the liberalised market, there was one supplier with a market share of over 50% at the end of 2018. The industrial customers segment is the most competitive one; the household customers segment is also characterised by high competitiveness.

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.

As opposed to the trend observed in 2017, of an increase in the overall corporate concentration on the household customers segment, in 2018 there was a decrease in the level of concentration in terms of the number of customers. As regards consumption, there was an increase in the level of concentration.

The market share of the Galp Group, the main operator on the natural gas market, having decreased in past years (70% of consumption in 2013), witnessed a slight increase, between 2014 and 2018. In 2018, its market share was 61%, as we can see in Figure 4-19.

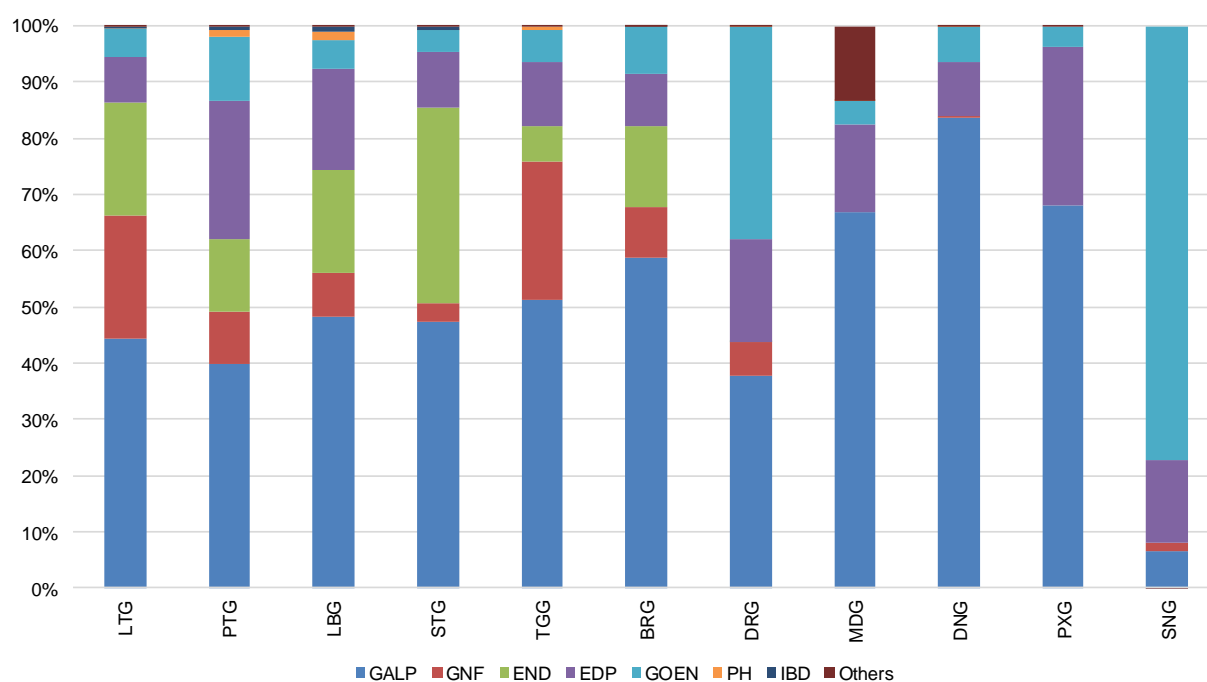
Figure 4-19 – Supply structure in the liberalised market by supplier, 2014 to 2018



Source: REN Gasodutos data

The breakdown of market share by distribution network, in terms of consumption supplied is shown in Figure 4-20. In 2018, the Galp Group had a market share above 40% in more than half of the distribution networks.

Figure 4-20 – Breakdown of consumption by suppliers on the liberalised market and by distribution network, 2018



Source: REN Gasodutos data

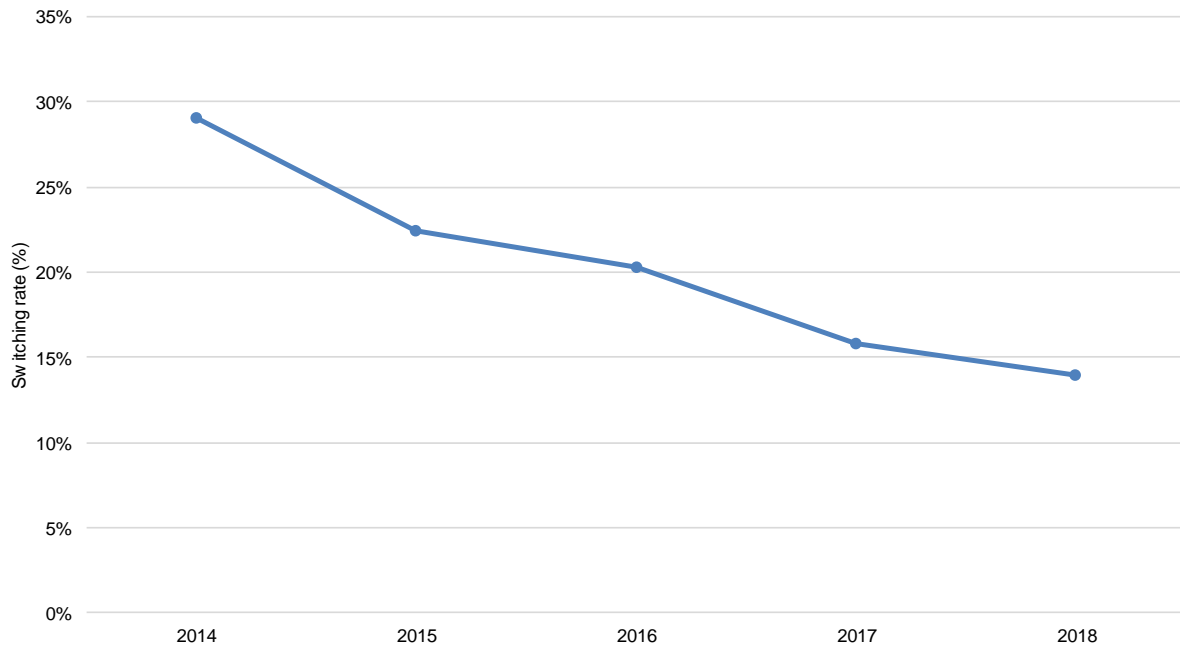
In terms of the share of natural gas supply, in 2018, EDP Comercial assumed significant positions in the distribution networks operated by REN Portugal (PTG), LisboaGás (LBG), PaxGás (PXG), DurienseGás (DRG) and Medigás (MDG).

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

Endesa and Gás Natural Fenosa have relevant positions in the areas managed by Lusitaniagás (LTG), REN Portugal (PTG), LisboaGás (LBG), SetGás (STG), Beiragás (BRG) and TagusGás (TGG).

The switching rates remain relevant despite the downward trend observed in recent years. In 2018, about 14% of gas consumers switched supplier, as shown in Figure 4-21.

Figure 4-21 – Gas supplier switching in number of clients, 2014 to 2018



Source: EDP Distribuição data

An analysis of the evolution of the retail market is available on the ERSE website in the form of a monthly report¹²⁹, 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 2018, ERSE did not publish any recommendations regarding the compliance of supply prices with Article 3 of Directive 2009/72/EC of the European Parliament and of the Council, of 13 July. We should highlight that the transitional regime for regulated natural gas to end-customers in LP and MP is still in force.

¹²⁹ <http://www.erse.pt/pt/electricidade/liberalizacaodosector/informacaosobreomercadoliberalizado/2016/Paginas/2016.aspx>

MEASURES TO PROMOTE EFFECTIVE COMPETITION

As mentioned above in relation to the wholesale market, ERSE has specific duties granted to it by the legal framework governing the gas sector as well as other tasks, which arise from competition law. In 2018, ERSE issued an opinion to the Competition Authority on the acquisition by AXPO International, S.A., of the exclusive control over Goldenergy – Comercializadora de Energia, S.A (GOLDENERGY), company controlled jointly by the companies AXPO and Dourogás – Participações Sociais, S.G.P.S.. The operation was related to electricity and natural gas supply activities. However, before this acquisition, AXPO did not have any activities related to the natural gas supply in Mainland Portugal. ERSE expressed its non-opposition to the realisation of the operation.

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

Since 1 July 2012¹³⁰, natural gas regulated tariffs for supply of natural gas to end-customers with annual consumptions lower or equal to 10 000 m³, published by ERSE for Mainland Portugal, have a transitional nature.

In 2018, these tariffs applied to the supply of the retail supplier of last resort (CURR) in low and minimum pressure; transitional high pressure tariffs were abolished.

Transitional tariffs for end-customers are determined by the sum of network and infrastructure access tariffs with the transitional energy tariff and the regulated commercialisation tariff¹³¹, all approved by ERSE¹³².

4.3 SECURITY OF SUPPLY

ERSE monitors gas capacity allocation in the RNTGN, in particular the level of available capacity for commercial purposes compared to the capacity that has been utilised.

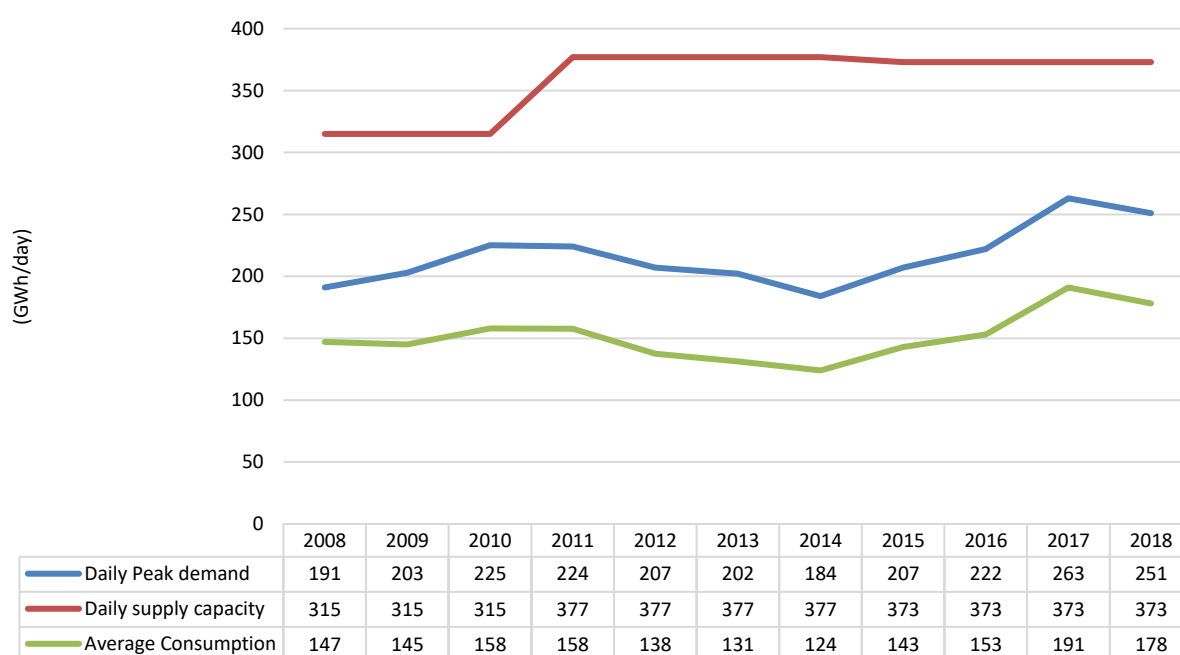
¹³⁰ For consumers with annual consumption higher than 500 m³ and 1 January 2013 for consumers with annual consumption equal to or lower than 500 m³, according to [Decree-Law n.º 74/2012, of 26 March](#).

¹³¹ The transitional tariff regime is determined by the joint application of the [Government Ordinance n.º 108-A/2015, of 14 April](#), and [Government Ordinance n.º 359/2015, of 14 October](#). [Order n.º 7557-A/2017, of 25 August](#) also applies. It revoked Order n.º 11 566-A/2015, of 3 October.

¹³² [Directive n.º 2/2018, of 4 January](#).

Figure 4-22 presents the evolution of supply capacity in the SNGN¹³³, the daily average consumption and annual peak demand between 2008 and 2018. During this period, the daily average consumption of natural gas increased at an average rate of 2% per year. The highest annual peak demand in the SNGN occurred in 2017, with a value of 263 GWh/day.

Figure 4-22 – Evolution of supply capacity in the SNGN, daily average consumption and peak demand, from 2008 to 2018



Source: REN – Technical Data for 2018

As shown in the figure, the daily supply capacity increased by 20% between 2010 and 2011 and decreased 1% between 2014 and 2015; remaining stable in the subsequent years. In addition, the daily supply capacity in the SNGN is much higher than the daily peak demand for the period under analysis. In 2018, average consumption and peak demand corresponded to 48% and 67% of the supply capacity in the SNGN, respectively.

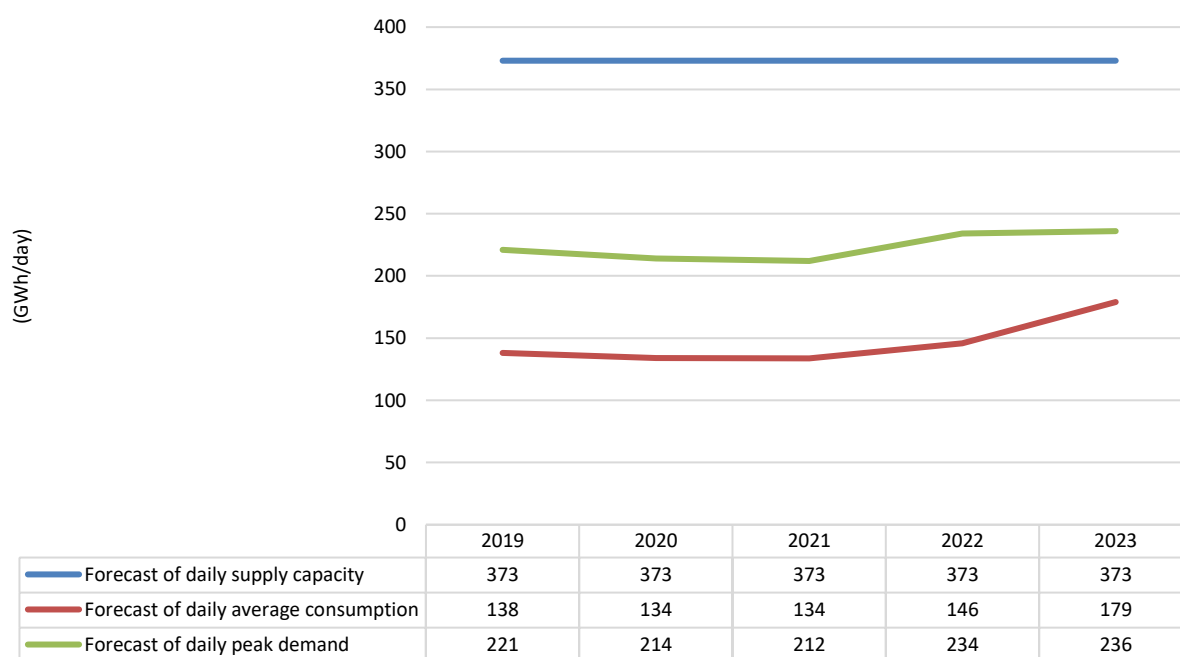
¹³³ The capacity offered in the SNGN corresponds to the sum of the entry capacity at the Campo Maior and Valença do Minho interconnections and the connection between the RNTGN and the Sines LNG terminal.

4.3.1 FORECAST OF DEMAND AND SUPPLY

Figure 4-23 shows forecasts of daily supply capacity in the SNGN, daily average consumption and peak demand, for the outlook period 2019-2023.

Based on data provided by REN Gasodutos, the expected available capacity for commercial purposes is considerably higher than the expected capacity that will be used in the coming years. In 2023, average consumption and peak demand are expected to represent about 48% and 63% of the supply capacity in the SNGN, 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 2018-2027 do not have any impact on the available capacity.

Figure4-23 – Forecast of daily supply capacity in the SNGN, daily average consumption and peak demand, - from 2019 to 2023



Source: REN Gasodutos – PDIRGN 2018-2027

4.3.2 MEASURES TO COVER PEAK DEMAND OR SHORTFALLS OF SUPPLIERS

The promotion of conditions to cover peak demand or shortfalls of suppliers and guarantee SNGN's security of supply is based on both supply side and demand side measures.

Although the SNGN is still partially dependent on a major gas supplier - Algeria - the diversification of sources of supply was enhanced by the Sines LNG terminal, which entered into operation in 2004.

Another initiative to promote security of supply regarding diversification of sources of supply is the integration of the Portuguese market into an Iberian market. Indeed, in 2018 as in 2017, the existence of market agents in the SNGN with significant activity in Spain, led to an increase in the use of interconnections, with the Portuguese market benefitting from the diversification of sources of supply in Spain.

Another way to ensure security of gas supply is to create and maintain emergency stocks able to ensure the gas supply to the protected customers, according to Regulation (EU) 2017/1938 of the European Parliament and of the Council of 25 October 2017 concerning measures to safeguard the security of gas supply, and 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 2017-2025” (published by DGEG), the RNTIAT has sufficient storage capacity to cover all the emergency stock needs.

In addition to the measures adopted to safeguard the security of gas supply and to meet peak demand, on the supply side, 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. In fact, Tapada do Outeiro and Lares are bi-fuel power plants and are contractually authorised to guarantee their functioning by supplying alternative fuel to natural gas, according to Article 50.º-B of Decree-Law n.º 140/2006, of 26 July as amended by Decree-Law n.º 231/2012, of 26 October.

5 CONSUMER PROTECTION AND DISPUTE SETTLEMENT

5.1 CONSUMER PROTECTION

In 2018, ERSE continued to pursue its general duty of energy consumer protection. This is a cross-cutting concern for ERSE's overall activities, being present in all regulatory initiatives and decisions, namely in the promotion of transparent and fair trade relation rules, tariffs and prices that reflect efficient costs, quality of services provided and promotion and clarification of information.

Within this framework, we underline the consumer protection activities which are continuously developed and can be identified by the following themes: (i) regulatory measures; (ii) verification of compliance with legislation; (iii) availability of information; and (iv) other developments in the area of consumer relations.

ERSE verified and monitored the changes introduced by certain suppliers under the general conditions of the proposed supply contracts and those presented by new suppliers.

In the information to consumers, in addition to responding to individually presented issues, dealt with through the complaint handling service, ERSE also periodically elaborates and disseminates educational and informative contents through the "Portal do Consumidor", a special area of its website especially dedicated to energy consumers.

This resulted in updating information residing on this portal, in particular information associated with the commercial cycle of electricity and natural gas supply, which are frequently accessed by consumers.

In parallel, the production of Alerts of Bad Practices was continued. These alerts were launched on 29 May 2017 (World Energy Day) and they were prepared and targeted to consumers with greater vulnerability in access to information. These alerts highlight some commercial practices carried out by energy traders that are should be avoided or prevented, in particular with simple practical advice.

In 2018, in addition to its diffusion, a paper brochure was published, bringing together a selected set of these alerts. In the same way, two other brochures were produced, containing, in a summarised way, information contained in the interactive pedagogical modules "Electricity: How does it work?" and "Natural gas: How does it work?" produced in 2017.

A number of useful advice - "Anotes" - was also prepared, initially intended to be inserted only in communications addressed to consumers interacting with ERSE in the context of complaints or requests

for information. The printing of a set of "Anotes", which was added on the back of energy savings "Tips", was widely disseminated, addressed to consumer organisations, to Alternative Dispute Resolution (ADR) entities, autarchies, energy agencies, etc.

The ERSEFORMA programme, whose main objective is to support institutions with responsibilities for clarifying consumers and the power to disseminate with multiplier effect information on the energy sector - alternative dispute resolution entities, arbitration centres, consumer associations, municipal public sphere entities and the central government - opened its 2018 programme for these entities with an action on energy tariffs.

ERSE also accepted the invitation to participate in the Roadshow organised by the Directorate-General for Consumer Affairs, as part of the World Consumer Rights Day celebrations, and was present in Tavira (6 March), Coimbra (13 March) and Porto (26 March).

ERSE also participated in training actions promoted by the Consumer Information and Arbitration Centre of Vale do Cávado (CIAB), dedicated to the theme "Essential Public Services" (31 October), and Triave - Consumer Conflict Arbitration Centre of Vale do Ave, on "Electricity and Natural Gas - Procurement and Execution of the Supply Contract" (5 December).

The information and training material used in the actions described are available on the ERSE website at: www.erse.pt/consumidor/erseforma.

Regarding dispute resolution (commercial and contractual disputes), in addition to clarifications for the parties involved, ERSE can recommend or suggest the resolution of a dispute, although ERSE cannot impose the solution of the concrete dispute.

At the same time, ERSE encourages the use of conflict arbitration, especially in the context of existing arbitration centres for consumer disputes, through cooperation protocols. In the next chapter, we consider more detailed information on complaint handling carried out by ERSE in 2018.

5.2 DISPUTE SETTLEMENT

In its direct role regarding the management of disputes, ERSE promotes the use of voluntary arbitration and makes use of other mechanisms of a voluntary nature for the resolution of litigation, through which ERSE can recommend the resolution of concrete cases.

ERSE may also carry out inspections of the complaints records and examination of the facilities of the electricity and natural gas suppliers and DSOs in order to assess their compliance with the law and the regulations of the sector, in particular with regard to the specific obligations relating to the Complaints Book.

These tasks are internally assigned to a team dedicated to supporting the energy consumer. The ACE (Energy Consumer Support) unit is an autonomous functional unit whose activity is based on three main areas: i) consumer information; ii) consumer education and training; and iii) complaint handling / dispute resolution.

The statutory task of informing and clarifying energy consumers was accomplished in 2018 through written response to information requests, telephone assistance through a dedicated call centre available every working day from 3:00 p.m. to 6:00 p.m., and the creation and update of information both on the ERSE website and on paper. This service is provided directly by ERSE employees. ERSE also provides face-to-face service, subject to prior appointment.

Requests for information addressed to ERSE in writing originate from several channels, with more and more emphasis on electronic media. On 1 July 2017, the electronic complaint platform of the Electronic Complaints Book was launched, allowing consumers to fill in a complaint form or an information request form. The information request is directly and exclusively sent to the sectoral regulator.

Between 1 January and 31 December 2018, ERSE received 1,189 requests for information via the Electronic Complaints Book platform. The total number of information requests registered in ERSE in 2018 was 1,911.

Billing and issues related to tariffs and prices as well as issues regarding the supply contract were the main topics raised.

Both complaint handling and response to information requests are based, firstly, on a computer tool for process management (CRM) through which the various stages of the process are managed, from screening to final response, through analysis requests for technical support from other regulatory departments.

In 2018, 29,510 complaints were registered, leading to new case files. In the same year, 31,033 cases (including complaints and information requests) were concluded, mostly with information to the consumer, after analysing the response obtained from the company being complained about.

Regarding the thematic distribution, the electricity sector was more prominent, with 58% of the total number of complaints received. This is justified by the fact that electricity consumers (around 6 million) are far more numerous than natural gas consumers (approximately 1.5 million), which accounted for 7% of requests assigned to ERSE.

Dual supply (electricity and natural gas) shows a growing trend (19%) and complaints for the fuel and piped LPG sectors (15%) have started for the first time to be received at ERSE as of 1 July 2017, the date of entry into force of the new legal regime of the complaints book, introduced by Decree-Law n.º 74/2017, of 21 June, which, among other changes, gave ERSE new verification powers.

The digital platform of the electronic complaints book, which came into operation on the same date, was responsible for the entry into ERSE of 13,306 complaints, registered until 31 December 2018.

Billing also emerged as the hottest item in 2018 (10,534), followed by issues related to the supply contract (3,217).

6 COMPLIANCE

6.1 CERTIFICATION OF TRANSMISSION NETWORK OPERATORS

REN – Rede Elétrica Nacional, as operator of the National Electricity Transmission Network and REN Gasodutos, as operator of the National Natural Gas Transmission Network, were certified by ERSE in 2015, as TSOs under a full ownership unbundling regime.

The procedure for certification of the National Electricity Transmission Network and National Natural Gas Transmission Network, a competence of ERSE, provides for an evaluation of the assessment of compliance with the conditions relating to the legal and patrimonial separation of these operators.

Since 2015, ERSE has been, monitoring compliance and doing a permanent supervision of the certification conditions granted to those operators.

Within this framework, the electricity transmission system operator and the natural gas transmission network operator shall send to the ERSE, until 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 transmission system operator provided for in the legal certification scheme, as well as all the general meeting minutes of the economic group to which it belongs.

The electricity transmission system operator, as well as the natural gas transmission system operator must also send to ERSE simultaneously the communications regarding qualified participations and annual and half-yearly information that REN - Redes Energéticas Nacionais, SGPS, S.A. disclosed to the market or to the financial regulator, CMVM.

These obligations were fulfilled by the RNT (electricity) operator and by the RNTGN (natural gas) operator, allowing ERSE, during 2018, to ensure the compliance of the conditions established in the certification decision of REN - Rede Elétrica Nacional, SA and REN Gasodutos, S.A., according to reports from REN - Rede Elétrica Nacional and REN Gasodutos sent to ERSE in June 2018.

6.2 LEGISLATIVE DEVELOPMENTS

Within the scope of the powers attributed to it by its Statutes and other applicable legislation, ERSE has met the obligations inherent to its capacity as regulator.

For such, ERSE approves codes, issues binding decisions on regulated companies, issues opinions on matters requested by the Government, Parliament or other public administration entities.

Additionally, it carries out surveys on the functioning of the natural gas markets; has the capacity to demand, from electricity and natural gas companies, information relevant to the fulfilment of its functions, requests and promotes the realisation of audits on companies subject to regulations issued by ERSE and develops other supervision and inspection activities.

Also, ERSE promotes information and clarification for electricity and natural gas consumers, handles their grievances and complaints and intervenes in extrajudicial dispute resolution and sanctions behaviour by regulated companies that constitute administrative offences.

In 2018, ERSE published the following regulations:

- Regulation n.º 224/2018, of 16 April – First amendment to the Natural Gas Commercial Relations Regulation.
- Regulation n.º 225/2018, of 16 April – Approves the Gas Natural Tariff Regulation.
- Regulation n.º 385/2018, of 21 June – Amendment to the Gas Natural Tariff Regulation.
- Regulation n.º 387/2018, of 22 January – Second amendment to the Natural Gas Commercial Relations Regulation.

Within the scope of regulatory measures, we highlight the following legislative instruments approved by ERSE in 2018:

- Directive n.º 1/2018, of 3 January- Implementation of the scheme treated as transitional tariffs.
- Directive n.º 2/2018, of 4 January - Tariffs and prices for electricity and other services in 2018.
- Directive (extrat) n.º 3/2018, of 11 January - Profiles of consumption, production and self-consumption applicable in 2018

- Directive (extrat) n.º 4/2018, of 11 January- Loss profiles applicable in 2018
- Directive n.º 5/2018, of 18 January- Rates and prices for electricity and other services in 2019.
- Directive n.º 6/2018, of 27 February - Approval of the rules for the pilot projects to improve the tariff structure and dynamic tariffs in the Access to Networks in EHV, HV, and MV in Mainland Portugal.
- Directive n.º 7/2018, of 28 March – Guide on Measurement, Reading and Availability of Data in the Natural Gas Sector
- Directive n.º 8/2018, of 30 April- Provision of electricity to occasional installations
- Directive n.º 9/2018, of 22 June - Approves Natural Gas Prices and Prices for gas year 2018-2019
- Rectification Statement n.º 573/2018, of 16 August- Declares the rectification of Directive n.º 9/2018 of 22 June
- Directive n.º 10/2018, of 10 July - Continuous intraday market implementation and approval of the Global System Management Procedures Manual and the Manual of Procedures for the Joint Management Mechanism of the Portugal-Spain interconnection
- Directive n.º 11/2018, of 16 July - Transitional regime of risk and guarantee management in SEN
- Directive n.º 12/2018, of 26 July- Approval of the enrollment in Balance Areas of the Physical Unit related to the hydroelectric development of Labruja
- Directive n.º 13/2018, of 6 August - Approves the profiles of natural gas consumption and average daily consumption approved by ERSE to be in force in the year 2018-2019 gas
- Directive n.º 14/2018, of 10 August- Amendment of Procedure n.º. 5 of the Manual of Procedures for the Global System Management of the electricity sector
- Directive n.º 15/2018, of 19 December - Procedures for change of supplier in the electricity sector and in the natural gas sector
- Instruction n.º 4/2018, of 13 September- Instruction on the Return of Credits of Electricity Consumers

- Instruction n.º 5/2018, of 18 September- Instruction to last resort retailers regarding the supply to customers of the supplier Crieneco Unipessoal, Lda.
- Instruction n.º 6/2018, of 18 September - Instruction to the logistic operator of change of supplier, regarding supply to customers of the supplier Crieneco Unipessoal, Lda.
- Instruction n.º 7/2018, of 18 September- Instruction to the natural gas distribution network operators, regarding the supply to customers of the supplier Crieneco Unipessoal, Lda.
- Instruction n.º 8/2018, of 17 October- Instruction to EDP Serviço Universal regarding the supply to customers of the supplier Elusa, Lda.
- Instruction n.º 9/2018, of 17 October - Instruction to the Logistic Operator of Change of Supplier, regarding the supply to customers of the supplier Elusa, Lda.
- Instruction n.º 10/2018, of 17 October- Instruction to operators of electricity distribution networks, regarding the supply to customers of the supplier Elusa, Lda.

6.3 SANCTIONS REGIME

As part of the Energy Sector Penalty System, approved by Law nº 9/2013, of 28 January, in 2018, ERSE received 91 complaints. 39 complaints were filed for lack of sufficient grounds to be followed up, in the same period, 38 complaints gave rise to or included cases of misconduct.

The main issues denounced were the commercial relationship, communication of readings and billing, efficacy of service, unfair commercial practices (in particular, contracting of supply through aggressive practices), unjustified interruption of supply of electricity and natural gas, additional services, quality of commercial service, delay in changing the supplier (switching), and not making the Complaints Book available.

In addition, 29 counter-administrative processes (electricity and natural gas) were opened and 15 final decisions were handed down by ERSE.

Of the final decisions handed down, 10 are final filing decisions, 15 are final decisions for conviction for infractions, 1 of which is subject to admonitions and 14 are fine convictions (3 in a settlement proceeding, 9 for voluntary payment of the fine and 2 for conviction with a fine. In the latter case, the affected party

did not pay the fine and the process was sent to the Tribunal Competition, Regulatory and Supervisory Court for enforcement). None of ERSE's decisions were judicially challenged.

During the year 2018, 6 notes of illegality were deducted.

6.4 ELECTRIC MOBILITY

MOBI.E, S.A. has performed the management of the electric mobility network. MOBI.E, S.A. is also, in a transient way, an electricity supplier for electric vehicle charging points. The network operated by MOBI.E, S.A. has been expanding, and it is anticipated shortly that about 1,600 normal charging points will be available.

November 2018, marked the beginning of charging with costs to the users at fast charging points, thus initiating the application of the definitive model, which allows customers to choose among the available commercial offers, the supplier and charging point.

ERSE held a wide range of meetings with MOBI.E, SA, as the Managing Entity of the Electric Mobility Network (EGME), in order to promote the publication of the Manual of Procedures of EGME, foreseen for 2019. Meetings were also held with the operator of the HV / MV network and with suppliers of electric mobility.

ERSE published in 2018 the prices of the access tariffs to the electric mobility network.

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 - Electrical Power Purchase Agreements
- CAPEX - Capital Expenditure
- CCGT - Combined Cycle Gas Turbine
- CDS - Credit Default Swaps
- CEER - Council of European Energy Regulators
- CIEG - General Economic Interest Costs
- CMEC - Costs of Maintenance of Contractual Equilibrium
- CNMC - *Comisión Nacional de Mercados y Competencia (Spain)*
- CMVM - Comissão de Mercados e Valores Mobiliários (Portuguese Securities Market Regulator)
- CNMV - *Comisión Nacional de Mercados de Valores (Spain)*
- DGEG - Directorate-General for Energy and Geology
- DSO - Distribution System Operator
- 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
- 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 - Procedures Manual 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
- OMI - Iberian Market Operator
- OMIE - Iberian Energy Market Operator – Spanish Section, S.A.
- OMIP - Iberian Market Operator - Portuguese Section
- OPEX - Operational Expenditure
- 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
- 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
- SLR – 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
- VIP - Virtual Interconnection Point

II. LIST OF LEGISLATION

A. NATIONAL LEGISLATION

In 2018, as relevant, the following legal acts were published:

- Decree-Law n.º 5/2018, of 2 February - Establishes the criteria defining the process of receiving, returning and exchanging used bottles of liquefied petroleum gas and the terms of mandatory marketing at the gas station for bottled liquefied petroleum gas.
- Decree-Law n.º 11/2018, of 15 February - Establishes the basic restrictions or reference levels related to human exposure to electromagnetic fields derived from lines, installations and other equipment of high and extra high voltage, regulating Law n.º. 30/2010, of 2 September.
- Resolution of the Council of Ministers n.º 12/2018, of 19 February - Approves a set of measures aimed at updating the legal regime of the Pilot Zone for oceanic renewable energies.
- Government Ordinance n.º 62/2018, of 2 March - Approval of the regulation for the attribution of production licenses or acceptance of prior notice for the production of electricity under special regime and in the general remuneration regime.
- Order n.º 4389-A/2018, of 3 March - Determines that the value of parameter "k", for the year 2018, takes the value of 1, established by Decree-Law n.º. 4/2018, of 2 February, created an incentive, which takes the form of a discount applied to electricity price, applicable to electric vehicles.
- Parliament Resolution n.º 71/2018, of 19 de March - Recommends that the Government develop a programme to promote the use of agroforestry biomass for self-consumption.
- Parliament Resolution n.º 76/2018, of 22 March - Recommends that the Government reinforce the information given to consumers in the invoices relating to the commercialisation of fuels.
- Order n.º 3121/2018, of 27 March - Determines the discount to be applied in tariffs for access to natural gas networks, applicable of 1 July 2018.
- Law n.º 20/2018, of 4 May - Strengthens the rules of protection against exposure to electromagnetic fields, by making the first amendment to Law n.º. 30/2010, of 2 September.

- Decree-Law n.º 36/2018, of 22 May- Approves the extraordinary regime on the temporary supply of electricity to houses integrated in areas of precarious housing.
- Law n.º 61/2018, of 21 August- First amendment, by parliamentary appreciation, to Decree-Law n.º. 96/2017 of 10 August, which establishes the regime of private electrical installations.
- Decree-Law n.º 69/2018, of 27 August- Restructures the National Entity for the Fuel Market, E. P. E., Directorate General of Energy and Geology and the National Laboratory of Energy and Geology, I. P.
- Government Ordinance n.º 240/2018, of 29 August - Approval of the pilot project to apply the liquefied petroleum gas (LPG) solidarity tariff to be applied to economically vulnerable end-users.
- Government Ordinance n.º 246/2018, of 3 September - Determines the mandatory consultation of the Energy Services Regulatory Authority (ERSE) in the scope of authorisation procedures for wind farm equipment, and defines decision criteria to be adopted, by amending the Administrative Rule n.º. 102/2015, of 7 April.
- Government Ordinance n.º 269/2018, of 26 September - Government Ordinance that proceeds to the second amendment of Administrative Rule n.º. 246-A / 2016, of 8 September, which establishes the conditions and procedures for the regime of partial reimbursement of taxes on fuels for freight companies, provided for in article 93. (AEC), approved by Decree-Law n.º. 73/2010, of 21 June.
- Order n.º 9217/2018, of 1 October - Determines the discount to be applied in tariffs for access to electricity networks, applicable on 1 January 2019.
- Order n.º 10346/2018, of 8 November - Determines the amendment to Dispatch n.º. 15793-H / 2013, of 2 December.
- Government Ordinance n.º 301-A/2018, of 23 November- Sets the value of unitary taxes on petroleum and energy products (ISP).
- Decree-Law n.º 109/2018, of 7 December- Alters the Fund for the Systemic Sustainability of the Energy Sector.
- Decree-Law n.º 152-C/2017, of 11 December - Transposes Directive 2015/1513 amending Directive 98/70 / EC on the quality of petrol and diesel fuels and Directive 2009/28 / EC on the promotion of the use of energy from renewable sources.

- Decree-Law n.º 11/2018, of 15 December- Establishes the basic restrictions or reference levels related to human exposure to electromagnetic fields derived from lines, installations and other equipment of high and extra high voltage, regulating Law n.º. 30/2010, of 2 September.

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. 205/2015 of 23 September, which amends Decree-Law n.º 57/2008 of 26 March, concerning the legal framework 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 extinction 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.

- Decree-Law n.º 2/2015 of 6 January, which amends Decree-Law n.º 195/99 of 8 June, thus extending the deadline for submitting requests for the reimbursement of deposits paid for essential public services, such as electricity and natural gas, to the consumers, while creating additional obligations regarding the provision of information to customers whose deposits are yet to be refunded.
- 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 extinction of transitory tariffs applicable to the supply of natural gas.
- Government Ordinance n.º 364-A/2017, of 4 December which amends n.º 2 of Order n.º 27/2014, of 4 February which amends the date provided for in n.º 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 free 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 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 230/2012 of 26 October, which introduces the fifth amendment to Decree-Law n.º 30/2006 of 15 February and completes the transposition of Directive n.º 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. It also implements Regulation (EC) n.º 715/2009 of the European Parliament and of the Council of 13 July, on conditions for access to the natural gas transmission networks and repealing Regulation (EC) n.º 1775/2005, and Regulation (EU) n.º 994/2010 of the European Parliament and of the Council of 20 October, concerning measures to safeguard security of gas supply and repealing Council Directive 2004/67/EC.

- Decree-Law nº. 215-B/2012 of 8 October, which introduces the sixth amendment to Decree-Law o. 172/2006 of 23 August, 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.
- Decree-Law nº. 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.
- Parliamentary Resolution nº. 23/2006, which approves the Agreement between the Portuguese Republic and the Kingdom of Spain for the Constitution of an Iberian Electrical Energy Market (MIBEL), signed in Santiago de Compostela on 1 October 2004.
- Resolution of the Council of Ministers nº. 20/2013, published in the Official Gazette, 1st series 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 nº. 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 nº. 237/2015 of 12 August, which amends Order n.º 278-C/2014 of 29 December, which defined new procedures and conditions for the granting, application and maintenance of the social tariff.
- Government Ordinance nº. 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 nº. 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 nº. 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 nº. 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 nº. 387/2018 of 22 January.
- Regulation nº. 225/2018 of 16 April, which approves the Tariffs Regulation for the natural gas sector.
- Regulation nº. 619/2017 of 18 December, which amends the Tariffs Regulation for the electricity sector.
- Regulation nº. 620/2017 of 18 December, which amends the Access to Networks, Infrastructures and Interconnections Code of electricity sector.
- Regulation nº. 621/2017 of 18 December, which amends Operation of Electricity Sector Networks Regulation.
- Regulation nº. 632/2017 of 21 December, which approves the Commercial Relations Regulation For electricity sector.
- Regulation nº. 629/2017 of 20 December, which approves the Quality of Service Code for the Electricity and Natural Gas Sector.
- Directive nº. 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 nº. 8/2015 of 27 May, of ERSE, which details the operative procedures for the application of these adjustments.
- Directive nº. 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.

- Order nº. 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 nº. 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 in what 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 nº. 18637/2010 of 15 December, of ERSE, which establishes the monitoring of reference prices and average prices charged by electricity supplies, 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.
- Order nº. 1801/2009 of 14 January, of ERSE, which proceeds with the quarterly review applicable to energy prices for natural gas tariffs in the 1st quarter of 2009.
- Decision nº. 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.
- Recommendation nº. 2/2013, concerning aspects of electricity contracting that are relevant for the consumers: the existence and scope of loyalty periods, the availability of payment forms and the indexing of prices on the liberalised energy market.

B. EU LEGISLATION

The following EU legislation was taken into account in the preparation of this report:

- Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading regime of the Community.
- Directive 2009/28/EC, of the European Parliament and of the Council of 23 April 2009, on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC.
- Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009, concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC.
- Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009, concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC.
- Directive 2003/54/EC of the European Parliament and of the Council of 26 June 2003 concerning common rules for the internal market in electricity and repealing Directive 96/92/EC.
- Commission Regulation N^o. (EU) 2015/1222 of 24 July 2015, establishing a guideline on capacity allocation and congestion management.
- Commission Regulation N^o. (EU) 2015/703 of 30 April 2015, establishing a network code on interoperability and data exchange rules.
- Commission Implementing Regulation (EU) N^o. 1348/2014 of 17 December 2014, on data reporting implementing Article 8(2) and Article 8(6) of Regulation (EU) n.º 1227/2011 of the European Parliament and of the Council on wholesale energy market integrity and transparency.

- Commission Regulation (EU) Nº. 543/2013 of 14 June 2013 on submission and publication of data in electricity markets and amending Annex I to Regulation (EC) No 714/2009 of the European Parliament and of the Council.
- Commission Regulation (EU) Nº. 984/2013 of 14 October 2013, establishing a Network Code on Capacity Allocation Mechanisms in Gas Transmission Systems and supplementing Regulation (EC) n.º 715/2009 of the European Parliament and of the Council of 13 July, on conditions for access to the natural gas transmission networks.
- Regulation (EU) Nº. 1227/2011 of the European Parliament and of the Council of 25 October 2011 on wholesale energy market integrity and transparency (REMIT).
- Regulation (EC) Nº. 2017/1938 of the European Parliament and of the Council of 25 October 2017 concerning measures to safeguard the security of gas supply and repealing Regulation (EU) No 994/2010.
- 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 and repealing Regulation (EC) No 1775/2005.
- Regulation (EC) Nº. 714/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity and repealing Regulation

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.



Rua Dom Cristóvão da Gama, 1 - 3º
1400 - 113 Lisboa
PORTUGAL

Tel. +351 213 033 200
www.erse.pt