ERSE
ENTIDADE REGULADORA
DOS SERVIÇOS ENERGÉTICOS

ANNUAL REPORT
ON THE ELECTRICITY AND NATURAL GAS MARKETS IN 2016
PORTUGAL

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ENERGY SERVICES REGULATING AUTHORITY

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1 FOREWORD

This report was prepared by the Portuguese Energy Services Regulatory Authority (ERSE, Entidade Reguladora dos Serviços Energéticos), the body in charge of regulating the natural gas and electricity sectors in Portugal, in compliance 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) on its activities and on any developments observed in the electricity and natural gas markets.

National legislation, namely Decree-Law No. 215-A/2012 of 8 October, and Decree-Law No. 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 Government member responsible for the energy sector, to the Portuguese Parliament and to the European Commission. The report must also be published.

The present report, whose structure was harmonised within the framework of the Council of European Energy Regulators (CEER), presents the main developments in the electricity and natural gas markets in Portugal, including subjects such as competition (both in the wholesale market and in the retail market), 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 2016. The report also includes the regulatory initiatives with an impact on future developments in the markets.

2 MAIN DEVELOPMENTS IN THE ELECTRICITY AND NATURAL GAS SECTORS

2016 brought the consolidation of the Portuguese electricity sector and also of a few development trends within the sector. In the absence of disruptive events, the sector reasserted the liberalisation of the retail market and a growth in the number of suppliers, an expansion of the capacity to generate electricity from renewable energy sources and a predominantly renewable generation mix, a reduction of the tariff debt and the progressive dissemination of innovation in electricity networks, its generation and its use.

In the natural gas sector, 2016 was a year marked by moderate growth in consumption (mainly for use in the generation of electricity), further expansion of the liberalised market and regulatory harmonisation with Spain and Europe. The latter changes, with an immediate and significant impact on the activity of the natural gas market agents, will only become visible to end consumers in the future, as that harmonisation results in an increase in the number of active agents in the market and in an increase in the number of commercial natural gas exchanges.

Liberalised electricity and natural gas markets

At the end of 2016, the liberalised electricity market had attracted more than 92% of total consumption and more than 4.7 million consumers. In the case of natural gas, and except for electricity-generating plants, nearly 96% of the consumption is in the liberalised market. Another important indicator is the annual supplier switching rate. In the electricity sector, this indicator is 21% (mostly among customers who are already in the market), while in the gas sector it is approximately 20%. Except for a few occasional shifts, market shares in trading have remained stable. We can say that the liberalised electricity market is going through a stabilisation phase.

Changes to the social tariff scheme for vulnerable consumers

At the end of the first quarter of 2016, Law no. 7-A/2016 of 30 March, changed the legal social tariff scheme for vulnerable customers and, as a result, customer eligibility is now automatically determined based on data from the distribution network operators, the Social Security and the Tax and Customs Authority, centralised at the Directorate-General for Energy and Geology (DGEG). This new procedure, which superseded the previous scheme based on customer requests, resulted in a significant increase in the number of customers with access to the social tariff. At the end of 2016, the social tariffs for electricity and natural gas covered more than 800,000 customers.

The current scheme for the application of social tariffs for electricity and natural gas provides that the support shall depend on the economic vulnerability of the contract holders, as proven by their enrolment in a series of social support programmes or by the existence of *per capita* family incomes lower than an

established threshold (only in the case of the electricity social tariff). Eligibility is automatically verified by the entities involved and reported to the suppliers who, in turn, must apply the social tariff.

Wholesale electricity market

The functioning of the wholesale electricity market was market by continuity, witnessing particularities associated with special hydrological characteristics. The Portuguese and Spanish power generation capacity have differences that have resulted in a reversal of the historical direction of commercial flows, as 2016 was a year of exports in the Portuguese area of the MIBEL. The high hydrological index also led to an increase in the number of market splitting hours between the Portuguese and the Spanish areas, increasing the absolute price *spread*, as compared to 2015.

2016 was a favourable year for generation technologies based on renewable energies, resulting in less greenhouse gas emissions and in 57% of renewable content (in the generation *mix*). The year was notable for a one off 4-day event in which the renewable energy sources were particularly important for the electricity sector. For 107 consecutive hours, Mainland Portugal's electricity sector was supplied exclusively by solar, water and wind power. Between 6:45 a.m. on 7 May and 5:45 p.m. on 11 May 2016, Mainland Portugal was able to supply its electricity network with zero carbon energy.

The power generation capacity was strengthened with new hydropower plants, following the implementation of a national programme for the promotion of hydroelectric use. As for planned investments in electricity generation, we highlight the continued development of hydroelectric generation, as well as of smaller projects for wind and solar photovoltaic use.

Wholesale natural gas market

The prices of natural gas in international markets allowed 2016 to be a relatively stable year, supported by a reference price lower than those of previous years, enabling a decrease in retail prices. The wholesale price *spread* between Asia and Europe was almost cancelled out in 2016, shifting liquefied natural gas (LNG) deliveries to markets with higher prices. The year was also marked by the first consignment of LNG sent from the United States to Europe, which was unloaded at the Sines Terminal. Natural gas prices in the American *hub* are still significantly lower than European prices.

Meanwhile, the Iberian natural gas market took its first steps, following the launch of the market platform in December 2015. The Portuguese and Spanish regulators worked together with the market operator in order to ensure that the rules allow the trading of natural gas in the two national systems and between them.

Also at the regulatory level, we highlight the adoption of the transmission network balancing code, which changed the balancing procedures as of October 2016, resulting in a significant European harmonisation

of the functioning of the natural gas market. This issue was one of the main topics covered in the review of the regulations on the natural gas sector, carried out by the regulator in 2016.

3 ELECTRICITY MARKET

3.1 NETWORK REGULATION

3.1.1 TECHNICAL FUNCTIONING

3.1.1.1 BALANCING

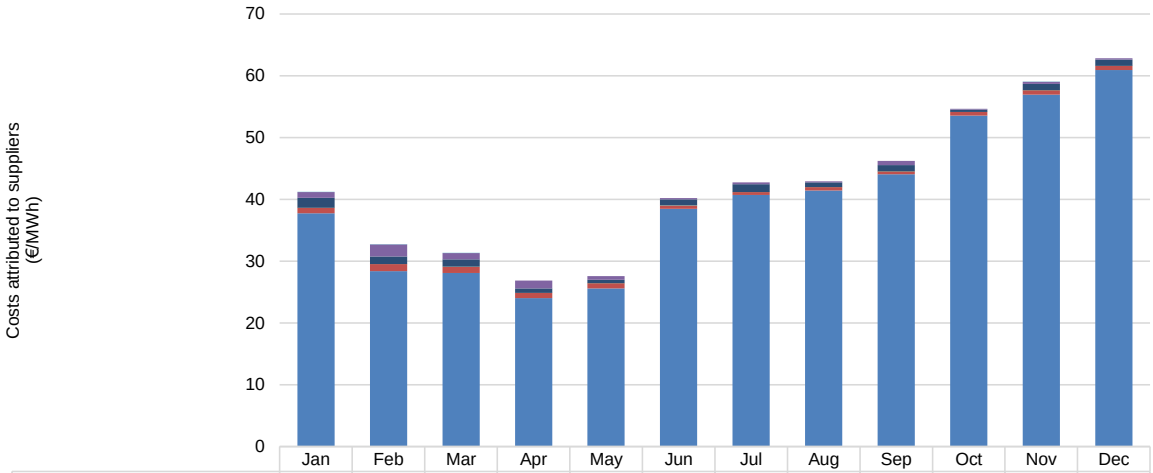
The imbalances between production and demand and the technical constraints are dealt within the scope of the ancillary services market, which is managed by REN due to its role of Global Technical System Manager.

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 secondary regulation reserve and regulating reserve energy mobilisation, for each hourly period, 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 daily, intraday and ancillary services market on the costs allocated to demand in 2016, including the breakdown of daily and intraday market share and of the ancillary services market.

Figure 3-1 also allows observing that the price of the ancillary services market was higher in the 1st quarter, which can be explained with a higher volatility in generation, particularly due to a strong wind component (wind index higher than 1).

Figure 3-1 - Impact of daily, intraday and ancillary services markets on the costs allocated to suppliers operating in Portugal, in 2016



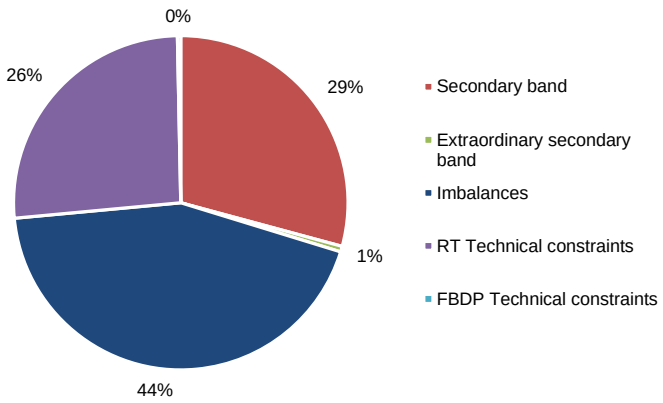
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Total ancillary services markets	3.47	4.36	3.25	2.86	2.01	1.72	2.00	1.47	2.18	1.13	2.07	1.91
FBDP Technical constraints	0.01	0.03	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RT Technical constraints	0.96	1.97	1.03	1.25	0.60	0.21	0.27	0.15	0.67	0.15	0.32	0.20
Imbalances	1.58	1.20	1.19	0.75	0.55	0.97	1.26	0.76	1.02	0.36	1.03	1.03
Extraordinary secondary band	0.02	0.02	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.02	0.02
Secondary band	0.90	1.15	0.97	0.85	0.85	0.52	0.45	0.55	0.49	0.60	0.70	0.67
Daily and Intraday Market	37.74	28.38	28.11	24.00	25.58	38.48	40.73	41.43	44.04	53.54	56.94	60.92

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

The ancillary services market represented, in 2016, a weighted average cost of approximately 2.37 €/MWh, against a weighted marginal price in the daily and intraday markets of approximately 39.99 €/MWh, which reflects a reduction in the average market price of nearly 20% compared to the previous year, contrasting with the average cost of the ancillary services market, which increased by 20%.

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

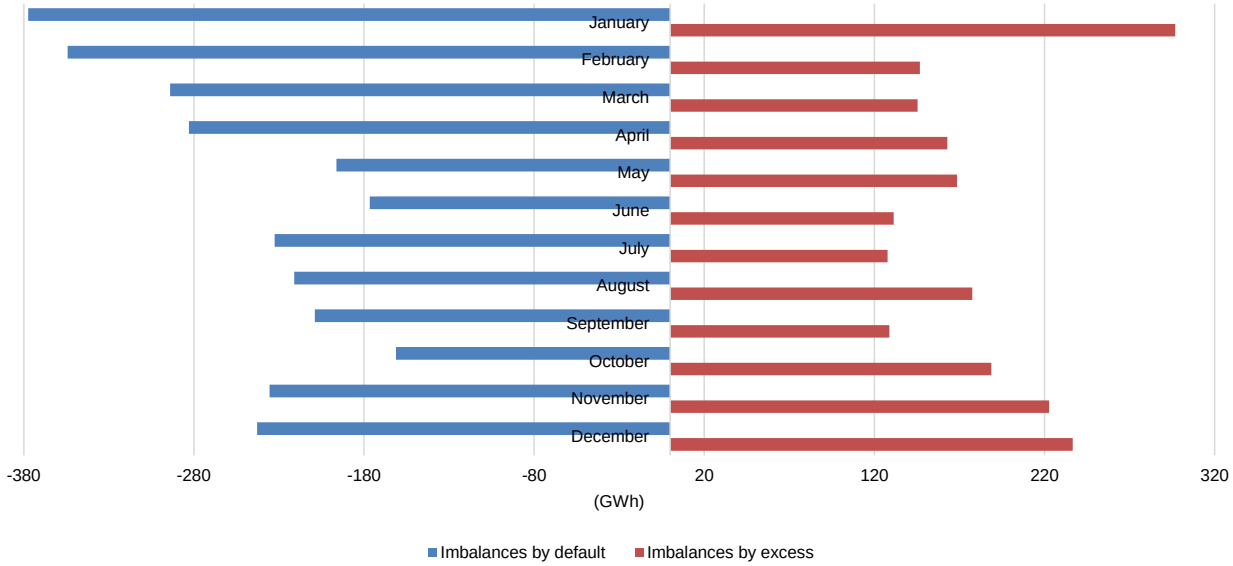
Figure 3-2 - Breakdown of the ancillary services market costs, 2016



Source: REN data

The monetary value of imbalances for each hour corresponds to the variable costs of regulation, which is paid to the agents that rectify the imbalance by participating in the ancillary services market. shows the evolution of imbalance energies, by excess and by default, observed throughout 2016. Compared to 2015, there was a significant increase in imbalances by default.

Figure 3-3- Evolution of imbalances, 2016



Source: REN data

The audit to the secondary regulation band market, determined pursuant to article 5 of Order no. 4694/2014 of 1 April, was completed in 2016.

This audit was aimed at identifying the risk of overcompensation in the method used for calculating the revisibility of CMEC contracts, with regard to the participation in the ancillary services market, that has generated, or might generate, a distortion of competition in that market, in light of the legal and procedural framework in force at the time, and to the assessment of the efficacy of Order no. 4694/2014 for the correction of distortions of competition identified in that market.

The findings of the audit mention the existence of signs of behavioural imbalances by a producer market agent, leading also to the existence of an economic overcompensation within the scope of the revisibility mechanism provided for in CMEC contracts.

The audit demonstrated that the principles of secondary regulation band price setting and proportionality of the quantities offered by the CMEC plants provided for in articles 2 and 4 of Order no. 4694/2014 of 1 April, worked well when it came to getting closer to the efficient behaviours adopted by the agents involved in the secondary regulation band market.

3.1.1.2 TECHNICAL QUALITY OF SUPPLY

In Mainland Portugal, both the Quality of Supply Code (RQS)[1]and the Tariff Code (RT)[2] include provisions for regulating the continuity of supply.[3].

CONTINUITY OF SUPPLY

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

We should refer that, with the entry into force of the RQS, on 1 January 2014, the performance assessment of the transmission and distribution network in terms of continuity of supply, in addition to long interruptions (longer than 3 minutes), is now considering short interruptions (between 1 second and 3 minutes), through the MAIFI indicator.

Table 3-1 shows the figures for the continuity of supply indicators for Mainland Portugal in 2016[4].

[1] Regulation no. 455/2013 of 29 November, which approves the Quality of Supply Code for the electricity sector and the corresponding Procedure Manual. Complemented by Directive no. 20/2013, which approves the Parameters for Quality of Supply Regulation and Directive no. 21/2013, which approves the deadlines for the classification of Exceptional Events and for the provision of information to ERSE.

[2] Regulation no. 551/2014 of 15 December 2014, which approves the Tariff Code for the electricity sector.

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

[4] The information regarding the historical evolution of the indicators of continuity of supply is available at:
http://www.erse.pt/pt/electricidade/qualidadedeservico/relatoriodaqualidadedeservico/

Table 3-1 - Continuity of supply indicators in Mainland Portugal, 2016

Voltage Level	Indicator	Interruptions		
		Planned	Unplanned	
			Operator Responsibility	Exceptional Events
Transmission	TIE (min)	-	0.116	0.22
	SAIFI (int)	-	0.025	0.013
	SAIDI (min)	-	0.111	0.168
	MAIFI (int)	-	0.038	-
HV Distribution	SAIFI (int)	0.004	0.273	0.016
	SAIDI (min)	0.408	109.719	3.674
	MAIFI (int)	-	1.463	0.012
MV Distribution	TIEPI (min)	0.086	49.897	9.063
	SAIFI (int)	0.002	1.682	0.257
	SAIDI (min)	0.157	71.199	16.453
	MAIFI (int)	0.019	10.333	0.261
LV Distribution	SAIFI (int)	0.010	1.451	0.187
	SAIDI (min)	1.912	64.084	11.658

Source: REN and EDP Distribuição data

Overall, in 2016, the continuity of supply indicators, which assess the performance of the transmission and distribution networks, continued to follow the trend observed in the previous year.

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 compensation[5] without the need for the customer to request it. In 2016, there were 32,523 non-compliances, 31,949 of which were related to the duration of the interruptions and 574 to the number of interruptions, the largest share of which was related to non-compliances that affected standard low voltage (StLV) customers (541); customers received 322,000 euros in compensations. In 2015, there were 21,910 non-compliances, 21,906 of which were related to the duration of the interruptions and 4 to the number of interruptions; customers received 241,000 euros in compensations for failure to comply with these indicators.

In May 2016, ERSE organised a seminar dedicated to the technical quality of supply in the electricity sector, which included the launch of the "Selo de Qualidade e+" [e+ Quality Stamp] initiative, whose purpose is to

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

value the measures aimed at improving quality of supply implemented by the managers of business and industrial parks that join the initiative. At a first stage, this initiative will involve a series of pilot cases and, then, there will be an assessment of the possibility of expanding it to the other business and industrial parks that are interested in joining in. ERSE will be the entity responsible for managing and issuing the "Selo de Qualidade e+", together with the Directorate-General for Energy and Geology (DGEG) and the Agency for Competitiveness and Innovation (IAPMEI).

It should be noted that, in accordance with the RQS for the electricity sector, ERSE publishes a quality of supply report on a yearly basis[6], to characterise 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 the 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, at encouraging the improvement of the continuity of supply level among 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 Directive no. 20/2014 of 23 October; in 2016; the maximum value of the premium or penalty corresponded to 4 million euros. The determination of the value of non-distributed energy excludes interruptions justified for safety reasons, interruptions related to the national transmission network, as well as interruptions classified by ERSE as Exceptional Events.[7].

In 2016, the value of non-distributed energy was lower than the reference value set for the regulatory period, and the incentive received by the National Distribution Network (RND) operator represented approximately 2.7 million euros. We should note that this value showed an increase compared to the previous year (2.2 million euros), due to an improved quality of supply performance.

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[6] Available at

http://www.erse.pt/pt/electricidade/qualidadedeservico/relatoriodaqualidadedeservico/

[7] 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;
- 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.

"Component 2" was introduced in the 2014 regulatory amendment, and applied for the first time to the network's performance in 2016. 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 the 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 Directive no. 20/2014 of 23 October; in 2016; the maximum value of the premium or penalty corresponded to 1 million euros. The determination of the SAIDI MV value that covers the 5% of Distribution Transformer Stations and MV Customers excludes interruptions classified by ERSE as Exceptional Events.

In 2016, the SAIDI MV value that covers the 5% of Distribution Transformer Stations and MV Customers was lower than the reference value set for the regulatory period, and the incentive paid to the RND operator amounted to 1 million euros. In 2015, the incentive paid to the RND operator also amounted to 1 million euros.

3.1.1.3 CONNECTIONS TO NETWORKS

The regulatory framework for the commercial conditions governing connections to the network includes, among others, the following aspects:

- Mandatory connection to the network;
- Type of charges that can be levied;
- Rules for calculating network connection charges;
- Budget content and submission deadlines;
- Terms for connection charge payment;
- Construction of the network connection elements; and
- Provision of information.

Network operators are required to provide network connection to customers who request it in accordance with the commercial conditions approved by ERSE. Electrical installations cannot be connected to networks without the prior issuance of a licence or authorisation by the relevant administrative bodies.

Generically, networks are paid by electricity consumers as follows:

- Network connection charges in accordance with the rules approved by ERSE.
- Network use charges, which constitute a portion of the electricity bill. Costs borne by applicants, by way of contribution, do not integrate the regulated network use charges.

Trading conditions include incentives for the appropriate economic signalling of the costs of the installation being connected to the network (the further away from the network, the higher the co-funding), they promote

an efficient allocation of resources, particularly in terms of the requested power (the higher the requested power, the higher the costs to be borne by the requesters) and are based on rules that are simple and easy to apply, in order to ensure that requesters fully understand the connection charges, thereby reducing the level of conflicts in the sector.

The physical infrastructures that allow connecting an electrical installation to the network are considered network connection elements, and are classified into the following two types:

- Connection elements for exclusive use - part of the connection expected to exclusively transmit electricity generated or consumed at the installation in question (it has been established that it corresponds to the closest section of the connection between the consumer's installation up to the full length of 30 metres, as approved by ERSE).
- Connection elements for shared use - part of the connection through which electricity may travel to power more than one installation (corresponds, in LV, to the length that exceeds the maximum length of the connection element for exclusive use).

The network operator may choose to oversize the connecting element for shared use, without any cost to the requester, so that it may be used for powering other installations in the future. In MV networks, connection elements are all intended for shared use.

The person or entity that applies for a connection is responsible for building the sections intended for its exclusive use, and the distribution system operator (DSO) is not required to present a budget. However, in geographic areas where there are no service providers, the DSO must submit a budget and handle the construction of the connection.

Once built, the connection elements become an integral part of the networks (whose maintenance is the responsibility of the DSO, under the concession agreement) as soon as they are considered by the operator as having all the technical conditions for operation.

Network operators must send ERSE the data related to their activity in this area.

The current regulatory framework does not establish deadlines for the construction of connections to electricity networks. However, for monitoring purposes, the distribution and transmission network operators are required to provide ERSE with annual information regarding connections to electricity networks, which includes, among other aspects, the average execution time of connections made by the network operators. In 2016, the average execution time in the distribution network for the LV and MV levels was approximately 23 days, for a total of 7,768 connections.

The rules are approved by ERSE following public consultations that involve all the stakeholders; there were no regulatory changes in 2016.

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 in charge of energy may take any necessary transitional and temporary safeguard measures[8].

In 2016, there were no incidents that required implementing safeguard measures.

Additionally, and as explained in the following chapter, under exceptional circumstances of operation of the National Electricity System, Order no. 8810/2015 of 10 August, provides that the system manager must send reduction orders to be complied with by the special regime generating plants connected to the RNT or to the RND.

[8] Article 33-B of Decree-Law no. 215-B/2012 of 8 October, which introduces the sixth amendment to Decree-Law no. 172/2006 of 23 August, and completes the transposition of Directive no. 2009/72/EC of the European Parliament and of the Council of 13 July, concerning common rules for the electricity internal market.

3.1.1.5 RENEWABLE ENERGY SOURCES

As part of the application of the European Directive on this matter[9], the concept of renewable energy sources is related, in Portugal, to special regime generation (SRG). This special regime includes generation of electricity such as cogeneration, generation from renewable and non-renewable endogenous resources, distributed generation and generation without the injection of power into the network.. Since 2012, the generation of electricity through renewable and non-renewable endogenous resources, not subject to a special legal regime is also considered to be special regime generation[10]. Therefore, the SRG concept now includes all renewable energy sources for generating electricity, including all hydropower generation.

Also as part of the SRG, we should mention Order no. 8810/2015 of 10 August, of the Directorate-General for Energy and Geology (DGEG)[11], 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 electrical power 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 2016, there were no power reductions under the scope of application of the aforementioned Order.

In Portugal, the energy generated by SRG, subject to a special legal regime, with guaranteed remuneration, must be bought by the Supplier of Last Resort (SLR), with the application of *feed in tariffs*)[12]. The differentiation of the remuneration of this SRG, in the current legal framework, depends on the generation technology.

The SLR selling price can be one of the following:

- The price resulting from the application of the tariff published by the Government;
- The price resulting from the bid submitted during tenders for the allocation of interconnection 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.

[9] Directive no. 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.

[10] Article 18(1) of Decree-Law no. 215-A/2012 of 8 October, which introduces the fifth amendment to Decree-Law no. 29/2006 of 15 February, amended by Decree-Laws no. 104/2010 of 29 September, 78/2011 of 20 June, 75/2012 of 26 March, and 112/2012 of 23 May, transposing Directive no. 2009/72/EC.

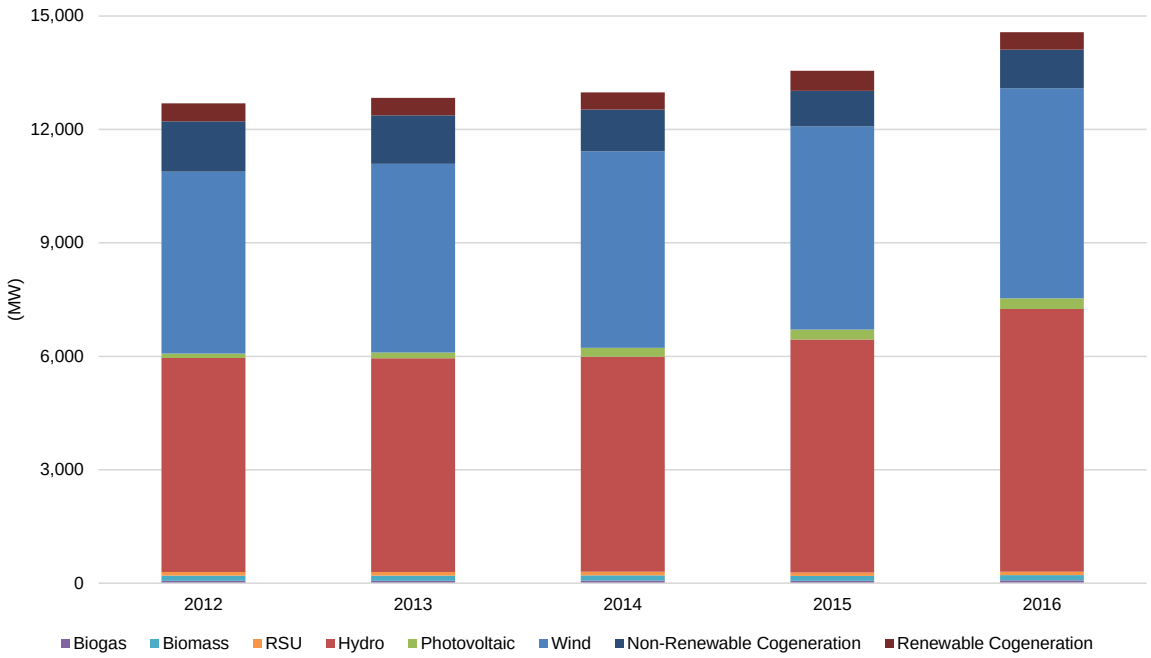
[11] Order no. 8810/2015 of 10 August, of the Directorate-General for Energy and Geology, which lays down the necessary rules and procedures to establish a discipline for the interruption of generation under the special scheme, namely the order and sequence of the power reduction to be complied with by the special-scheme generating plants connected to the RNT or the RND.

[12] Since the end of 2011, the LRS specifies the selling offer for the SRG in the MIBEL, working as bonding agent for the SRG in Portugal.

The prices published by the Government 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 (giving value to CO^2 emissions avoided), and also a logic of differentiation in accordance with the generation technology or primary source of energy used. Therefore, the remuneration of the producer depends on the period of delivery of electricity to the network and on the primary energy source that is used.

In 2016, the installed power of the SRG represented 75% of the total installed power of the Portuguese electricity system. From 2012 to 2016, this weight varied between 69 and 75%. Figure 3-4 shows the installed power of the SRG between 2012 and 2016, broken down by technology.

Figure 3-4 - Installed power of the SRG, 2012 to 2016

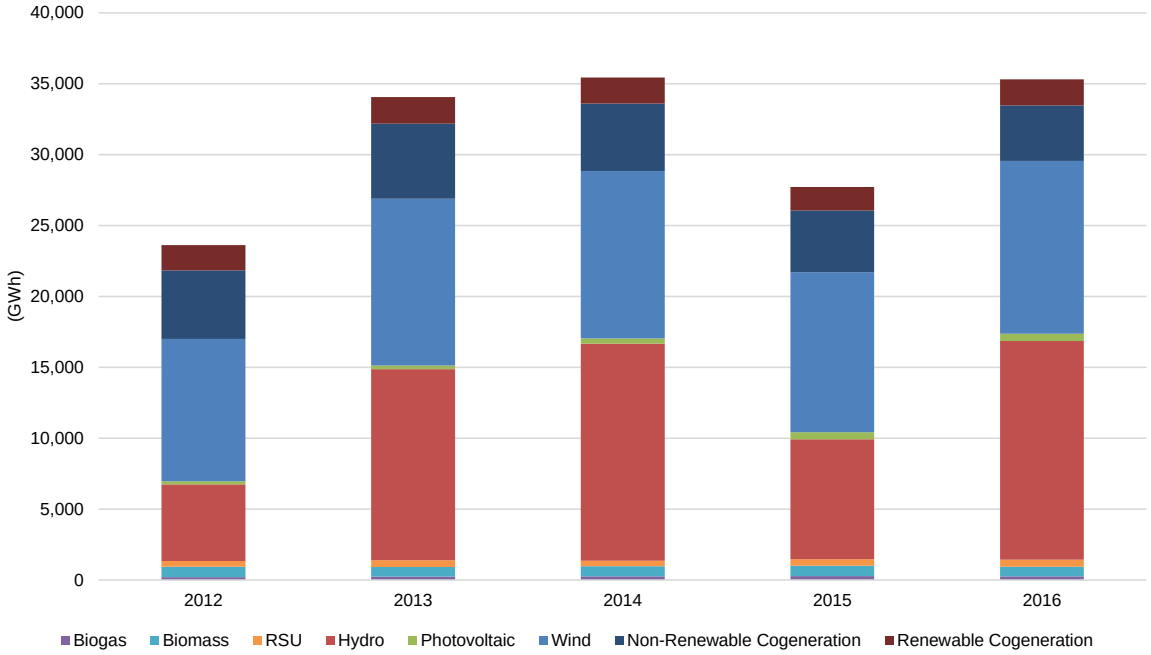


Source: REN data

Note: RSU means Solid Urban Waste

In terms of the electricity produced in 2016, approximately 35.3 TWh were generated by the SRG, representing 63% of the total energy produced, a figure that, between 2012 and 2016, varied between 56% and 72%. Figure 3-5 shows the evolution of the electricity produced by the SRG between 2012 and 2016, broken down by technology.

Figure 3-5 – Electricity produced by the SRG, 2012 to 2016



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

An analysis of the figures above shows the importance of the SRG and, particularly, of the renewable energy sources, for the Portuguese electricity system. A good example of that importance was observed between 6:45 a.m. on 8 May and 5:45 on 11 May 2016 (106 hours), a period in which the consumption of electricity in Mainland Portugal was fully ensured by renewable sources.

3.1.2 NETWORK TARIFFS FOR CONNECTION AND ACCESS

REGULATORY FRAMEWORK

The tariffs set for 2016 incorporate the rules approved following the 2014 regulatory review[13]. In 2016, there were no changes to the legislative framework reported in 2015.

ERSE is responsible for preparing and approving the Tariff Code, which establishes the methodology to be used for calculating tariffs, as well as the ways to regulate the allowed revenues. The approval of the Tariff Code is preceded by public consultation and by an opinion from the Tariff Board. ERSE's tariff fixing process, including its time frame, is also defined in the code.

[13] Regulation No. 551/2014 of 15 December.

PROCEDURES AND METHODOLOGY FOR CALCULATING ELECTRICITY NETWORK ACCESS TARIFFS

In 2016, the methodology for calculating electricity network access tariffs remained unchanged.

For the purpose of contextualising the tariff calculation methodology for the network access tariffs, a brief explanation of the current Portuguese tariff system is provided below.

Network access tariffs are charged to all electricity consumers for the use of the public service electricity network infrastructures. Generally speaking[14], these tariffs are paid by suppliers on behalf of their customers.

The revenue generated by regulated activities is recovered through specific tariffs, each with its own tariff structure and characterised by a given set of billing variables. The tariffs are the following: Global Use of the System, Use of the Transmission Network in Extra High Voltage (EHV) and HV and Use of the Distribution Networks in HV, MV and LV.

Tariff prices are established in each activity so as to ensure that their structure follows the structure of the marginal costs of the activity and also enables the recovery of the allowed revenues in each activity.

Tariff charging and billing are based on the principle of non-discrimination of the energy's end use. All tariff options are available to all consumers.

Network access paid by all electricity consumers includes the following tariffs: Global Use of the System, Use of the Transmission Network and Use of the Distribution Network. Access tariff prices for each billing variable are determined by adding up the corresponding tariff prices per activity.

Insofar as the tariffs making up this sum are based on marginal costs, cross subsidisation between consumers is avoided and an efficient use of resources is promoted.

This tariff calculation methodology allows for detailed knowledge of the various tariff components by activity or service. Therefore, each customer can know exactly how much they pay, for example, for the use of the MV distribution network, and how that amount is considered in terms of billing. This methodology allows for transparency in the way that costs and tariffs are determined by the regulator.

[14] 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.

NETWORK ACCESS TARIFF PRICES

The average price of network access tariffs for 2016[15] corresponds to a tariff increase of 6.2% between 2015 and 2016, and to the variations per voltage level presented in the following table.

Table 3-2 - Network access tariffs in 2016

	2015 Tariffs (average prices) €/kWh*	2016 Tariffs (average prices) €/kWh	Change
Network Access Tariffs	0.07481	0.07948	6.2%
Access to EHV Networks	0.02412	0.02548	5.6%
Access to HV Networks	0.02938	0.03104	5.6%
Access to MV Networks	0.05094	0.05380	5.6%
Access to SpLV Networks	0.08689	0.09176	5.6%
Access to StLV Networks	0.11564	0.12328	6.6%

* Application of 2015 tariffs to the demand forecast for 2016.

Source: ERSE Data

The variation in tariffs for 2016 resulted from a combination of different factors with opposite impacts, among which ERSE highlight:

a) The costs associated with the debt service of the National Electricity System (SEN) included in the 2016 tariffs show an increase of approximately 33% (corresponding to 437 million euros) compared to 2015, amounting to nearly 1.771 million euros. The growth of the service debt costs had a substantial impact on the increase of approximately 10% in the revenue recoverable via the Global Use of the System (GUoS) tariff, which alone accounts for approximately one third of the total revenue recoverable via the application of end customers' tariffs.

b) The efficiency targets applied to regulated activities have enabled a very consistent cost reduction, particularly in network related activities, i.e., the transmission and distribution of electricity. 2016 was the second year of application of the efficiency targets defined for the 2015-2017 regulatory period. As a result, the allowed revenues for regulated activities reflect the cost bases that, in 2015, were revised downwards in the case of most of the activities, contributing to a decrease in the operation costs recovered via the application of tariffs.

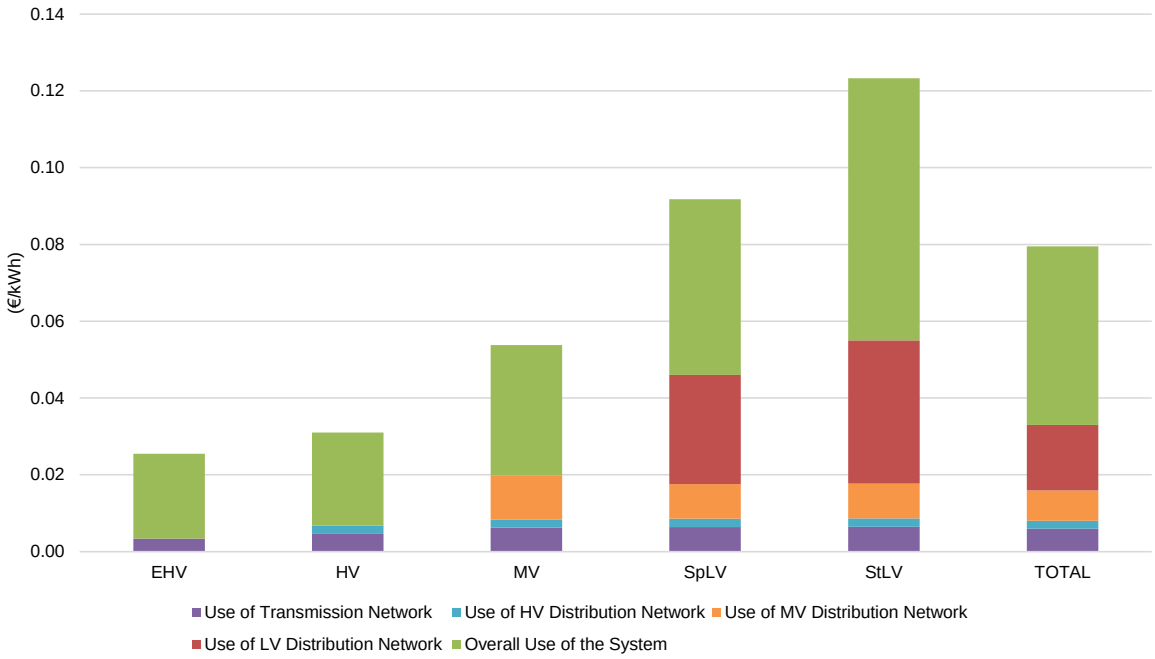
c) The prices of the electricity markets for 2016 implicit in the tariff exercise (the setting of tariffs is based on the price of the futures market) are lower than the values obtained in the previous year for the validity period of the 2015 tariffs, reflecting a sharp drop in the prices of fossil fuels that occurred in the last months of 2015. The projection of the price of electricity on the market is reflected in the network access

[15] In the amount of 0.0795 €/kWh.

tariffs in terms of costs arising from energy policy measures, namely in the extra costs of the SRG with guaranteed remunerated and in the cost differential related to the acquisition of energy from plants with energy acquisition contracts (CAEs).

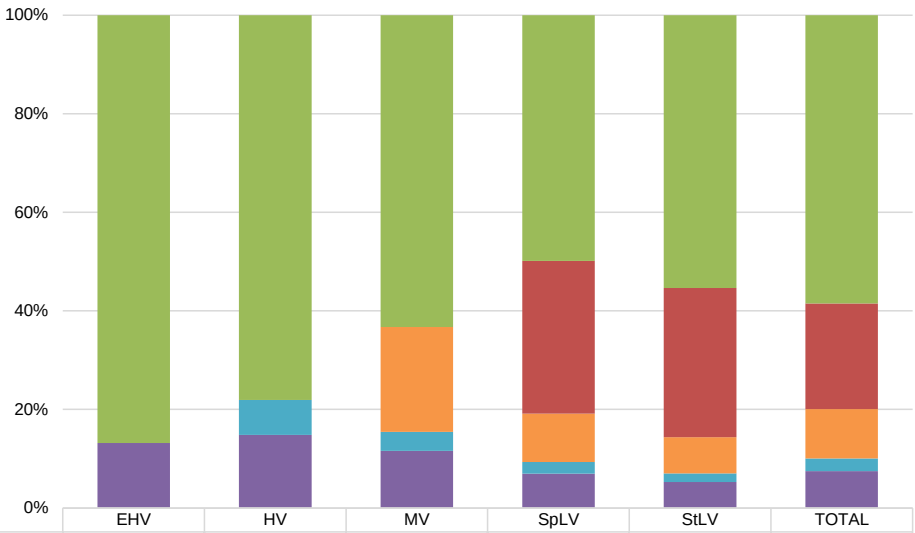
The figures below show, for each voltage level, the breakdown of the average price of the network access tariffs in 2016 by regulated activity and the structure of the average price for each voltage level by regulated activity.

Figure 3-6 - Breakdown per activity of the average price of network access tariffs in 2016



Source: ERSE Data

Figure 3-7 - Structure of the average price of network access tariffs by regulated activity per voltage level in 2016



	EHV	HV	MV	SpLV	StLV	TOTAL
Overall Use of the System	86.8%	78.1%	63.3%	49.9%	55.4%	58.5%
Use of LV Distribution Network				31.0%	30.3%	21.4%
Use of MV Distribution Network			21.3%	9.8%	7.3%	10.0%
Use of HV Distribution Network		7.1%	3.8%	2.4%	1.8%	2.6%
Use of Transmission Network	13.2%	14.8%	11.6%	7.0%	5.3%	7.5%

Source: ERSE Data

REGULATION METHODOLOGIES FOR DETERMINING ALLOWED REVENUE

2016 was the second year of the 2015-2017 regulation period. Next, there is a summary of the regulatory models in force for the current regulatory period by type of network operator and for Suppliers of Last Resorts:

- For Mainland Portugal:
    - Transmission system operator (TSO) - Model based on economic incentives: (i) application of a price cap16 methodology with efficiency targets for operating costs (OPEX17); (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 maintaining equipment in operation at the end of its useful life.

[16] *Operational expenditure*.

[17] 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 efficiency factor was set at 1.5%.

- Distribution network operator - Price cap methodology18 applied to unit operating costs (OPEX) and costs accepted on an annual basis in the case of investment costs19, taking into account the investment plans proposed by the companies. Other incentives also apply: (i) incentive for investment in smart networks20; (ii) incentive to improve service continuity and (iii) incentive to reduce losses;

- In the Autonomous Regions of the Azores and Madeira, companies with electricity transmission and distribution concessions are subject to a regulation based on economic incentives: (i) regulation of electricity purchase and management activities via a revenue cap methodology[21];(ii) regulation of the electricity distribution activity via a price cap methodology[22] 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 fuels[23].

In the 2015-2017 period, there was a change in the reference rate used to determine the cost of capital, which is now that of the *yields* of 10 year Treasury Bonds (instead of CDSs)[24]).

The allowed revenue for transmission and distribution network operators in what regards the overall management of the system, the purchase and sale of electricity from and to the commercial agent and the purchase and sale 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 Electricity Acquisition Contracts (CAEs). Two of these contracts remained in force, and the energy generated by those two plants is now managed by a trading company.

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

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[18] Return on net assets and amortisations.

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

[20] 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.

[21] 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 the Autonomous Region of the Azores, the efficiency targets applied to each of the activities vary between 2% for distribution and 3.5% for trading. In the Autonomous Region of Madeira, the efficiency targets are 4% and 3.5% for distribution and trading, respectively.

[22] Efficiency factor set at 3.5%.

[23] 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.

[24] *Credit Default Swaps*.

The remaining contracts 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 addition to those costs, there are other equally significant ones related to (i) the remuneration of the energy generated by renewable sources or cogeneration (SRG, except for large hydropower plants), determined administratively; (ii) the concession of rents paid by the distribution network operator to municipalities and (iii) compensations 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 2016, the Portuguese Parliament decided to extend the payment of considerations to the municipalities of the autonomous regions of Azores and Madeira by electricity distribution network operators, in similar terms to those defined in Mainland Portugal for concession revenues from the distribution of low voltage electricity.

NETWORK CONNECTION COSTS

Network connection rules and costs are described in section 3.1.1.3.

3.1.3 CROSS-BORDER ISSUES

In 2016, no significant changes were made to the management of the interconnections between Portugal and Spain, namely regarding the model for the daily and intraday capacity allocation, which was assigned exclusively to the MIBEL daily and intraday market, beyond the explicit use of the capacity through financial mechanisms to cover the risk for the interconnection use. Congestion is resolved through the application of a *market-splitting* mechanism.[25].

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:

- EC Regulation no. 714/2009 of the European Parliament and of the Council;
- Access to Networks and Interconnections Code;

[25] 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.

- Procedures Manual for the Joint Management Mechanism of the Portugal-Spain Interconnection;
- Joint Rules for Contracting Capacity in the Portugal-Spain Interconnection;
- Rules and principles for the harmonised allocation of financial rights for the use of interconnection capacity.
- Procedures Manual for Global Management System in the electricity sector.

2016 witnessed the publication of Commission Regulation (EU) 2016/1719 of 26 September, establishing a guideline on forward capacity allocation, and there were further developments aimed at the European implementation of Commission Regulation (EU) 2015/1222 of 24 July, establishing a guideline on capacity allocation and congestion management. These standards, in the process of implementation, will have a direct impact on cross-border issues.

REVENUE FROM CONGESTION ON INTERCONNECTIONS

According to the European legislation and regulation, congestion revenue may only be used to: 1) offset costs arising from coordinated balancing actions 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 transmission network tariff, if the revenue is not used for the two aforementioned purposes.

In 2016, 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 5 million euros (Table 3-3), a figure 4 times higher than the one registered in 2015 (1.2 million euros in 2015). This increase in revenues is the result of an increase in the number of hours in which the interconnection was congested and in which there were two different price zones.

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 each market, as well as the arithmetic price differential. The table also shows the monthly evolution of the congestion revenue and the energy associated with each of the interconnection directions.

This significant increase in the overall amount of revenue from congestion, as well as in the number of hours of market splitting, is associated with a growth in exports from Portugal to Spain (which results in a negative average price differential), associated with an increase in the generation of energy from renewable sources.

The total number of congestion hours tripled from 212 hours in 2015 to 720 hours in 2016. This total includes congestion in both directions of the interconnection.

In terms of the price differential, in 2016 there was a negative average *spread* of 0.23/MWh, in exports, compared to the spread of 0.10/MWh, for imports, in 2015.

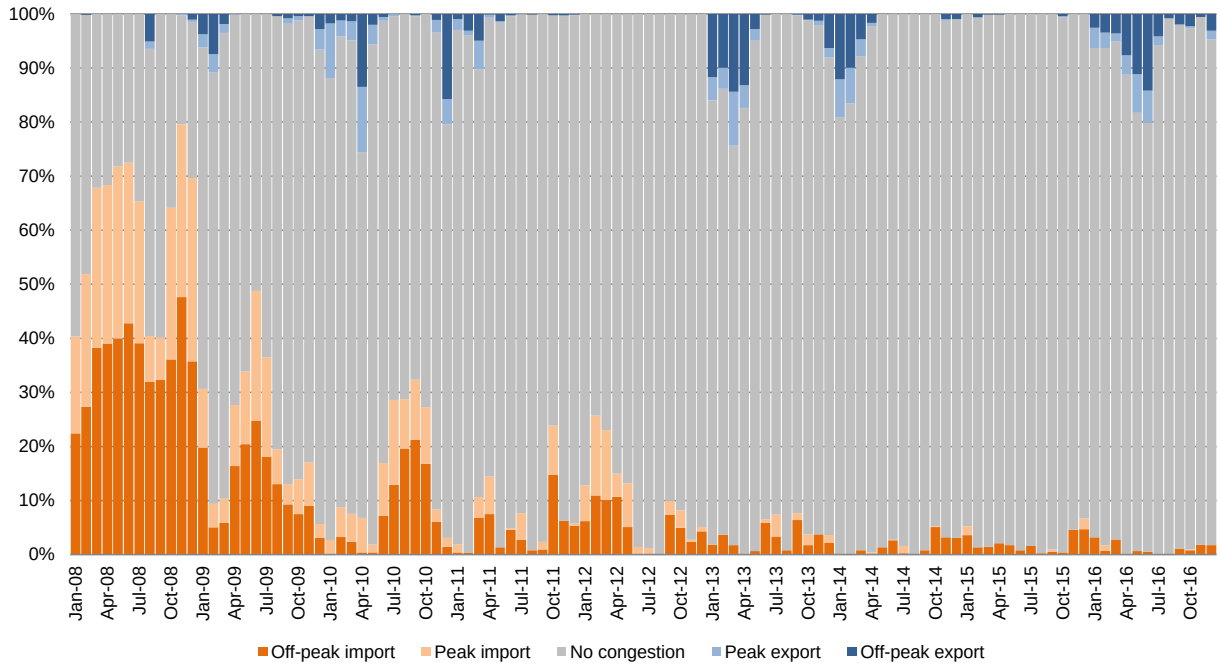
Table 3-3 - Monthly evolution of congestion revenue, 2016

Month	Congestion		Average Price PT	Average Price SP	Price differential	Import (PT < ES)	Export (PT > ES)	Congestion revenue (PT > ES)
	no. hours	% hours/month	(€/MWh)	(€/MWh)	(€/MWh)	(MWh)	(MWh)	10^3 €
January	71	10%	36.39	36.53	-0.14	85,001	915,372	781
February	56	8%	27.35	27.50	-0.15	43,866	1,044,394	570
March	59	8%	27.70	27.80	-0.11	219,206	486,771	399
April	81	11%	23.50	24.11	-0.61	80,797	713,359	758
May	141	19%	24.93	25.77	-0.83	101,267	672,894	1,043
June	149	21%	38.28	38.90	-0.62	93,295	448,354	467
July	43	6%	40.36	40.53	-0.16	231,355	288,968	178
August	6	1%	41.14	41.16	-0.02	118,134	361,191	25
September	22	3%	43.61	43.59	0.02	159,201	349,536	129
October	27	4%	52.78	52.83	-0.05	299,638	328,521	164
November	17	2%	56.25	56.13	0.12	217,166	474,940	33
December	48	6%	60.27	60.49	-0.21	248,399	466,429	405
								4951

Source: OMIE data

The figure below shows the use of the available capacity in both directions of the Portugal-Spain interconnection, and allows observing an increase in the number of hours of congestion in the exporting direction after 2015, a year in which there was virtually no congestion.

Figure 3-8 - Usage of the Portugal-Spain interconnection capacity, 2008 to 2016



Source: REN and OMIE data

COOPERATION

ERSE regularly cooperates with the other European regulators in the scope of CEER and ACER in the pursuit of 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 Europe[26] (CCR SWE), work is underway with a view to the successful European integration of the Iberian Electricity Market.

[26] ACER Decision no. 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.

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

The process for the harmonised allocation of financial transmission rights (FTR) concerning capacity in the Portugal - Spain interconnection, which results from the works 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, proceeded smoothly in 2016.

Throughout 2016, quarterly auctions were held for each direction of the interconnection, concerning the last 3 quarters of 2016 and the 1st quarter of 2017, as well as the annual auction for the year 2017. The auctions took place through a platform managed by OMIP[27], and all the rights that were offered were acquired.

In November 2016, ERSE approved the *Harmonized Allocation Rules* (HAR) concerning capacity in the European electrical interconnections, within the scope of the implementation of Commission Regulation (EU) 2016/1719 of 26 September 2016, establishing a guideline on forward capacity allocation, as well as the respective annex with specificities concerning the border between Portugal and Spain.

REGULATION RESERVE EXCHANGE MECHANISM BETWEEN TRANSMISSION NETWORK OPERATORS

The mechanism of Regulation Reserve (RR) exchange between transmission network operators, approved in 2014 within the scope of ACER's South-west regional initiatives, the MIBEL and the BALIT (Balancing Inter TSO) mechanism, concerning the exchange of RR between operators maintained a regular functioning throughout 2016.

Table 3-4 shows, for Portugal, the accumulated energy values (2016) of RR traded within the scope of the BALIT and its weight in the total RR[28]. The table shows also the number of hours in which the regulation reserve was activated in each of the directions and the respective (arithmetic) average prices.

[27] Iberian Market Operator -Portuguese Section.

[28] For example, 13% is the weight of the import energy mobilised by REN in REE against the total value of RR in 2016 (in Portugal).

Table 3-4 - Statistics on BALIT, 2016

	PT-SP Import	PT-SP Export
Energy (GWh)	177	37
No. activated hours	1,069	305
Weight of BALIT in the RR (%)	13	3
Average Price (€/MWh)	39	46

Source: REN data

The TERRE project ("*Trans European Replacement Reserves Exchanges*"), launched in 2013, showed significant developments in 2016. This project, which is an evolution of the BALIT, increased the number of countries involved and evolved from a model of bilateral exchanges between TSOs to a model of multilateral exchanges. In addition to REN, the TSOs involved in this pilot project are REE (Spain), RTE (France), the National Network (Great Britain), Swiss network (Switzerland) and TERNA (Italy).

TERRE is a voluntary pilot project that results from the implementation initiatives foreseen in the Network Codes. In the case of *Electricity Balancing*[29], TSOs are obliged to integrate a common European regulation platform sometime after its entry into force.

The design of the model proposed by the TSOs was discussed with the respective regulators and included a 1-month long public consultation and the participation of 22 stakeholders.

In 2016, the project reached the end of the design stage and, in September, the regulators sent a "*Common Opinion Paper*" to the TSOs approving the project's model, subject to the clarification of a number of subjects. At the end of the year, the TSOs prepared the documentation for the Specifications, approved by the regulators, in order to launch the process for the selection of the IT platform supplier in 2017.

NOMINATION OF THE APPOINTED ELECTRICITY MARKET OPERATOR

Article 4 of Regulation (EU) no. 2015/1222, which establishes a guideline on capacity allocation and congestion management, provides that, 4 months after the entry into force of the regulation, each Member State should have designated one, or more, Nominated Electricity Market Operator(s) (NEMOs).

In the Portuguese case, this entity was designated by the Government in accordance with the provisions included in the Santiago Agreement, as provided for in Parliament Resolution no. 23/2006, which approves

[29] Commission Regulation (EU) that establishes guidelines on electricity balancing.

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.

That agreement establishes that the entity designated as NEMO is the OMIE[30], responsible for managing the daily and intraday market, a fact that was reported to ACER in December 2015.

MONITORING OF INVESTMENTS MADE BY THE ELECTRICITY NETWORK OPERATORS

Development and investment plan for the electricity transmission network

In 2016 there were no relevant facts concerning this matter, as the plan that received a favourable opinion from ERSE at the beginning of 2014, approved by the Government member responsible for the area of energy in 2015, is currently being implemented.

As mentioned in last year's report, in 2015 the DGEG sent to ERSE the proposal for the Development and Investment Plan for the Electricity Transmission Networks concerning the 2016-2025 period (PDIRT-E 2015), prepared by the RNT operator, in order to obtain ERSE's opinion. At the beginning of 2016, ERSE launched a public consultation on the PDIRT-E 2015 proposal and, taking into account the result of that consultation, as well as the comments obtained following the consultations of the Advisory Board and the Tariff Board, ERSE analysed the PDIRT-E 2015 proposal and issued its opinion on it, drawing attention to a series of comments that should be taken into account in the preparation of future PDIRT proposals.

Among the comments included in ERSE's Opinion, we highlight the need for the RNT operator to change the PDIRT-E 2015 proposal. ERSE considered that the overall amount of investment of 1165 million euros planned for the period between 2016 and 2025 is inappropriate in view of the actual and planned evolution of consumption and the RNT use peak, as well as of the excellent quality of supply and the fact that the RNT has no structural constraints.

Development and investment plan for the electricity distribution networks

EDP Distribuição, S.A., as RND operator, submitted a proposal for the Development and Investment Plan for the Distribution Network concerning the 2015-2019 period (PDIRD-E 2014 proposal) to the DGEG. In turn, DGEG sent to ERSE the PDIRD-E 2016 proposal received, with the regulator being responsible, pursuant to the terms of article 40-A(5), for organising a public consultation on its content.

Also in 2016, within the scope of the competences that are legally attributed to it, ERSE submitted for public consultation, between 30 November and 20 January 2017, the PDIRD-E 2016 proposal, prepared by the RND operator, and issued its opinion on 13 March 2017.

[30] Iberian Energy Market Operator – Spanish Section, S.A.

3.2 PROMOTING COMPETITION

3.2.1 WHOLESALE MARKET

In 2016, an increase was observed in the level of concentration in the electricity market (due to a favourable hydrological conditions for hydropower generation by the incumbent) and, simultaneously, an increase in concentration in terms of the installed capacity. This situation, combined with a favourable wind regime and an increase in the external demand aimed at the Portuguese market, contributed to maintaining the level of participation of thermal power plants, compared to 2015, with a decrease in the energy generated by coal-fired power stations and an increase in the energy generated by combined-cycle natural gas power stations.

The increase in the level of concentration in terms of installed capacity of the EDP group was mainly influenced by the entry into operation of Frades II hydroelectric power plant.

With regard to trading in the liberalised market, and as in 2015, there was a decrease in concentration that resulted from a dispersion of the energy contracting tools, namely through the implementation of regulated mechanisms for the forward placement of SRG energy with guaranteed remuneration, which can be accessed by the suppliers.

In 2016, there were circumstantial factors that led to an increase in the price differential between MIBEL areas, namely a high hydrological index combined with an increase in the relative weight of the intermittent component of SRG with guaranteed remuneration in the consumption structure, which did not favour the integration of the two price areas; the Portuguese area had lower prices.

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 hydraulic conditions, 2016 was marked by a development that was more beneficial to the incumbent[31], whose installed hydro capacity was the greatest, leading to an increase in the global concentration of electricity generation. Consequently, a high level of concentration 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.

[31] The document "Dominant Operator - Methodology and Applications", by the 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 the MIBEL.

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

PRICES

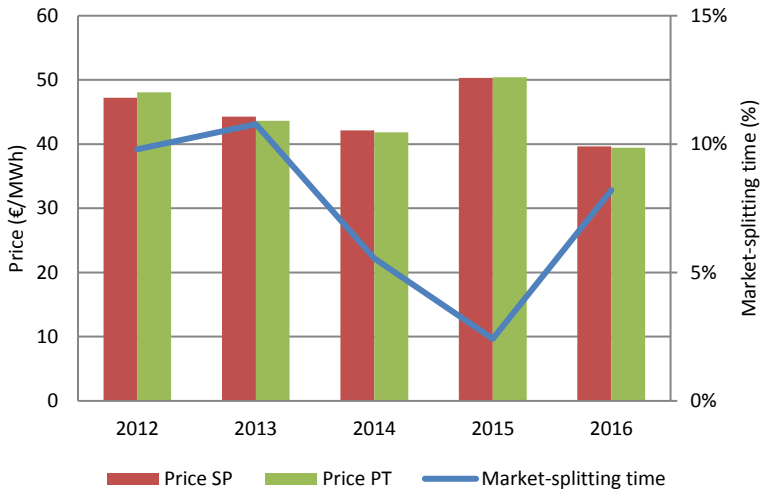
Spot market prices

The evolution of prices 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 in 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, both in Portugal and in Spain, is presented in Figure 3-9.

Figure 3-9 - Evolution of the average annual price in the *spot* market and market splitting, 2012 to 2016



Source: OMIE data

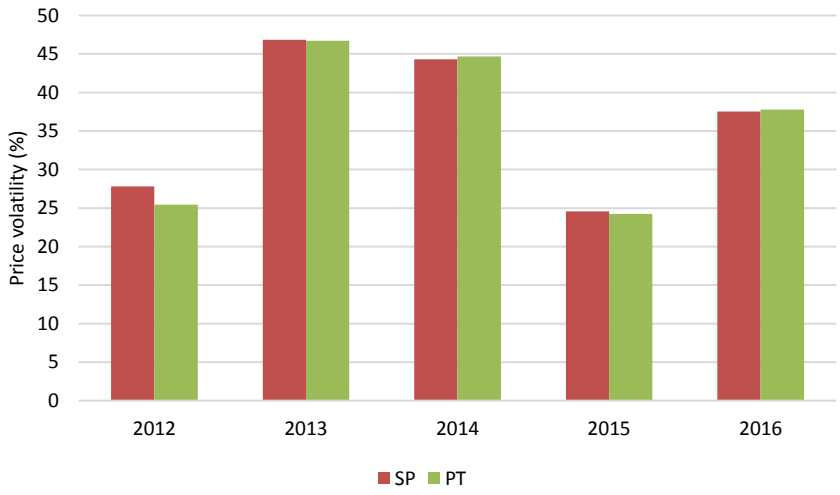
As can be seen from this figure, in 2016, the average price in the spot market for Portugal was 39.44 €/MWh, nearly 22% below the price recorded in 2015 (50.43 €/MWh). This variation was essentially a result of an increase in hydropower generation in 2016, which led to prices being less aligned with the marginal costs of the combined cycle natural gas thermoelectric power stations. In 2016, the average

market price in Portugal was approximately 10% above the marginal[32] 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 52% 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 2016, the volatility of the spot market price for Portugal, measured as the coefficient between the standard imbalance of prices in the year and the respective average price, was approximately 38%, which means prices ranged, on average, from €24/MWh to €54/MWh.

Figure 3-10 shows the evolution of the annual volatility of the spot market price, from 2012 to 2016, for both Portugal and Spain, with a significant increase in the volatility of the spot price between 2015 and 2016. This increase in volatility was mainly due to a growth in the contributions of hydroelectric generation and of the intermittent component of SRG with guaranteed remuneration in the consumption structure.

Figure 3-10 - Volatility of spot price, 2012 to 2016



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

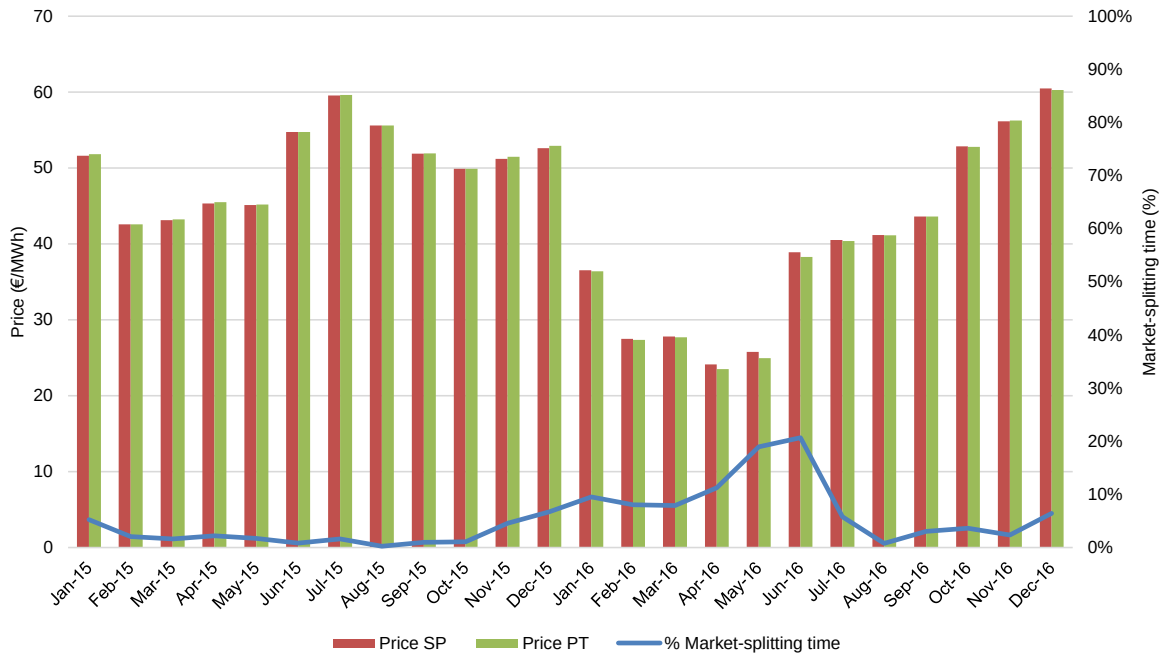
Figure 3-11 presents the evolution of prices in Portugal and Spain and the percentage of time that market splitting was applied, on a monthly basis, for 2015 and 2016. As regards 2016, we should highlight: (i) a reduction in the average price set in the market in 2016, compared to what had happened in 2015; (ii) the

[32] Estimated marginal cost calculated according to the methodology adopted by Directive no. 3/2017 disclosed 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.

existence of a more humid hydrological regime throughout the year; (iii) an increase in the number of market splitting hours compared to 2015.

Figure 3-11 - Spot market price and market splitting time, 2015 and 2016



Source: OMIE data

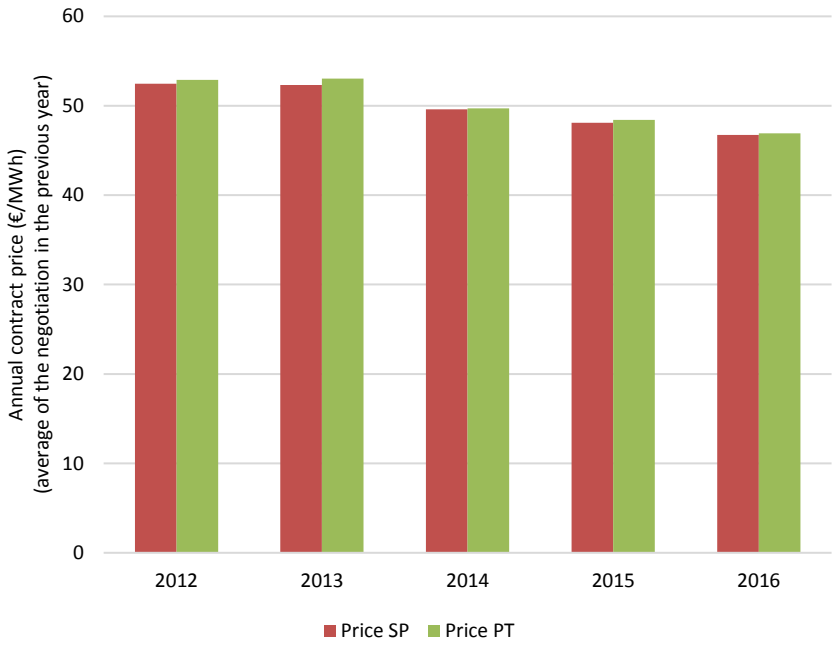
Forward market prices

The MIBEL operating model provides for the existence of references for forward contracting in an organised market, where agents can place part 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 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 75% of consumption is met through contracts made in this market referential. In this context, without an intrinsic problem of liquidity or depth of this market within the definition of the classic indicators used (number of transactions, market volume, dispersion of traded volumes), there is a growing need to cover the risks of fluctuating spot market prices, for which one of the most efficient and transparent answers will be the use of organised market platforms for forward contracting. In this case the market that was formally established within the scope of the agreement for the creation of the MIBEL (managed by the OMIP).

The evolution of the priced set in the forward market raised expectations of a slight reduction in prices between 2015 and 2016. The market agents who, in 2015, had acquired a position in the delivery contract with a base load for 2016 would have paid an average price (€46.92/MWh for Portugal[33]) about 19% higher than the price set in the spot market. Figure 3-12 presents the evolution of the average market closing prices related to the annual contract, in a base load delivery.

Figure 3-12 - Evolution of the average price for negotiating the annual futures contract (delivery in Portugal and in Spain), 2012 to 2016



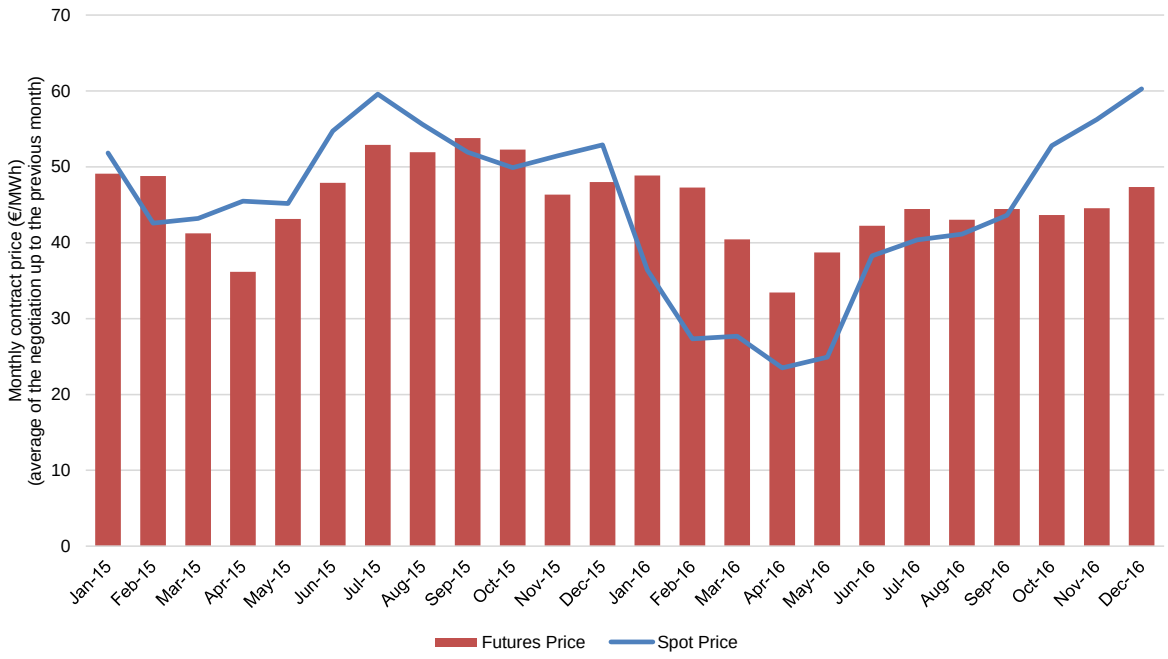
Source: OMIE data. Note: the average closing price for the year prior to delivery, for a base load delivery (e.g. the 2016 price corresponds to the average price set during 2015).

The evolution of the negotiation of monthly future contracts with a base load delivery showed an increase in the average risk premium in forward contracting from January to September (difference between the forward price and the *spot* price, for the corresponding month), showing a relative decline of expectations with regard for the price set on the spot market. The situation was more favourable in the other months, and there was no risk premium against the spot market. In these months, the agents that ensured that their needs in the forward market for each month were covered in advance got their average price risk in the spot market annulled.

[33] The value of the forward provisioning price reflects the average weighted value per contract volumes of shares of the 2016 annual contract with delivery in the Portuguese area of MIBEL, including the record of auction, continuous and *over-the-counter* (OTC) operations.

Figure 3-13 presents the evolution of monthly futures contract prices in the market managed by OMIP, and also the spot negotiation price, both for Portugal. The evolution of the forward price of monthly contracts showed, in average, a downward trend during the first quarter of 2016, a situation that was reversed from April onward.

Figure 3-13 - Evolution of the average price for negotiating the monthly futures contract (delivered in Portugal), 2015 and 2016



Source: OMIE and OMIP data

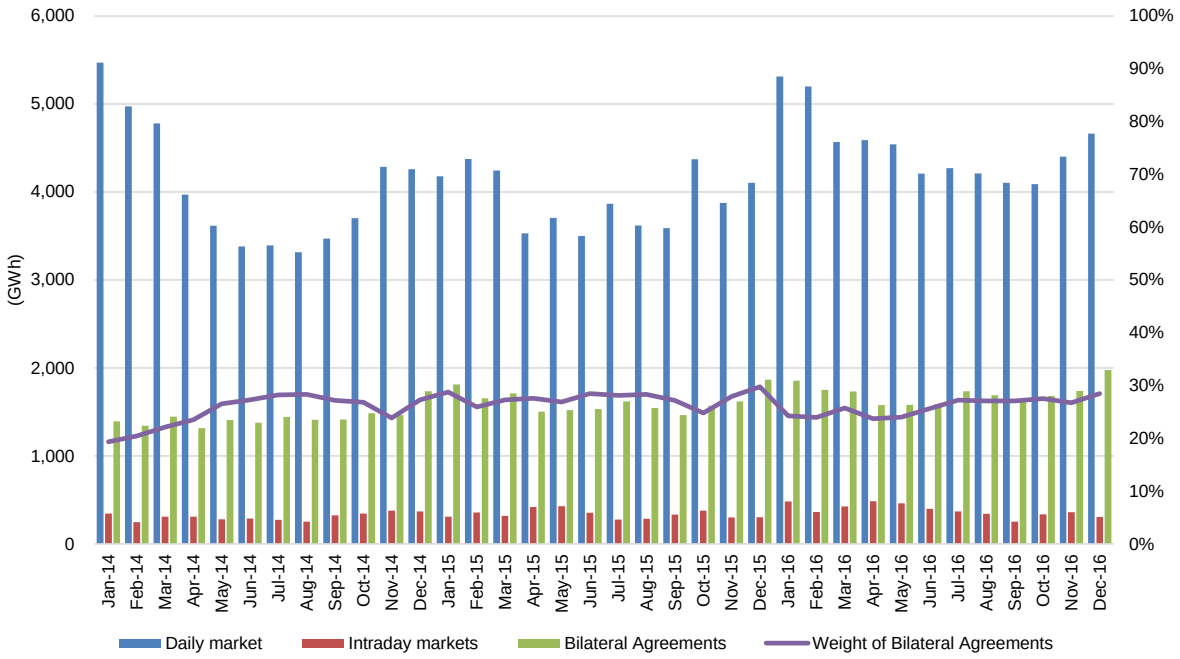
For 2016, as part of the application of the forward contracting mechanism for energy acquired from generators under a special regime, five guaranteed revenue SRG auctions were held, with the placement of a total of five distinct products (one annual base load and four quarterly base loads). These five auctions resulted in the placement of total hourly power output (volume placed) of 650 MW. The variation in volume was carried out in full by the modulation of quantity in the quarterly product (400 MW for each quarter) and in the annual product (250 MW). The volume of energy placed in this instrument corresponded to approximately 12% of national consumption.

The auctions held for delivery in 2016 ensured the full sale of the minimum volumes open for negotiation and allowed a stabilisation of the sale price for SRG energy. Furthermore, the existence of the auction mechanism provided risk coverage tools for the procurement of energy (in volume and in price) which were positively evaluated by the market agents.

Regarding spot market negotiation (daily and intraday markets), in the case of Portugal, it is much higher than the trading in bilateral contracts, as shown in Figure 3-14. 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 3-14- Breakdown of energy supply volumes between markets, 2014 to 2016



Source: OMIE and REN data

In 2016 there was a slight reduction in the average value of the weight of bilateral contracts compared to 2015, but there was an increase in the absolute value of bilateral contracts (increase of 6% equivalent to 1.1 TWh).

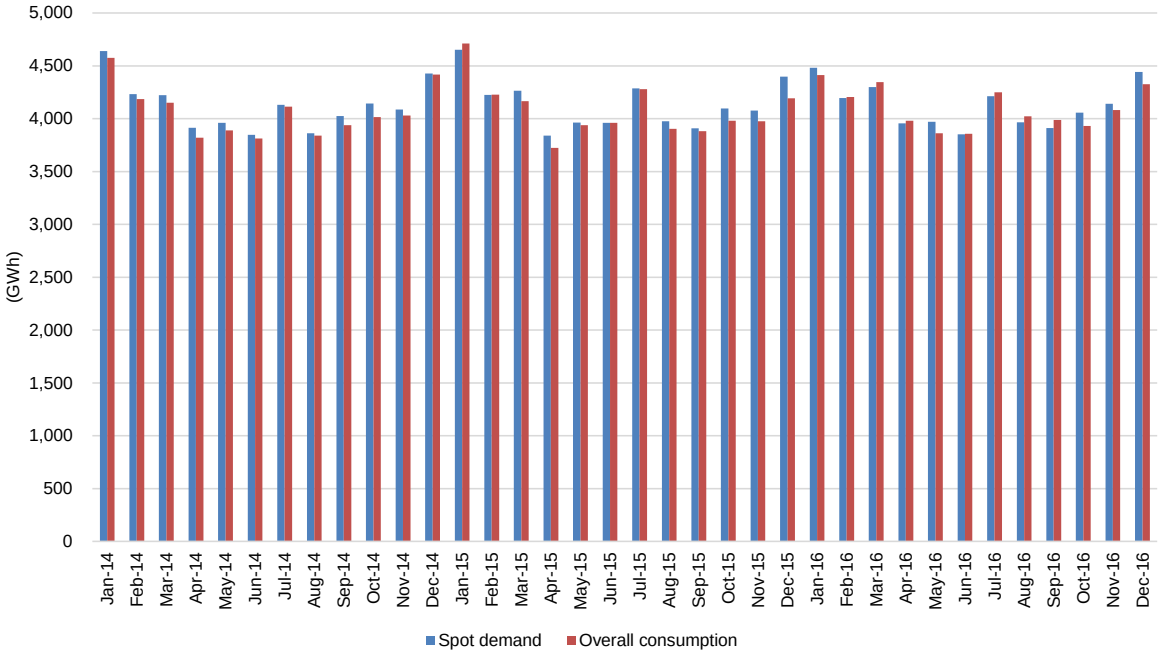
Spot contracting for the wholesale market in Portugal is part of the project to deepen MIBEL, i.e the single market for Portugal and Spain with an associated mechanism for resolving congestion on a daily basis, based on market splitting whenever the flow of electricity generated by aggregated demand and supply exceeds the commercial capacity available on the interconnection. The contracting structure in the spot market 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 -, which aggregates the expected generation and submits the offers to the market.

Market evolution

The evolution, both for spot market demand and overall consumption in mainland Portugal, is given in Figure 3-15, where it can be seen that consumption is met by acquiring energy on the spot market.

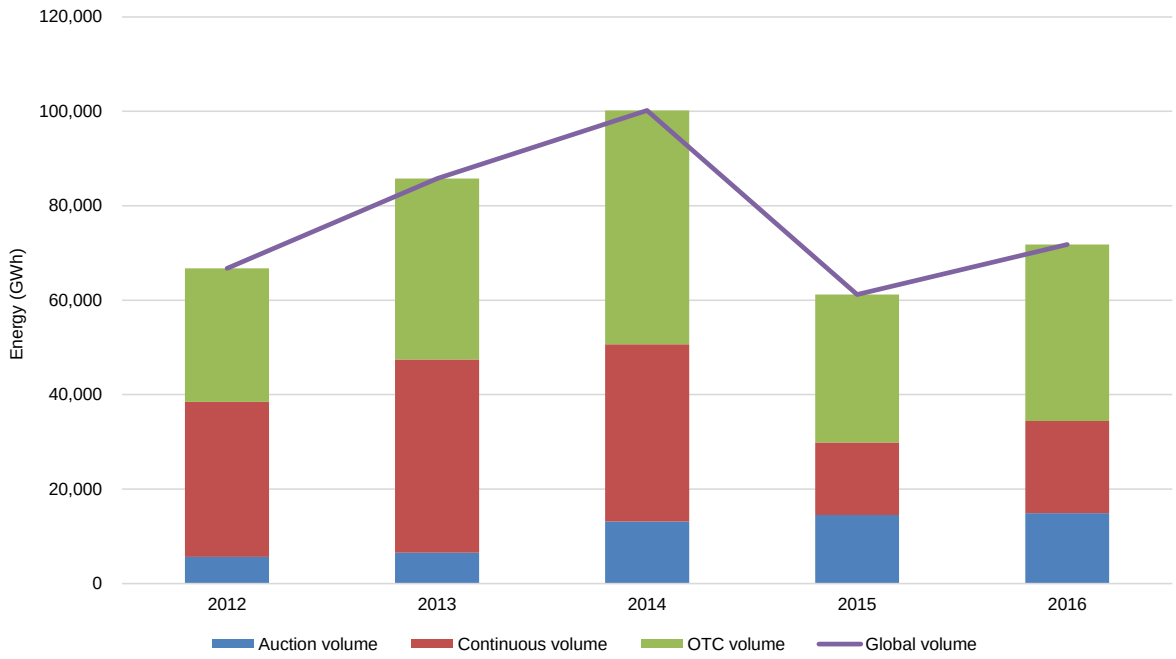
Figure 3-15- Spot market demand and total monthly consumption, 2014 to 2016



Source: OMIE data

Figure 3-16 shows the evolution of the volumes recorded in the organised forward market foreseen in MIBEL (OMIP), between 2012 and 2016, where there is a visible trend towards a significant increase of the overall trading until 2014, followed by a drop of 39% in the overall trading volume in 2015. In 2016 there is an overall growth of 17% in liquidity, mainly due to an increase in record of continuous and over-the-counter (OTC) transactions.

Figure 3-16 - Volumes in the MIBEL forward market, 2012 to 2016



Source: OMIP data

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

In 2016, the total trading volume in the forward market managed by the OMIP (including registered OTC transactions) was approximately 72 TWh. In comparison with 2015, there was an 18% increase in the total trading volume (corresponding to 11 TWh).

TRANSPARENCY

From a market monitoring point of view, it is important to consider the rules of transparency 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 was implemented nearly 6 years ago and are comparable to the requirement in the *Regulation on Wholesale Energy Market Integrity and Transparency*[34](REMIT) regarding to the obligation to report insider information.

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

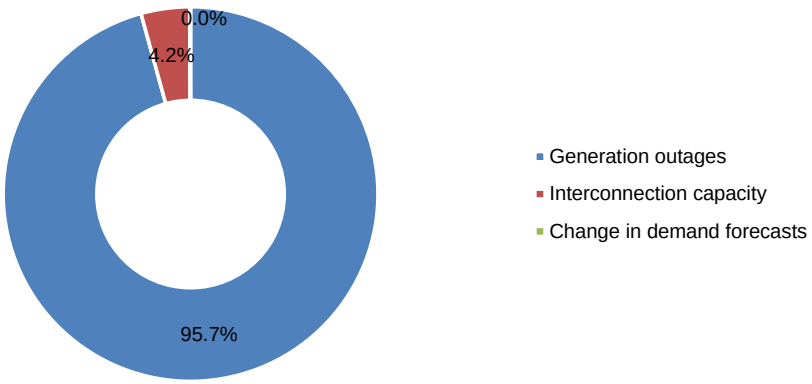
The reporting of transactions and trading orders associated with contracts negotiated in organised market platforms across the entire European Union began on 5 October 2015, in accordance with the schedule provided for in article 12 of the Commission Implementing Regulation (EU) no. 1348/2014 of 17 December, on data reporting, implementing Article 8(2) and Article 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 regarding the transmission of electricity concluded following an explicit primary capacity allocation by the transmission network operator and contracts negotiated outside the organised market platforms began on 7 April 2015 across the entire European Union, in accordance with the schedule laid down in article 12 of the Commission Implementing Regulation (EU) no. 1348/2014 of 17 December, on data reporting implementing Article 8(2) and Article 8(6) of the REMIT, as well as other relevant market information concerning the final assignments of electricity transmission capacity between bidding areas.

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

Insider information is communicated in a centralised manner, and is available on a portal managed by REN. During 2016, 4,012 relevant facts were communicated. Of these, approximately 96% concerned generation unavailability, and 4% to changes in the interconnection capacity available for the market and respective price setting in the context of MIBEL, as can be seen in Figure 3-17.

Figure 3-17 - Communication of relevant facts, 2016



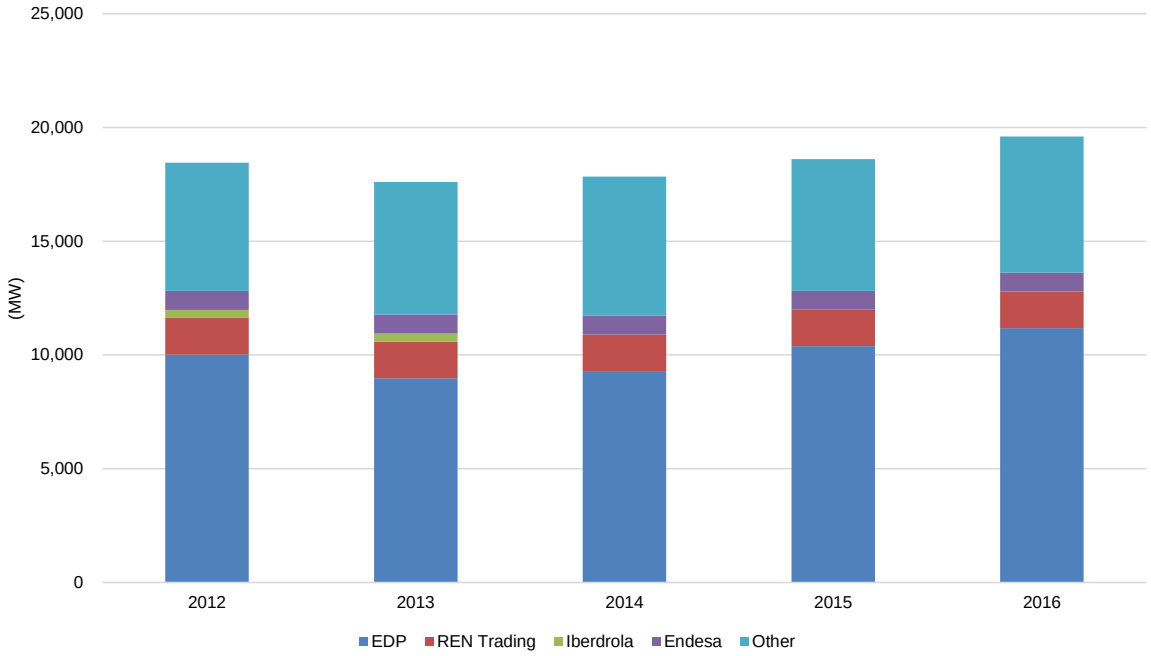
Source: REN data

COMPETITION EFFICIENCY

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

As a complement to the analysis of the breakdown of installed capacity by technology, it is important to characterise the breakdown of the installed power plant generation system by owning or managing company, developed in Figure 3-18, from which we can see that EDP group owns most of Portugal's installed capacity.

Figure 3-18 - Description of the electricity generation installed capacity in Portugal (by agent and installed capacity), 2012 to 2016



Source: REN data, EDP group. Note: "Other" includes all undertakings that hold SRG assets with guaranteed revenue.

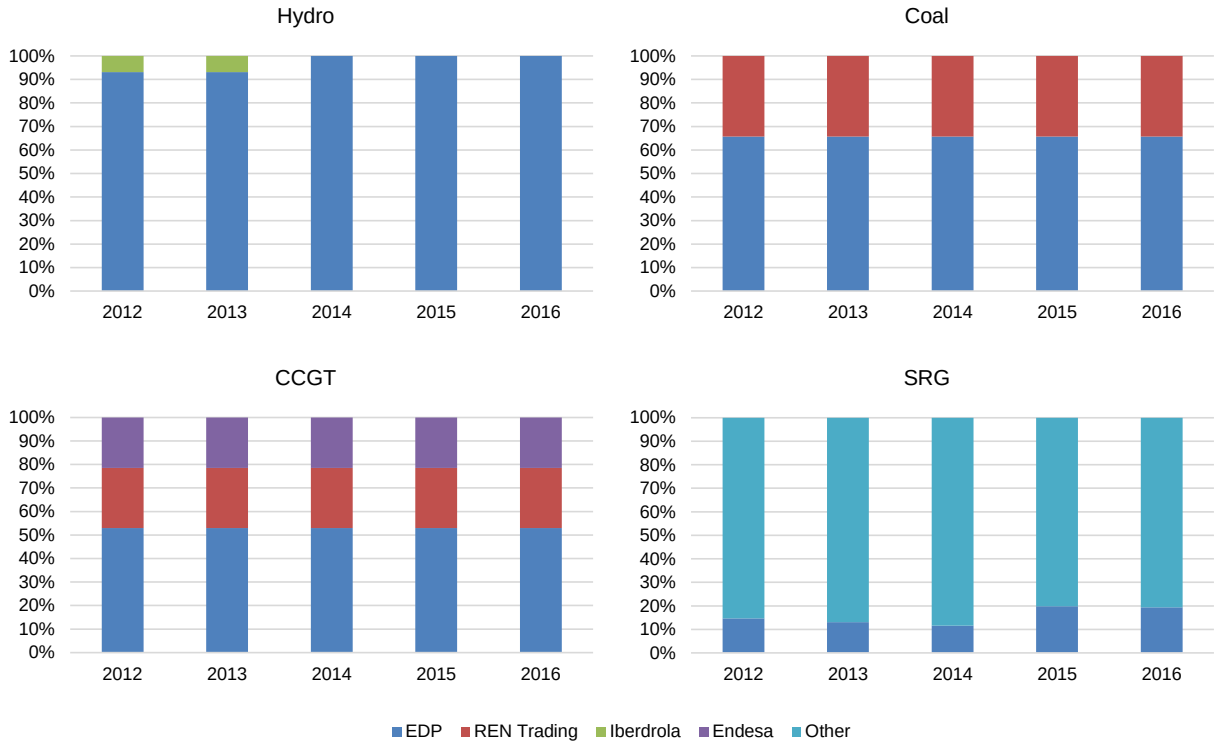
EDP Group's share of installed capacity showed a tendency to decrease until 2014, due to the decommissioning of the Carregado and Setúbal plants at the end of 2012, and also to the growth of the SRGs with guaranteed remuneration, in which EDP has a minority individual position. Additionally, we should mention the suspension, from 1 April 2014 onwards, of the measure to minimise competition risks implemented by the Competition Authority as part of the concentration operation that involved the acquisition by EDP of operation rights in the Alqueva and Pedrogão hydropower plants (EDIA). These rights determined the concession of the Aguieira/Raiva hydropower plant for a period of 5 years; Iberdrola was granted those operation rights via an international tender, a circumstance that had a residual impact on the growth of the EDP Group's share. Thus, following the tendency observed in 2015, in 2016 the EDP group

increase its market share due to the entry into operation of 780 MW of installed power in the Frades II hydroelectric power plant.

The review of the wholesale market also includes an evaluation of the 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 3-19. All the factors combined, the level of concentration of the electricity generation segment in Portugal is high in terms of installed capacity, as can be seen in Figure 3-20, which presents the values of the Hirschman-Herfindall Index (HHI[35]), which measures corporate concentration.

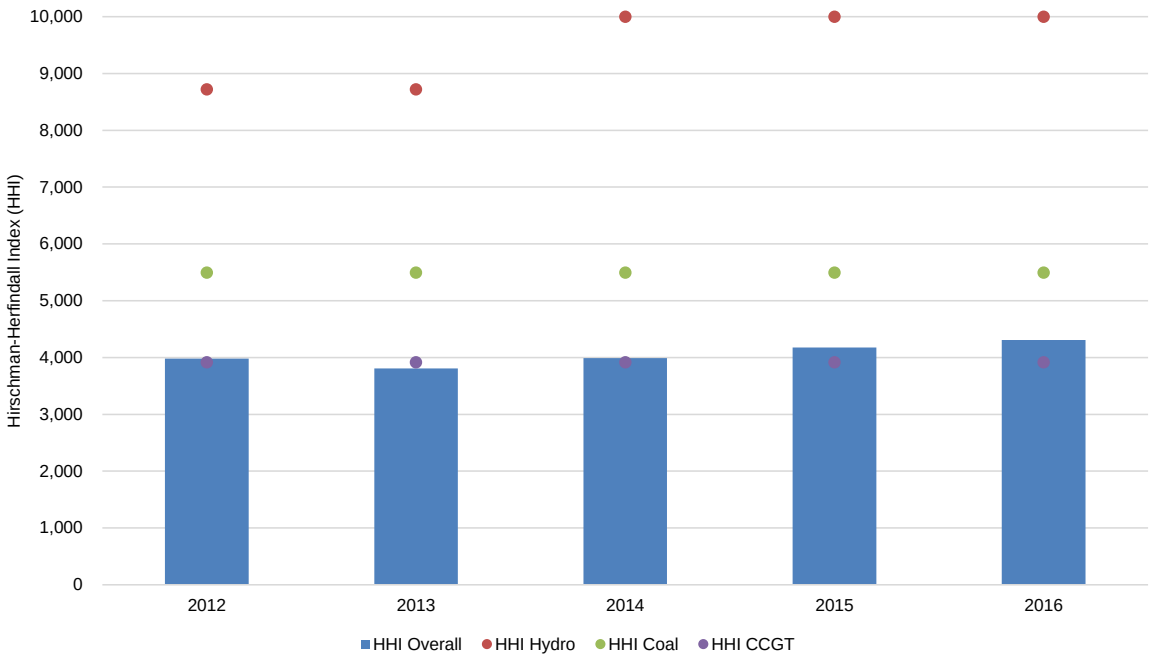
Figure 3-19 - Installed capacity shares by agents in the different technologies, 2012 to 2016



Source: REN data and EDP group

[35] 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 - Concentration in terms of installed capacity, 2012 to 2016



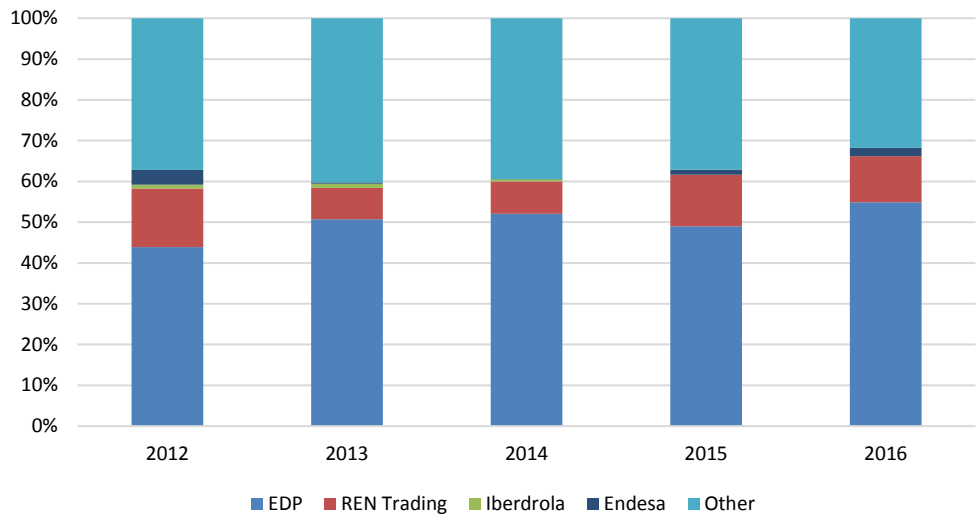
Source: REN data and EDP group

Until 2013, the HHI figures for installed capacity show a gradual reduction in the overall concentration of capacity supply in the Portuguese system, particularly via the aforementioned increase in SRG capacity. In the coal segment, no changes in the market concentration were recorded and, in the case of hydro, the entry into operation of the power boosting from the two plants held by EDP in 2012 led to an increase in corporate concentration in this technology. In 2014, the assignment, on 1 April 2014, of the operating rights over the hydroelectric plant of Aguieira/Raiva, which Iberdrola held by way of a tolling[36] contract with the EDP group, reinforced the full dominance of the incumbent in water technology. That dominance continued in 2015, due to the entry of new hydroelectric power plants owned by the same incumbent. In 2016, the integration of the Frades II hydroelectric power plant contributed to increase the concentration of capacity offer in the Portuguese system.

The evolution in quotas of electricity generation by agent is shown in Figure 3-21, while the same evolution in the different technologies and special regime with guaranteed remuneration are presented in Figure 3-22.

[36] 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.

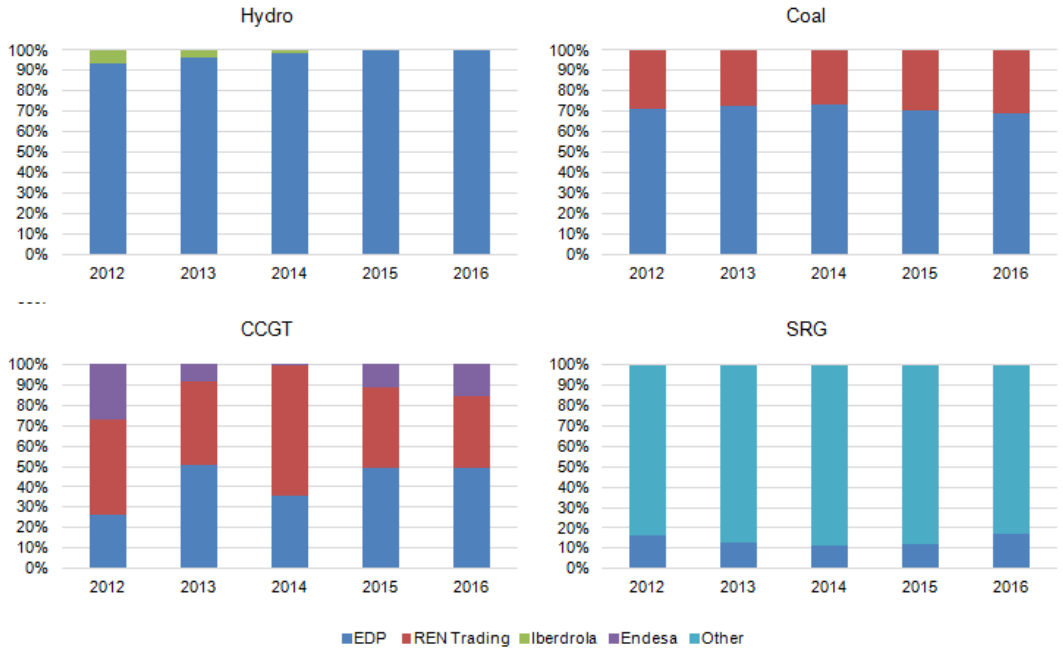
Figure 3-21 - Shares of energy generated by agent, 2012 to 2016



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

Overall, in 2016, an increase in the EDP group's participation in total generation in mainland Portugal must be highlighted, mainly due to an increase in hydropower generation due to a more favourable hydrological regime.

Figure 3-22 - Share of energy produced by agents in the different technologies, 2012 to 2016



Source: REN data and EDP group

In terms of electricity generated, the trend seen between 2012 and 2016 points towards a distinct evolution in the dominant operator EDP's generation quota in the main technologies. In SGR, the EDP group has

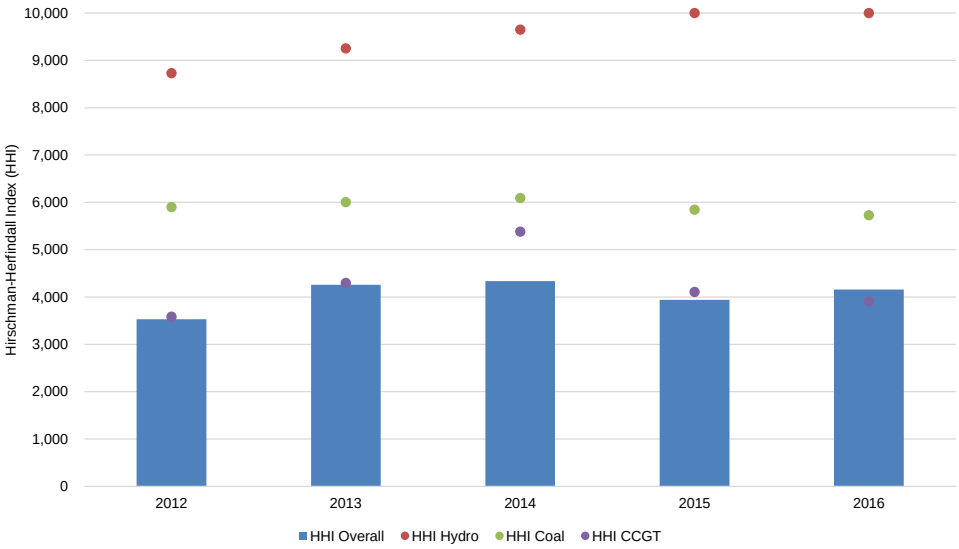
seen its quota reduced between 2011 and 2015, mainly due to the reduction in the generation from thermal sources with guaranteed revenue (biomass and cogeneration). In 2016 there was an increase in the annual share of the EDP group as a result of the consolidation of the ENEOP[37] wind assets, with an installed capacity of 613 MW, occurred at the end of the first quarter of 2015.

With regard to hydro production, 2016 was also market by the exclusive presence of the dominant operator EDP, as it owns all the major hydroelectric plants.

In the case of the natural gas combined cycle plants, there was a significant increase in generation in 2016, compared to 2015. This increase of approximately 1.1 TWh in absolute terms included the increased production of the generating assets held by the EDP Group, REN Trading (Turbogás plant) and Endesa (Pego plant). The increase in production witnessed across all the business groups led the EDP group to maintain its market share, when compared to 2015. REN Trading, with a lower absolute increase in relation to its competitors, witnessed a decrease in its market share. On the other hand, Endesa recorded an increase in market share as a result of a higher absolute variation in relation to its competitors.

The concentration indicators for the generation of electricity, presented in Figure 3-23 show that, in 2016, generation was less corporately concentrated than in 2015. This evolution is mainly supported by the increase in concentration in the EDP group's hydroelectric generation component.

Figure 3-23 - Concentration in terms of electricity generation, 2012 to 2016



Source: REN data and EDP group

[37] 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.

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 cannot be seen and, on the other, the figures for overall concentration will be equal to or greater that those that actually exist in the current market structure.

RESEARCH AND MEASURES TO PROMOTE EFFECTIVE COMPETITION

Within the framework of the role 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 binding under legal terms, 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 induce principles for the development of market competition. In terms of behavioural performance, ERSE, as the sector 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 2016, ERSE issued four opinions to the Competition Authority: an opinion on a controlling position in an electricity and natural gas supplier; an opinion on the acquisition of a company in the environmental area by a purchaser that was developing activities related to cogeneration production; an opinion on a controlling position of a company that owns electricity production assets, and an opinion on the decision to open an inquiry aimed at an electricity generating company:

1. ERSE Opinion on the acquisition of the joint control over Enforcesco, S.A. by Oxy capital, S.A. and by Enforce Capital, SGPS, S.A.;
2. ERSE Opinion on the acquisition and control of EGEO SGPG, S.A. by Finertec, Energia e Ambiente SGPS, S.A.;
3. ERSE Opinion on the acquisition of exclusive control over Generg Expansão, S.A. by Trustwind, B.V..
4. ERSE Opinion on the decision to open an inquiry aimed at EDP - Gestão de Produção de Energia, S.A., as a result of the findings of the external and independent audit carried out within the scope of

Order no. 4694/2014 of 1 April, of the Secretary of State for Energy, with the purpose of assessing and quantifying the risk of overcompensation under that State aid scheme (CMEC), within the framework of the functioning of the ancillary services market

3.2.2 RETAIL MARKET

Throughout 2016, 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 subject to an incentive to switch suppliers; the adoption of regulated risk coverage mechanisms by the suppliers; and enhanced 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 the other suppliers operating in the Portuguese market.

At the end of 2016, there were 24 suppliers operating on the market, 22 of which are present in the household consumers segment.

In 2016, supplier switching was marked by a significant penetration of suppliers on the liberalised market liberalised market in segments such as customers with the highest consumption, large customers and industrial consumers, but also in the household consumers segment; approximately 81% of household consumers were already in the liberalised market at the end of 2016 (6 percentage points (p.p.) more compared to the end of 2015).

The intensity of supplier switching is still high and, in 2016, switches occurred within the liberalised market represented, in number of customers, approximately half of the total supplier switches.

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

Suppliers send ERSE updated information on the reference prices[38] practised or expected to be practised in the scope of the sale of electricity for all Low Voltage (LV) electricity supply. 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 for minimum 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.

The information provided to ERSE by suppliers is included in simulation and decision-making support tools for consumers, made available by ERSE on its website[39], which are described in the following section.

Furthermore, all electricity suppliers inform ERSE on a quarterly basis on the average prices actually charged in the retail market. This information is used by ERSE to monitor and supervise the retail electricity market. It is also a tool used by official statistical data organisations (INE, the National Statistics Institute, at the national level, and Eurostat, at the European level, for example) to disclose the average market prices.

The analysis that was carried out allowed observing that, at the end of December 2016, there were 16 suppliers operating in the market, with a total of 75 mono (electricity only) offers, 35 dual (electricity and natural gas) offers and 41 offers with the sale of additional products, totalling 151 commercial offers for a consumer with an annual consumption of 5,000 kWh, 40% of which in off-peak period and a contracted power of 6.9 kVA[40], which is the most representative consumer, in units of energy, of the universe of household customers.

In this period, the mono commercial offer (electricity only) with the lowest annual electricity bill had a value of 848 €/year. The difference between this offer and the most expensive offer was 124 €/year (13%). The dual (electricity and natural gas) commercial offer with the lowest value amounted to 848 €/year, corresponding to a discount of approximately 13% compared to the most expensive offer.

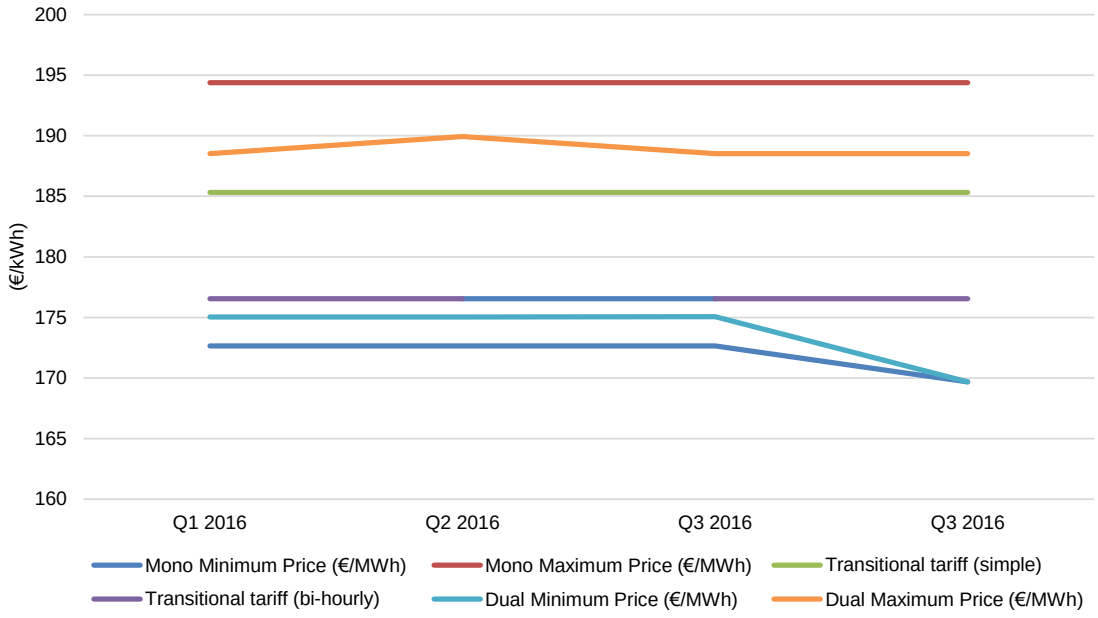
[38] Pursuant to Order no. 18637/2010 of 15 December, available at http://www.erse.pt/pt/legislacao/Legislacao/Attachments/1531/Despacho18637_%202010.pdf.

[39] At www.erse.pt.

[40] Consumer type 2.

Figure 3-24 shows the evolution of the prices of market offers (mono and dual), as well as the values of the transitional tariffs associated with the simple and bi-hourly options, in 2016. In this period, the prices of commercial offers remained stable, with a slight decrease of the minimum prices in the last quarter of 2016.

Figure 3-24 - Price of commercial offers of electricity (mono and dual) consumer type 2 in 2016



TRANSPARENCY

With the aim of continuing to provide information to electricity consumers on the reference prices charged in the market, as well as the computer tools to help customers choose a supplier, ERSE continues to update and offer simulators on its website that will give electricity consumers objective information to help them make an informed choice, namely regarding the selection of the best offer on the market, based on the following simulators:

- Market price comparison simulator for StLV supplies in mainland Portugal[41].
- Simulation of power to be contracted[42].
- Electricity Labelling Simulator[43].

[41] Available at http://www.erse.pt/pt/electricidade/simuladores/simuladoresdecomparacaodeprecosnomercado/Paginas/simuladorcomparacaodeprecos.aspx.

[42] Available at http://www.erse.pt/pt/electricidade/simuladores/simuladordepotenciaacontratar/Documents/ERSEkw.html.

[43] Available at http://simuladores.erse.pt/rotulagem.

ERSE has 3 other billing simulators, which are intended to simulate billings based on sale tariffs for end customers, published by ERSE and applicable in the Autonomous Regions of the Azores and Madeira, which, being outermost regions, are not subject to market liberalisation. Additionally, there is an electricity bill simulator for HV, MV and special low voltage (SpLV) customers from Mainland Portugal who are still being supplied by the last resort supplier[44], aimed at helping them to choose a supplier in the transition to the liberalised market.

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 accordance 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 webpage also provides all the information on reference prices and other contractual conditions that support the functioning of the simulator[45], in order to ensure that the information history covers all the commercial proposals available on the market.

Considering that the number of offers available to customers in StLV has been increasing, ERSE felt the need to create more effective conditions for consumer access to the necessary information, with the aim of enabling them to make properly informed choices. Therefore, ERSE has established[46] rules that determine the duty to disclose and harmonise the content of the conditions for the provision of pre-contractual and contractual information to electricity consumers in Mainland Portugal: the standardised contractual sheet. The use of the standardised contractual sheet is a measure considered by ERSE as efficient in the effective promotion of competition. This measure contributes to allow consumers to have a more effective access to information and compare the different offers with the aim of enabling them to make properly informed choices.

Suppliers with more than five thousand customers[47] are required to publicly disclose their commercial offers[48], 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 within 8 business days, for LV

[44] Available at http://simuladores.erse.pt/facturacao.

[45] Available at http://www.erse.pt/pt/Simuladores/Documents/PreçosRef_BTN.pdf.

[46] Diretiva no. 6/2015 of 27 April, available at http://www.erse.pt/pt/legislacao/Legislacao/Attachments/1877/Diretiva%206-2015.pdf.

[47] Under the terms of article 105 of the Commercial Relations Code, "when suppliers have 5,000 or more customers, it is assumed that their trading activities cover all types of electrical power supply."

[48] Through the media involved, as well as on the internet.

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 the customers, namely information regarding the network access tariff portion, the CIEG[49] portion and the labelling of electric power.[50].

Also with regard to electricity bills, ERSE approved, through Directive no. 14/2016 of 26 July, additional obligations applicable to electricity suppliers, making it mandatory for 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.

The rules for access to information regarding electric energy 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][51]. With regard to metering rules, EHV, HV, MV and SpLV facilities are equipped with remote metering systems (telemetering), four-hourly records for EHV, HV and MV and monthly remote metering for SpLV. In facilities connected in StLV, the reading is made locally. The distribution network operator is obliged to conduct a meter reading every 3 months[52], and should provide a toll-free telephone assistance service to all its customers so they can submit their own readings[53]. 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, particularly since 2012.

The evolution of the consumption and number of customers in the liberalised market in Portugal can be seen in Figure 3-25.

[49] Pursuant to articles 121 and 132 of the RRC, available at http://www.erse.pt/pt/electricidade/regulamentos/relacoescomerciais/Documents/SubRegulamentação/Diretiva%205-2016_DR.pdf.

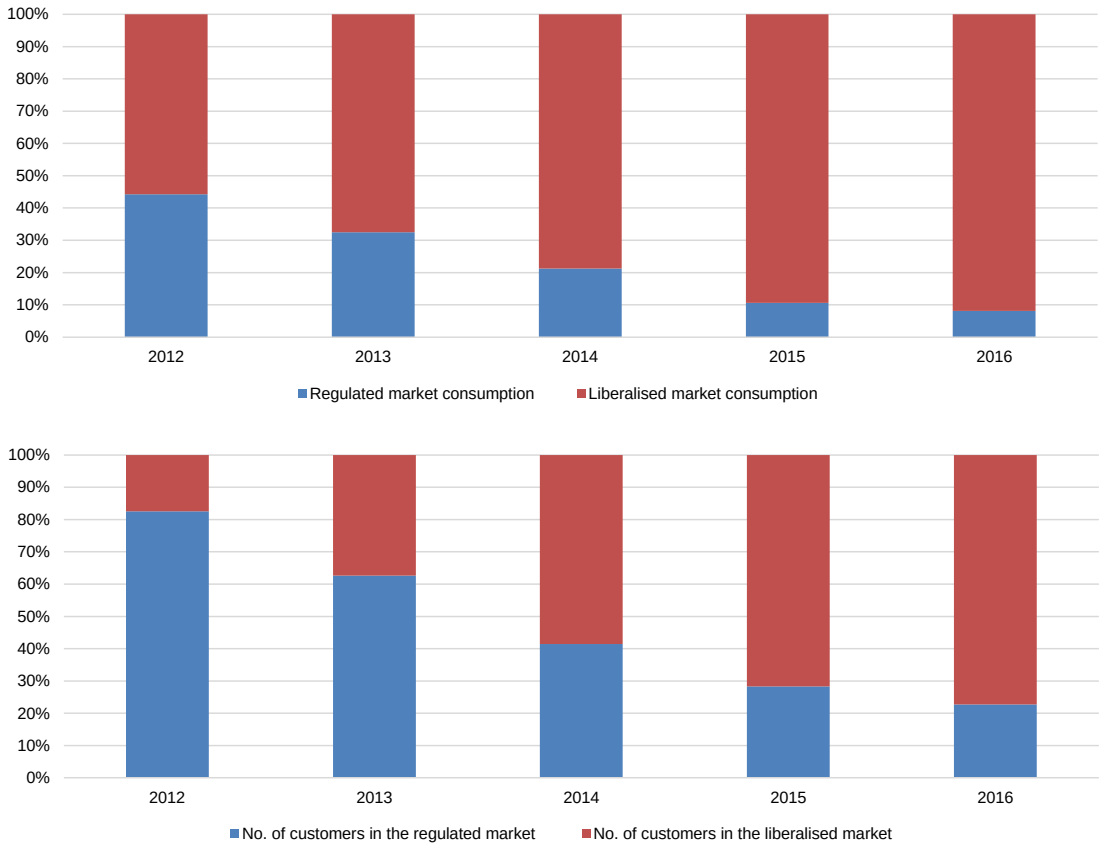
[50] Pursuant to articles 105 and 133 of the RRC, available at http://www.erse.pt/pt/electricidade/regulamentos/relacoescomerciais/Documents/SubRegulamentação/Diretiva%205-2016_DR.pdf.

[51] Available at http://www.erse.pt/pt/electricidade/regulamentos/relacoescomerciais/Documents/SubRegulamentação/Diretiva%205-2016_DR.pdf.

[52] Under the terms of article 268 of the Commercial Relations Code for the electricity sector, available at http://www.erse.pt/pt/electricidade/regulamentos/relacoescomerciais/Documents/RRC%20DR.pdf.

[53] Under the terms of article 35 of the Service Quality Code for the electricity sector, available at http://www.erse.pt/pt/electricidade/regulamentos/qualidadedeservico/Documents/DR_Regulamento%20455-2013-RQS.pdf.

Figure 3-25 - Breakdown of consumption and number of customers between the regulated and the liberalised market, 2012 to 2016



Source: REN and EDP Distribuição data

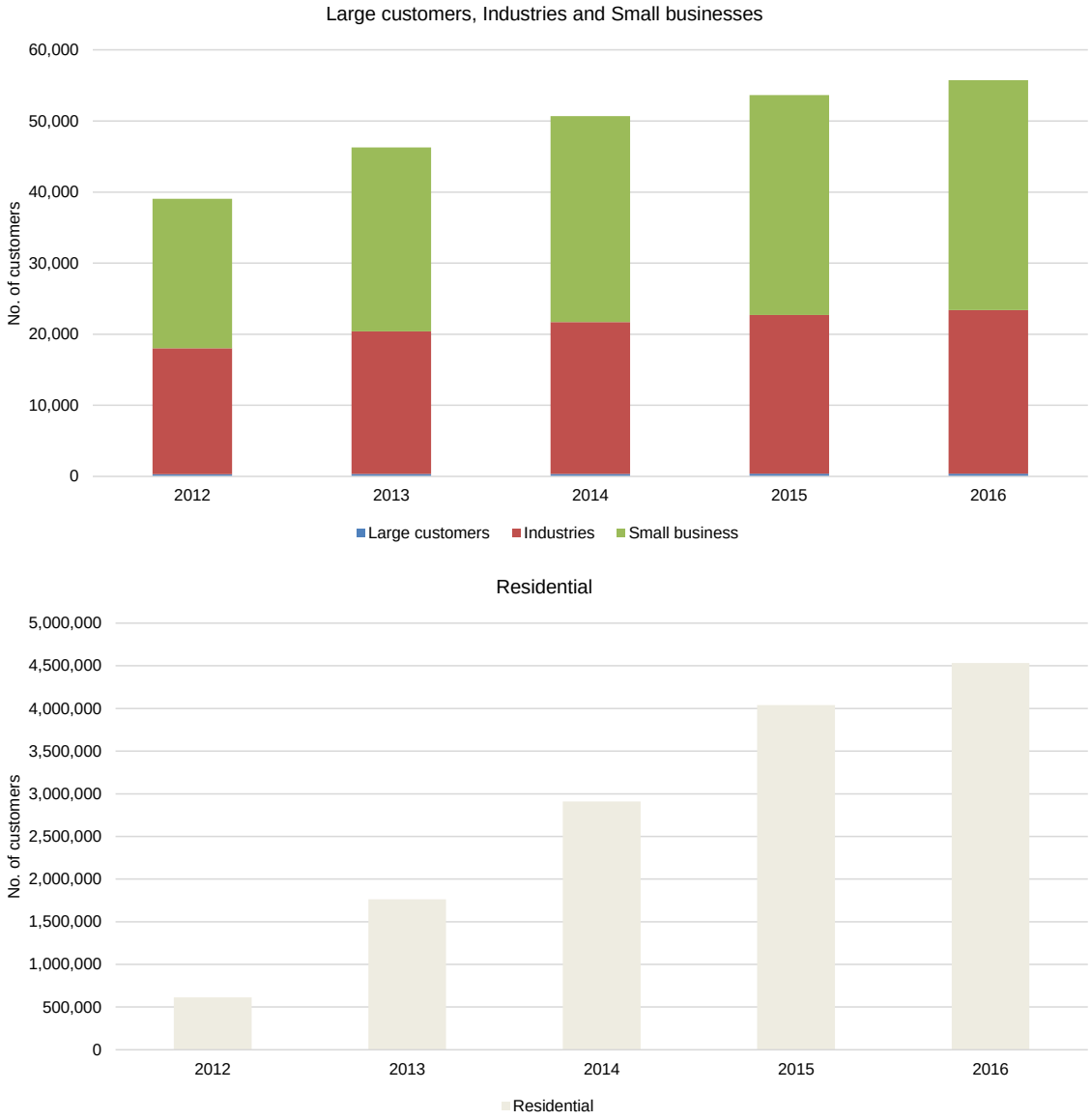
The increase in the size of the liberalised market, as demonstrated in the figure, was also due to the phase-out of the regulated tariffs thatphase-out of regulated tariffs, from January 2013, covered all customers, including residential ones. With this development, consumption in the liberalised market already represented approximately 92% of total consumption at the end of 2016.

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 residential customers, which in 2016 increased by nearly 12% in comparison to the previous year.

In what regards the number of residential customers, and despite the fact that this customer segment still has a low penetration in the liberalised market, approximately 77% of the customers in this segment have already made the transition to the liberalised market.

Erro! A origem da referência não foi encontrada., we can see that, in 2016, the segments with higher consumption – large customers (EHV[54] and HV), industrial customers (MV) and small businesses (SpLV) – continue to witness growth between 2% and 5% in the liberalised market.

Figure 3-26 - Evolution of the liberalised market in Mainland Portugal, 2011 to 2016



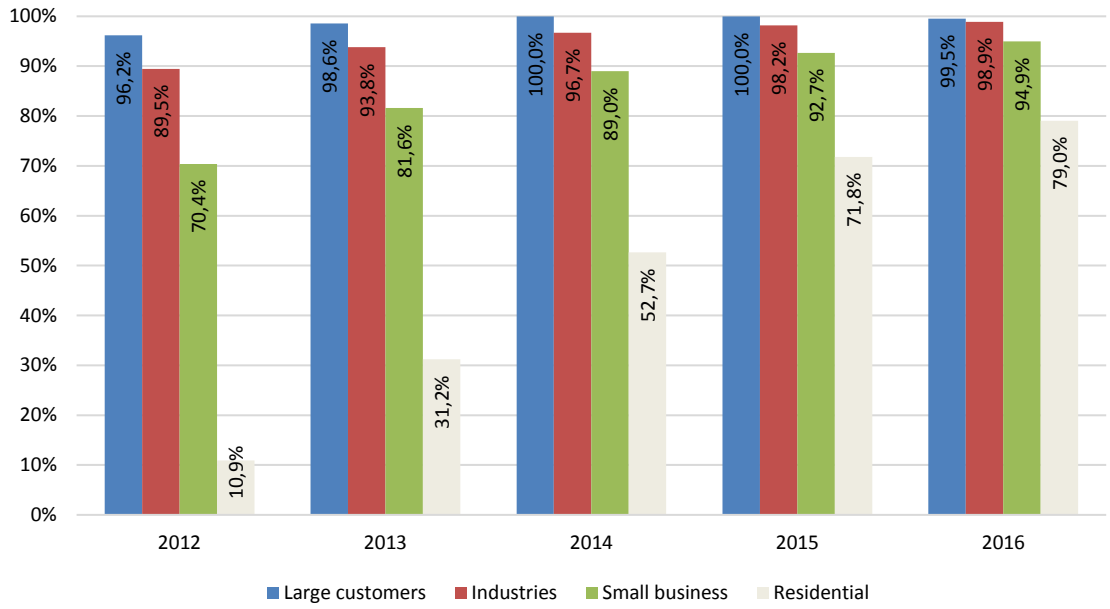
Source: EDP Distribuição data

The level of consumption associated with each customer segment of the liberalised market is shown in Figure 3-27, and it can be noted that, in 2016, all of the consumption by large customers was ensured by

[54] All VHV customers have been in the liberalised market since July 2013.

market suppliers, and the same happened with approximately 99% of the consumption by industrial customers.

Figure 3-27- Penetration of the liberalised market by customer segment, 2011 to 2016

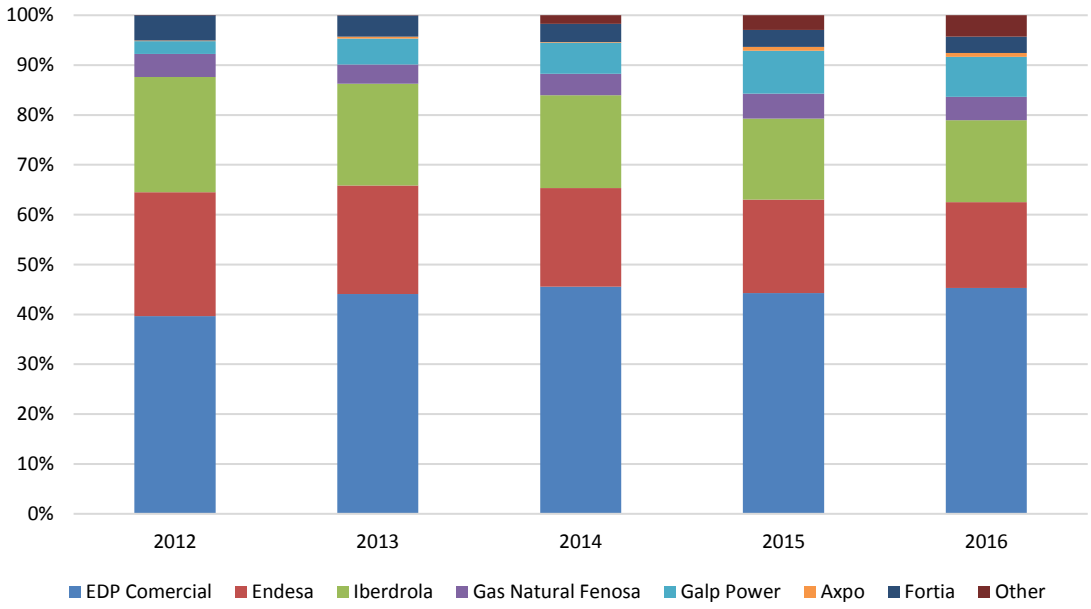


Source: EDP Distribuição data

In the liberalised market, an analysis by segment indicates that the industrial customer segment is the most competitive of all, while the residential customer segment had the most market concentration, with the number of suppliers in this segment continuing to increase in 2016.

Despite the growth of the liberalised market, which already involved 24 suppliers, and with the provision of more and better information to the consumers, the overall business concentration witnessed a slight increase in 2016. The growth of the EDP Group's 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 45% of supply in the past year, as we can see in Figure 3-28.

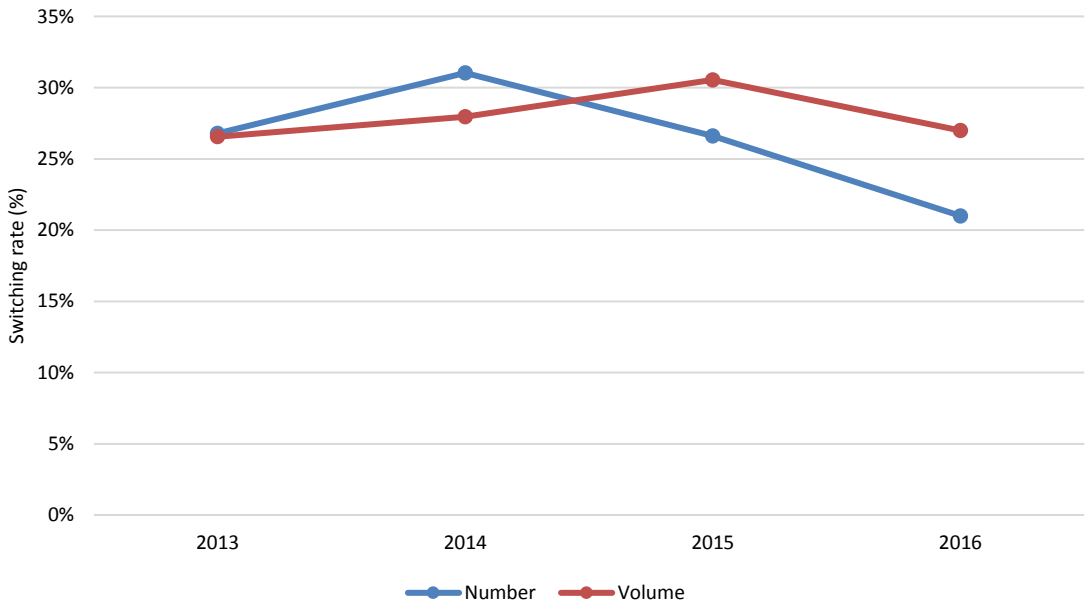
Figure 3-28 - Supply structure in the liberalised market by supplier, 2012 to 2016



Source: EDP Distribuição data

Supplier switching rates are still high and, in 2016, approximately 21% of the electricity consumers switched supplier. In December 2016, the switches within the liberalised market represented approximately 55% of the total number of supplier switches.

Figure 3-29 - Supplier switching, 2013 to 2016



Source: EDP Distribuição data

An analysis of the evolution of the retail market is available at the ERSE website in the form of a monthly report[55], which provides information regarding issues linked to competitive pressure on the market and on each of its segments.

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

RECOMMENDATIONS FOR SUPPLY PRICES

In 2016, ERSE does 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 of regulated electricity sale tariffs for end StLV, SpLV, MV and HV customers remains in force.

MEASURES TO PROMOTE EFFECTIVE COMPETITION

As mentioned above with regard to the wholesale market, ERSE has its own powers arising from the legal framework of the energy sector and competition.

In 2016, ERSE issued an opinion forwarded to the Competition Authority on the acquisition of the joint control over Enforcesco, S.A. by Oxy capital, S.A. and by Enforce Capital, SGPS, S.A..

In this case, ERSE expressed its non-opposition to the concentration operation, considering that the relative positioning of the activities developed by the Enforcesco company in the sale of electricity in Mainland Portugal as a small share in the electricity market (in number of customers and consumption), and Prio is currently operating in the electric mobility area. The companies involved in this operation did not integrate, directly or indirectly, any incumbent groups in the electricity sector and, therefore, they act as competition in activities related to electricity supply. Furthermore, ERSE considered the non-competition conditions included in the shareholders' agreement concluded between the parties, as well as the possible synergies that may arise from the complementarity between the activities developed by the companies.

55 http://www.erse.pt/pt/electricidade/liberalizacaodosector/informacaosobreomercadoliberalizado/2016/Paginas/2016.aspx

TRANSITIONAL REGIME FOR THE APPLICATION OF SALE TARIFFS FOR END CUSTOMERS OF THE LAST RESORT SUPPLIERS (SLR)

Since 1 January 2013, the sale tariffs for end customers published by ERSE for Mainland Portugal have a transitional nature. In 2016, these tariffs applied to HV, MV, SpLV and StLV supplies delivered by the last resort supplier; transitional EHV tariffs have been extinct, as the last resort supplier is no longer delivering supplies with this voltage level.[56].

The transitional sale tariffs for end customers in force from 1 January 2016 onward are determined by the sum of network access tariffs with the transitional energy tariff (which includes an aggravating factor) and the regulated[57] sale tariff, all approved by ERSE[58].

TARIFF DEFICIT

Sale tariffs for end customers were limited (i) in 2016, for LV, to ensure that their variation did not exceed the expected variation of the Implicit Price Index of Private Consumption and (ii) in 2017, in StLV, to ensure that their variation did not exceed 6%. These limitations created a tariff deficit for regulated companies. These deficits are recovered in continuing instalments through the GUoS (Global Use of the System) tariff over a period of 10 years, starting in 2008.

In the 2009 tariffs, 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 well as the extra cost of acquiring electricity from SRGs with guaranteed revenue pertaining to 2009.

From 2011 onward, there has been a new possibility for passing on 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 years.[59].

Decree-Law no. 178/2015 of 27 August, changed the inter-temporal transfer scheme in force, whose application has been extended until 8 December 2020 in accordance with article 73-A(8).

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[56] Decree-Law no. 15/2015 of 30 January, which amended Decree-Law no. 75/2012, reformulated the way the period is set for the application of the corresponding transitional tariffs for the supply of electricity to StLV end customers. Order no. 97/2015 of 30 March, established that the aforementioned period for the application of transitional tariffs ends on 31 December 2017. The period for the application of transitional tariffs to StLV customers was changed to 31 December 2020 by Law no. 42/2016 of 28 December.

[57] The transitional tariff scheme is determined through the joint application of Order no. 108-A/2015 of 14 April and Order no. 359/2015 of 14 October. Order no. 11566-A/2015 of 3 October, which determines the way the transitional tariff is updated is also applicable.

[58] Directive no. 16/2015 of 24 December, available at http://www.erse.pt/pt/electricidade/tarifaseprecos/tarifasreguladasdeanosanteriores/2016/Documents/Diretiva%2016_2015.pdf.

[59] Through the publication of Decree-Law no. 78/2011 of 20 June, specifically article 73-A.

The passing-on of costs differentials associated with the purchase of energy form the SRG has been applied annually, as we can see in the following table.

At the end of 2016, the amounts owed from are those shown in Table 3-5.

Table 3-5 - Tariff deficit, 2016

	Outstanding debt in 2016 (10^3 EUR)
Tariff deficit 2006/2007	38,483
Tariff deficit 2009	1,000,209
2013 SRG additional cost deferral	346,339
2014 SRG additional cost deferral	758,378
2015 SRG additional cost deferral	1,112,062
2016 SRG additional cost deferral	1,221,771
Other	240,869
Total	**4,718,110**

3.3 SECURITY OF SUPPLY

In the Portuguese legal framework, the competences concerning the security of supply in the electricity sector are the responsibility of the Government, which has delegated its monitoring to the DGEG[60]. However, ERSE monitors the evolution of the installed capacity and the evolution of demand, which is addressed in greater detail below.

We should note that, in 2016, and with a view to assessing the regime for the allocation of incentives to ensure security reserve provided by the electricity-generating plants to the National Electricity System (SEN), the Government asked ERSE to present a study on which that assessment could be based.

The technical assessment report prepared by ERSE was published[61] in June 2016 and established, as its main recommendation, the understanding that a possible review of the capacity payments mechanism 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 the regional level within the framework of the MIBEL. This

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

[61] http://www.erse.pt/pt/supervisaodemercados/mercadodeelectricidade/capacidade/Paginas/default.aspx

key recommendation was supported by the following criteria and reasoning: regional and European harmonisation, guidelines on State aid and compliance with market rules.

3.3.1 MONITORING THE BALANCE BETWEEN SUPPLY AND DEMAND

The capacity margin, defined as the difference between the installed capacity and the maximum load, in relation to the installed capacity, reached 58% in 2016, showing an increase of 4 p.p. compared to the value recorded in 2012. The installed capacity and peak evolution is shown in Table 3-6.

Table 3-6 - Capacity margin of the SEN, 2012 to 2016

	2016 (MW)	2015 (MW)	2014 (MW)	2013 (MW)	2012 (MW)	2016/2012 Change (%)
Total installed capacity	**19,518**	**18,533**	**17,833**	**17,790**	**18,546**	**5%**
Thermal	5,585	5,585	5,585	5,750	6,697	-17%
Hydro	6,522	5,724	5,269	5,239	5,239	24%
SRG	7,411	7,224	6,979	6,801	6,610	12%
Maximum load	**8,141**	**8,618**	**8,618**	**8,322**	**8,554**	**-5%**
Capacity margin	**11,377**	**9,915**	**9,215**	**9,468**	**9,992**	**14%**
	(58%)	(53%)	(53%)	(53%)	(54%)	

Source: REN data. In the table, the term "SRG" corresponds to SRG with guaranteed remuneration.

Furthermore, in 2016, the electricity consumption totalled 49.27 TWh, showing a slight increase of 0.6% compared to 2015.

Table 3-7 presents the total electricity consumption and its supply sources, in 2015 and 2016.

Table 3-7 - Consumption supply, 2016 and2015

	2016 (GWh)	2015 (GWh)	Change (%)
Hydro generation	15,298	8,797	73.9
Thermal generation	19,316	19,152	0.9
SRG	21,259	20,216	5.2
Import balance	-5,085	2,266	-324.4
Consumption of pumps	1,519	1,467	3.5
Total consumption	**49,269**	**48,964**	**0.6**

Source: REN data. In the table, the term "SRG" corresponds to SRG with guaranteed remuneration.

In 2016, there were exceptional hydrological conditions, with a hydrological index[62] of 1.33. Hydroelectric power plants on the liberalised market supplied 27% of electricity consumed, a figure much higher than the 18% recorded in the previous year. Thermal power plants on the liberalised market ensured a quota of 34%, with 21% of their generation coming from coal-fired plants and only 13% coming from natural gas power plants.

Deliveries to special-regime producers with guaranteed remuneration had a 38% consumption share, slightly below the 42% recorded in 2015.

In foreign trade, and for the first time since 1999, there was an export balance, equivalent to 9% of the production.

The percentage breakdown of electricity generation by power source in the last 5 years is presented in Table 3-8.

Table 3-8 - Breakdown of generation, 2012 to 2016

	2016	2015	2014	2013	2012
Coal	21%	28%	23%	23%	29%
Natural gas	13%	11%	3%	3%	13%
Hydro	27%	18%	30%	28%	14%
SRG	38%	42%	45%	46%	44%

Source: REN data. In the table, the term "SRG" corresponds to SRG with guaranteed remuneration.

The power required from the public network reached its maximum on 17 February 2016, reaching a figure of 8,141 MW which, compared to the peak reached in 2015, showed a reduction of 477 MW, a circumstance that contradicts the increase recorded in the previous year, returning to the successive reduction in maximum load occurred in previous years.

Table 3-9 shows the day of annual peak demand from 2012 to 2016.

[62] Indicator quantifying the imbalance of the total value of hydroelectric power produced during a given period, in comparison with what would be produced under average hydrological conditions.

Table 3-9 - Day of annual peak demand, 2012 to 2016

Year	Day	Peak (MW)	Variation (%)
2016	17-fev	8,141	-5.53
2015	07-jan	8,618	3.67
2014	04-fev	8,313	-0.11
2013	09-dez	8,322	-2.71
2012	13-fev	8,554	-6.94

Source: REN data

In 2016, with regard to the installed capacity at plants on the liberalised market, we highlight the entry into operation of the Frades II plant, with 780 MW (reversible), integrated into the Venda Nova/Frades plant.

In terms of subsidised generation with guaranteed remuneration, we highlight the 200 MW -increase in the energy produced by wind generators, particularly the Douro Sul wind farm, with 149 MW.

The installed capacity evolution at the end of each year is shown in Table 3-10.

Table 3-10 - Power generation capacity, 2016 and 2015

	2016 (MW)	2015 (MW)	Change (MW)
HYDROELECTRIC POWER PLANTS (market-based)	**6,522**	**5,724**	**798**
THERMAL POWER PLANTS (market based)	**5,585**	**5,585**	**0**
Coal	1,756	1,756	0
Natural gas	3,829	3,829	0
SRG INSTALLED CAPACITY	**7,411**	**7,224**	**187**
Thermal Generators	1,503	1,547	-44
Hydro Generators	423	422	1
Wind generators	5,046	4,826	220
Photovoltaic Generators	439	429	10
TOTAL	**19,518**	**18,533**	**985**

Source: REN data. In the table, the term "SRG" corresponds to SRG with guaranteed remuneration.

In 2016, the main developments aimed at ensuring the security of supply in the RNT were the following:

- Construction of a 400 kV line between the Pedralva substation and the Ponte de Lima area, in the Minho region.

- Opening of the Terras Altas de Fafe-Riba d'Ave 150 kV line for the Fafe substation, covering the Fafe, Guimarães, Vizela and Felgueiras municipalities.
- Completion of the renovation of the protection, automation and control systems of the Torrão, Évora, Rio Maior, Chafariz and Vila Fria substations.

In terms of quality of supply, the transmission network recorded an Equivalent Interruption Time of 0.34 minutes.

3.3.2 MONITORING INVESTMENTS IN GENERATION CAPACITY

In 2016, there were no developments concerning new investments in thermal generation capacity. In addition, not further developments are expected as the producers announced their intention to drop out of the new undertakings licensed by the DGEG[63] (i.e. 4 new CCGT 400 MW groups).

In terms of hydroelectric generation capacity, we should highlight the entry into operation of the Frades II plant with 780 MW (reversible). Within the scope of the implementation of the National Programme of Dams with Significant Hydroelectric Potential (PNBEPH) until 2030 and of its (ongoing) review, which covers a series of new plants, some of which have been completed, the Report on the Monitoring of Supply Security in the National Electricity System for the 2017-2030 period (RMSA-E 2016), approved by the Government, confirms the decisions of the PNBEPH to postpone the Fridão hydroelectric plant (238 MW) to 2026 and to exclude the Girabolhos (364 MW) and Alvito (225 MW) plants.

In terms of wind generators, we highlight the 200 MW increase, and particularly the Douro Sul wind farm, with 149 MW.

With regard to forecasts for installed capacity in renewable energy sources, the ones included in the National Action Plan for Renewable Energies (PNAER 2020) continue to be adopted[64], as shown in Table 3-11. We should highlight that, in addition to Mainland Portugal, the PNAER includes the geothermal energy from the Autonomous Region of the Azores (RAA).

[63] Report on Monitoring Security of Supply in the National Electricity System for the period from 2015 to 2030.

[64] PNAER 2020: Part II of the Resolution of the Council of Ministers no. 20/2013, published in the official Portuguese Gazette, Series I of 10 April.

Table 3-11 – Evolution forecast for renewable energies 2018 and 2020

	2018 (MW)	2020 (MW)
Wind	5,142	5,300
Hydro (< 10 MW)	379	400
Hydro (> 10 MW)	8,540	8,540
Biomass	814	828
Solar	589	1816 (1)
Waves	6	6
Geothermal	29	29

Source: PNAER 2020 and (1) RMSA-E 2016 data

3.3.3 MEASURES TO MITIGATE PEAKS IN DEMAND OR DISRUPTIONS IN SUPPLY

With regard to the security of supply in the electricity sector, during 2016, 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 infrastructures of the National Natural Gas System (SNGN), including the transmission network, include the Infrastructure Operation Code (ROI), while the rules and detailed procedures are integrated into the Procedure Manual for the Overall Technical Management of the SNGN (MPGTG), approved by ERSE.

In 2016, the aforementioned regulations and manual were subject to reviews, to a large extent induced by the publication of the Network Code on Gas Balancing of Transmission Networks, substantiated by Regulation (UE) no. 312/2014 of 26 March, and of the network code on interoperability and data exchange rules, through Regulation (EU) no. 2015/703 of 30 April.

The transmission network balancing model, established in the aforementioned Community Regulation, is substantially different from the one that was previously in force in the SNGN. In fact, the old model considered the market agents to be accountable for ensuring the balance between their RNTGN supply and consumption, via the allocation of tolerances and a subsequent offset in kind. The balancing model applicable from 1 October 2016 onward strengthens the individual accountability of the market agents via a physical and financial reconciliation at the end of each gas day[65]. On the other hand, and to allow the market agents to balance their RNTGN supply and consumption, there are minimum requirements concerning the provision of information to the market agents by the SNGN's Global Technical Manager (GTG) and the SNGN's infrastructure operators, which allow implementing a balancing scheme based on the functioning of the market.

The GTG is responsible for the residual balance, achieved through the implementation of balancing actions, namely to the use of short-term organised markets and balancing services. When the new balancing system was launched, on 1 October 2016, the GTG was only able to rely on balancing services to carry out balancing actions.

[65] Period between 5:00 a.m. and 5:00 a.m. (UTC) of the following day, in the winter time, and between 4:00 a.m. and 4:00 a.m. (UTC) of the following day, in the summer time.

Balancing services are market mechanisms (auctions) which take place in a discrete way, being triggered by the GTG as established in the MPGTG. The purpose of those auctions is to purchase or sell natural gas in order to replace operation gas (linepack) in accordance with appropriate parameters for the management of the transmission network. These auctions are open to all the market agents operating in the SNGN and supervised by ERSE.

The ROI and MPGTG proposals were submitted for public consultation between 18 December 2015 and 3 February 2016 and between 22 July 2016 and 7 September 2016, respectively. The ROI was published on 14 April 2016 and the MPGTG was published on 27 October 2016.

4.1.1.2 ACCESS TO STORAGE INFRASTRUCTURES, LINEPACK AND ANCILLARY SERVICES

As mentioned above, from 1 October 2016 onward the management of the market agents' balancing portfolios ceased to benefit from individual tolerances for the balance between the supply and the demand of natural gas in the transmission network. However, the access to linepack (storage in the RNTGN) remains explicitly as a service provided by the GTG based on the awarding of contracts. During the launch of the new balancing model, the allocation method of linepack to the market agents that subscribed to the service remained unchanged, without additional costs, until the return of the gas quantities allocated to the operational reserve and the acquisition of filling gas and operation gas by the transmission network operator.

In addition to the transmission network linepack access, there is a regulated third-party access regime concerning the storage of natural gas at the Carriço underground storage infrastructure and at the Sines Liquefied Natural Gas (LNG) terminal. ERSE approves the capacity allocation mechanisms detailed in the Procedures Manual for Access to the SNGN Infrastructures (MPAI) and the tariffs for the use of said infrastructures, ensuring that there will be sufficient capacity to meet the commercial needs of the market agents.

We should note that the allocation of capacity in the LNG terminal and in the Carriço underground storage infrastructure, follows a methodology similar to the one used for standard capacity products established in the NC CAM, with the necessary amendments.

ERSE monitored the conditions for access to the storage infrastructures and we should highlight that there have been no situations of denial of access to those infrastructures to date.

4.1.1.3 THIRD-PARTY ACCESS TO STORAGE

The general principles applicable to the access to SNGN networks and infrastructures, including the Carriço underground natural gas storage infrastructure and the Sines LNG terminal integrate the Access to

Networks, Infrastructures and Interconnections Code (RARII), while the corresponding detailed rules and procedures are established in the MPAI, approved by ERSE.

The RARII was reviewed in 2016 to include the implementation of capacity products with shorter maturities in the Carriço underground natural gas storage infrastructure, namely daily storage capacity products.

The RARII proposal was submitted for public consultation between 18 December 2015 and 3 February 2016, and published on 14 April 2016.

4.1.1.4 CONNECTIONS TO NETWORKS

The regulatory framework for the commercial conditions governing connections to the network includes, among others, the following aspects:

- Mandatory connection to the network;
- Type of charges that can be levied;
- Rules for calculating network connection charges;
- Budget content and submission deadlines;
- Terms for connection charge payment;
- Construction of the network connection elements; and
- Provision of information.

The network operator is required to provide network connection to customers who request it in accordance with the commercial conditions approved by ERSE. Distribution network operators are subject to a requirement of connection only for customer installations with an annual consumption of 10,000 m^3 (n), as well as for installations located within the area of influence of the respective network, defined as the geographic area in the proximity of the existing network, whose boundary is defined by ERSE (currently 100 m).

Natural gas installations cannot be connected to networks without the prior issuance of a licence or authorisation by the relevant administrative bodies.

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.

Regulation codes require that network operators send information to ERSE, on a half-yearly basis, on the number of connections established, co-funding granted to requesters, broken down by type of connections elements, total length of elements built, average budgeting deadlines and average execution times, as well as the number of changes made to existing connections.

ERSE's responsibility code does not define maximum execution deadlines for the connection to natural gas networks. However, for monitoring purposes, the distribution and transmission network operators are required to provide ERSE with half-yearly information regarding connections to natural gas networks, which includes, among other aspects, the average execution time of connections made by the network operators. In 2016, the average time required for the execution of works to connect facilities with an annual consumption of up to 10,000 m^3 (n) to the distribution networks was approximately 39 days, for a total of 12,262 connections.

4.1.1.5 TECHNICAL QUALITY OF SUPPLY

The Quality of Supply Code (RQS) for the natural gas sector sets out, in Chapter II, 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 infrastructures (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 2016, the most significant aspects in terms of the performance of the LNG terminal were the following:

- The terminal supplied 4629 LNG tanker trucks (a slight reduction compared to the value recorded in 2015, which totalled 4675 tanker trucks);
- The number of tanker trucks experiencing a delay in loading corresponded to 6% of the total (1 p.p. above the figure recorded in the previous year). The main causes of delay were the unavailability of the fuelling stations, the cooling of tanks, operational unavailability at the LNG terminal and technical problems;
- There was a total of 22 unloading operations involving carriers (against 25 carried out in 2015);
- No delays were recorded in the unloading of carriers (as in 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 storage (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 2016, the compliance of the injection and extraction assignments and energy storage compliance was 100%.

The continuity of the transmission network supply 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 2016 there were no interruptions of supply in any transmission network exit point.

In the distribution networks, as with the transmission network, performance is evaluated through indicators that consider the number and duration of interruptions. In 2016, there were no interruptions in 4 out of the 11 existing distribution networks (Beiragás, Duriensegás, Dianagás, Sonorgás and Paxgás) and only 0.44% out of approximately 1.42 million customer installations suffered interruptions. No customer was affected by more than one interruption. Nearly 48% of the interruptions 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 1.5 minutes in all the distribution networks.[66].

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 2016, 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 2016, the pressure supplied was monitored at 317 points in the distribution networks. There were one-off incidents of non-compliance with 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 for the natural gas sector, ERSE publishes a service quality of service report on a yearly basis[67], to characterise and assess the quality of service for the activities covered by the natural gas sector.

[66] 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/

[67] Available at http://www.erse.pt/pt/gasnatural/qualidadedeservico/relatoriosdequalidadedeservico/

4.1.2 TARIFFS FOR CONNECTION AND ACCESS TO INFRASTRUCTURES

REGULATORY REVIEW

On December 18th, 2015, ERSE submitted for public discussion a regulatory review proposal that covered the Commercial Relations Code (RRC), the Tariff Code (RT), the Access to Networks, Infrastructures and Interconnections Code (RARII) and the Infrastructure Operation Code (ROI) of the natural gas sector, which coincided with the beginning of the new 3-year regulatory period. The review of the RT was published in 2016, through Regulation no. 415/2016 of 29 April, and addressed several matters, from which we highlight the following:

- Introduction of a greater flexibility in the network access tariff structure, contributing to an increased use of the natural gas system by consumers whose consumption is concentrated in time;
- Provisions for new capacity products and respective tariffs in High-Pressure infrastructures;
- Introduction of new consumption bands, in the various pressure levels, considering the suggestions given in the public consultation which allowed tackling difficulties related to the application of High-Pressure network access tariffs to Medium-Pressure customers.
- Discussion of the neutrality charge models aimed at the application, from October 2016 onward, of European Regulation no 312/2014, establishing a Network Code on Gas Balancing of Transmission Networks.

PROCEDURES AND METHODOLOGY FOR CALCULATING NATURAL GAS INFRASTRUCTURE ACCESS TARIFFS

Considering the beginning of a new regulatory period, in July 2016, there were several studies aimed at analysing the adequacy of the tariff structure per regulated activity. These studies led to changes in the structure of the tariff for the Use of the LNG Reception, Storage and Regasification Terminal, the tariff for the Use of Underground Storage and the tariff for the Use of Distribution Networks.

The following brief explanation of the new Portuguese tariff system serves to contextualise the tariff calculation methodology.

Infrastructure access tariffs are owed for access to the infrastructures in question, particularly, the tariffs for the Use of the Transmission Network, for the Use of the Distribution Network, for the Use of the LNG Reception, Storage and Regasification Terminal and for the Use of Underground Storage. Both the natural gas market prices, and the prices of the transitional tariffs of Sale to End Customers include network access tariffs.

Generally speaking, these infrastructure access tariffs are paid by suppliers on behalf of their customers. However, they may be paid directly by customers benefiting from the status of Market Agent, i.e. customers buying energy 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.

With regard to the relationship between tariffs and costs, the principle is to identify the services associated with each regulated activity. Each of these services requires the definition of the most appropriate physical variables to ascertain the costs that are effectively associated with the service provided to each customer. This set of physical variables and the corresponding measuring rules are the items to be considered in each of the tariffs.

NETWORK ACCESS TARIFF PRICES IN 2016

In the natural gas sector, there are some regulated activities whose allowed revenues are established by ERSE and are recovered by the following tariffs: Global Use of System, Use of Transmission Network, Use of the LNG Reception, Storage and Regasification Terminal, Use of Underground Storage, Use of MP Distribution Network, Use of LP Distribution Network, Energy and Supply.

The aim is to ensure that the billing variables of each tariff per activity translate the costs that are actually incurred. The prices of these billing variables are determined so as to present a structure aligned with the marginal or incremental costs structure, establishing bands that allow ensuring the revenue authorised for each regulated activity and the economic and financial balance of the companies.

The average price of Infrastructure Access Tariffs for the 2016-2017 gas year and its variation relative to the previous gas year (2015-2016), is shown in the following tables.

Table 4-1 - Evolution of infrastructure access tariffs for the 2016-2017 gas year

Access tariffs per pressure level	Average price 2015-2016 (EUR/MWh)*	Average price 2016-2017 (EUR/MWh)	Change
Power Plant Access	3.82	3.31	-13.5%
HP Customer Access	2.60	2.33	-10.6%
MP Access (>= 1,000,000 m3)	6.50	4.28	-34.2%
LP Access> (> 10,000 m3 | < 1,000,000 m3)	20.41	15.87	-22.2%
LP Access< (<= 10,000 m3)	40.40	32.68	-19.1%

***** Application of 2015-2016 tariffs to the demand forecast for 2016-2017.

Source: ERSE data

Table 4-2 - Tariff evolution per activity 2017-2016/2016-2015

Tariffs per activity	2015-2016 tariffs (average prices), 2016-2017 consumptions* (EUR/MWh)	2016-2017 tariffs (average prices), 2016-2017 consumptions (EUR/MWh)	Change
Sines Terminal	2.20	2.29	4%
Underground Storage	12.17	12.17	0%
Use of Transmission Network	2.41	1.90	-21%
Use of Distribution Network	11.95	9.16	-23.4%
Global Use of the System	1.12	1.16	3%

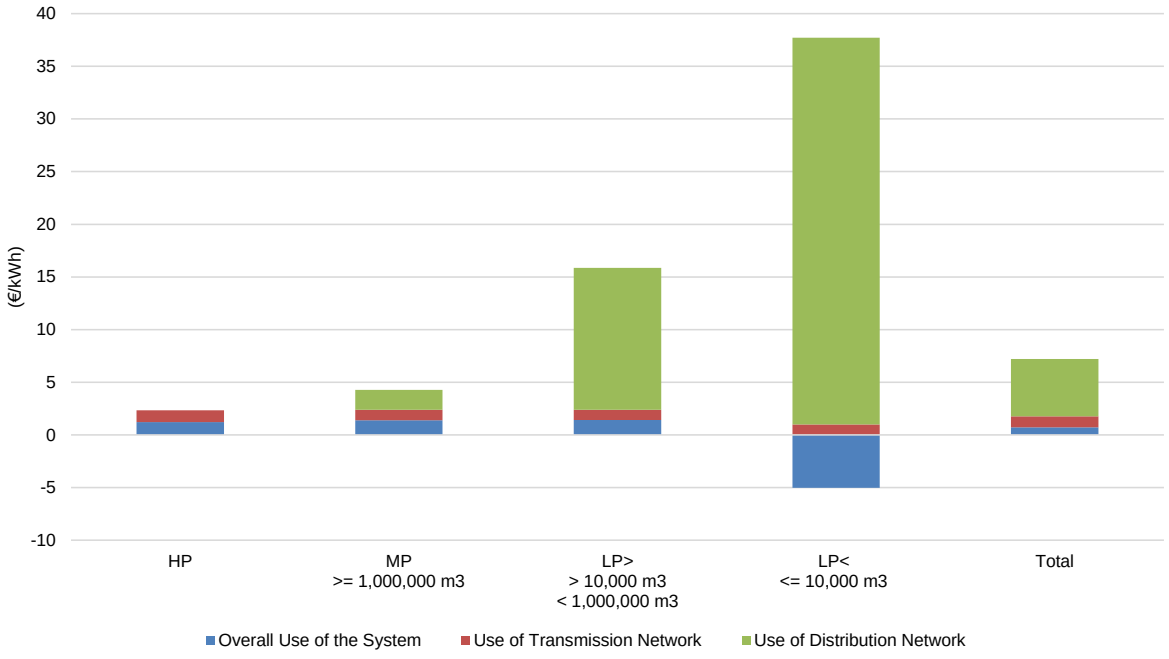
***** Application of 2015-2016 tariffs to the demand forecast for 2016-2017.

Source: ERSE data

The figures below present the breakdown and structure of the average price of the Network Access tariffs, by the various tariffs of which they are composed, for each pressure level. High-pressure access does not include electricity generation centres.

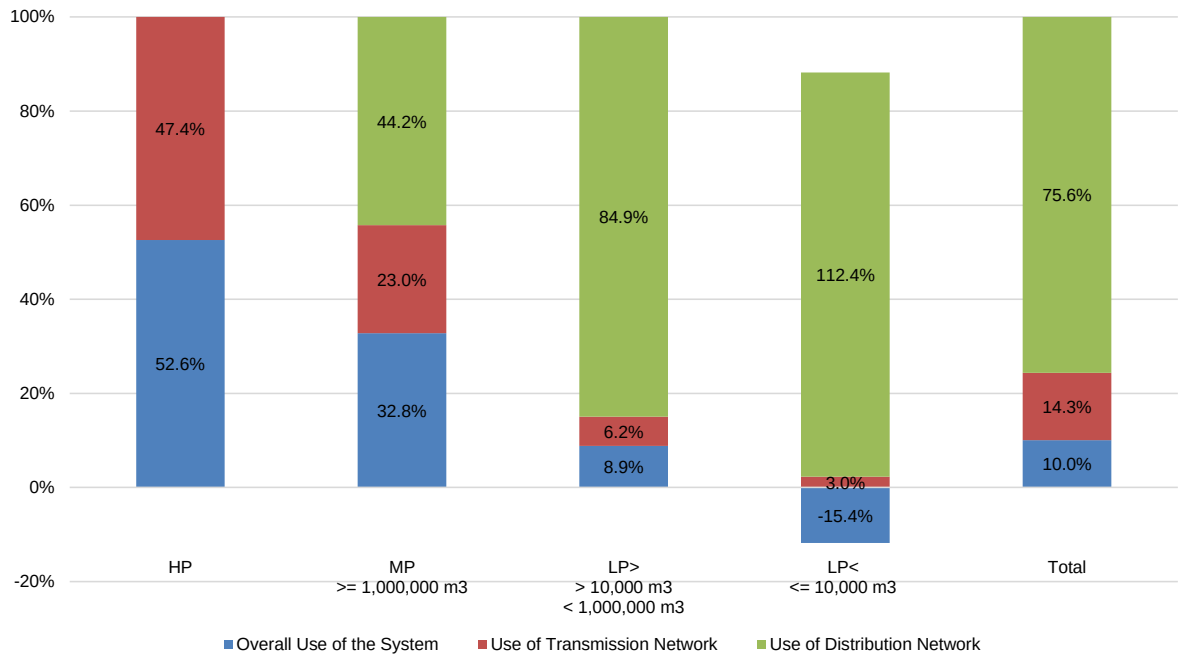
The price of the global use of the system tariff was negative considering adjustments of energy imbalances from previous negative years, i.e., values that are returned to the consumers.

Figure 4-1- Breakdown of the average price of Network Access Tariffs



Source: ERSE data

Figure 4-2 - Structure of the average price of Network Access Tariffs



Source: ERSE data

TARIFF ADDITIVITY APPLIED TO THE NATURAL GAS INFRASTRUCTURE ACCESS TARIFFS

Customers who intend to use natural gas infrastructures, namely the networks, the LNG terminal and underground storage, must pay the respective access tariffs.

Network access is paid by all consumers of natural gas. Access tariff prices for each billing variable are determined by adding up the corresponding tariff prices per activity. Insofar as the tariffs making up this sum are based on marginal costs, cross-subsidisation between consumers is avoided and an efficient use of resources is promoted.

Tariffs for the Use of the LNG Reception, Storage and Regasification Terminal and the Use of Underground Storage are paid only by users of these infrastructures.

This tariff calculation methodology allows for detailed knowledge of the various tariff components by activity or service. Therefore, each customer can know exactly how much they pay, for example, for the use of the MP distribution network, and how that value is considered in terms of billing. transparency in the formulation of the tariffs, which is a consequence of implementing this type of system, gains special importance for customers who have no experience in selecting a supplier and, in particular, for customers who are less informed.

REGULATION METHODOLOGIES FOR DETERMINING ALLOWED REVENUE

2016 was the first year of the 2016-2017 to 2018-2019 regulatory period. The beginning of a new regulatory period coincides with the assessment of the existing regulation methodologies and with the definition of new regulation parameters. The regulatory models for the regulatory period in force, for each regulated activity, are set out below:

- Reception, Storage and Regasification of LNG - application of a price cap[68] methodology for operational costs (OPEX[69]) and of a rate of return methodology with a 10-year capital cost-flattening mechanism (ending in the 2016-2017 gas year) for CAPEX[70]; application of a mechanism for the attenuation of tariff adjustments that recognises positive externalities for the entire national natural gas system (SNGN) associated with this activity.
- Subterranean Storage - price cap[71] methodology for OPEX regulation and rate of return methodology for CAPEX; application of a mechanism for the attenuation of 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 a price cap methodology with one portion that is not indexed to the evolution of physical variables and three portions 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. So, this activity follows a rate of return methodology for CAPEX, and a revenue cap methodology for the OPEX portion composed of intragroup costs.
- Natural Gas Distribution - price cap[72] 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; and

[68] The cost driver that determines the evolution of revenue recoverable by application of the respective tariff is regasified energy.

[69] *Operational expenditure*.

[70] *Capital expenditure*.

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

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

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 and (v) 2% and 7%, per company, in distribution.

Highlight also goes to the methodology that is being used for indexing the cost of capital, introduced in the 2013-2014 to 2015-2016 regulatory period. This will enable the evolution of the economic and financial context to be reflected, thereby compensating equity and other risks[73]. 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 RULING

In terms of appealing against a ruling or methodology used by the regulating entity, under the terms provided for in Article 41(1) of Directive 2009/73/EC, it should be noted that the natural gas distribution network concessionaires 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 2016.

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.

NETWORK CONNECTION COSTS

In the regulatory review of the natural gas sector occurred in 2016, ERSE established the need to review the sub-regulations that define the conditions for sharing costs between the requesters of new connections and the natural gas system, which should be aimed at increasing economic efficiency as part of the distribution of natural gas. The guiding principle of that review is to ensure that, in the specific case of the integration of existing consumption hubs, there is the possibility of separating the investments made on the extension of the network that increase the densification of costs (and, consequently, reduces the unit costs of natural gas distribution) from those that brings negative contributions into the systems through an increase of the unit costs of natural gas distribution.

4.1.3 CROSS-BORDER ISSUES

The capacity allocation and congestion resolution mechanisms applied to SNGN infrastructures are established in accordance with the principles laid down in the RARII, which is approved by ERSE.

[73] For gas year 2016-2017, the asset remuneration rates were the following: high-pressure activities - 5.90%; distribution activities – 6.20%. Since the gas year runs from June of one year to June of the following year, the final rate for the 2016 calendar year includes different methodologies for the 1st semester (AP: 7.49%; MP/BP : 7.99%) and for the second semester of that year (AP: 6.05%; MP/BP : 6.35%).

The RARII integrates the principles laid down in Commission Regulation (EU) no. 984/14 of 14 October 2013, establishing a Network Code on Capacity Allocation Mechanisms in Gas Transmission Systems and supplementing Regulation (EC) no. 715/2009 of the European Parliament and of the Council of 13 July, on conditions for access to the natural gas transmission networks.

The review of the RARII opened 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 allocation of long-term capacity can occur via the "stacking" of yearly capacity products; however, in 2016, the offer and allocation was limited to products whose duration does not exceed the 2016-2017 capacity allocation year.

The detailed rules and procedures concerning capacity allocation mechanisms, congestion resolution and management mechanisms and methodologies for determining capacity in SNGN infrastructures are established in the Procedures Manual for Access to the SNGN Infrastructures (MPAI). This manual underwent a thorough review in 2015 and is due to be reviewed in 2017 to allow implementing rules and procedures for the allocation of implicit capacity to the VIP (Virtual Interconnection Point), among other less significant changes. We should also note that the offer of implicit capacity in the VIP was established in the regulatory review of the RARII, having earned a widespread support among the stakeholders during the respective public consultation.

The rules for the harmonised allocation of capacity in the natural gas interconnections between Portugal and Spain, in 2016, were exclusively based on European network code on capacity allocation mechanisms in gas transmission systems, whose application became compulsory in all Member States on 1 November 2015. PRISMA was the platform adopted for that purpose, as in most of the natural gas interconnections throughout the Community.

In 2016 there was no congestion in SNGN infrastructures, i.e. there were no situations of denial of access to those infrastructures. However, the review of the RARII integrated a series of provisions laid down in Regulation (EC) no. 715/2009 of the European Parliament and of the Council of 13 June, particularly the ones concerning congestion management mechanisms[74]. Therefore, the application by market agents of the voluntary capacity surrender mechanism to monthly capacity products is due to be extended.

ACCESS TO INTERCONNECTIONS

Access to interconnections occurred via annual, quarterly, monthly, daily and intraday auctions carried out in the PRISMA platform.

[74] Commission Decision of 24 August 2012 on amending Annex I to Regulation (EC) no. 715/2009 of the European Parliament and of the Council on conditions for access to the natural gas transmission networks.

In 2016, the offer and allocation of capacity did not exceed the period associated with the so-called 2016-2017 "capacity allocation year", with the capacity supply always exceeding demand.

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) no. 2015/703 of 30 April 2015.

Following the implementation of the Network Code on Interoperability and Data Exchange Rules, REN and Enagás prepared a new version of the Interconnection Agreement in order to meet the requirements of Commission Regulation (EU) no. 2015/703 of 30 April 2015. The initial Interconnection Agreement proposal was submitted for public consultation between 26 September 2016 and 26 November 2016, and its final version was published early in 2017.

On the one hand, the coordinated implementation of capacity at the VIP, established within the scope of Commission Regulation (EU) no. 984/2013 of 14 October, establishing a network code on capacity allocation mechanisms in gas transmission systems, made the cooperation between the Portuguese and Spanish transmission network operators more effective.

In addition to capacity products, ERSE and CNMC have been taking steps to gradually eliminate the pancaking tariff and promote the mutual recognition of market agents. 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

Development and Investment Plan for the Natural Gas Transmission Network

In 2016, following a public consultation, ERSE prepared its Opinion on the proposal submitted by REN Gasodutos for the Development and Investment Plan of the RNTIAT concerning the period between 2016 and 2025 (PDIRGN 2015).

We should note that the PDIRGN 2015 was submitted by REN Gasodutos in 2015, being subject to public consultation between 18 November 2015 and 4 January 2016. The preparation of an opinion was postponed to 2016, and ERSE indicated that the proposal under analysis should be amended by the RNTGN operator in order to ensure that only three specific projects were submitted for approval, while all the others should contain an express reference to a possible approval in future PDIRGN editions. ERSE

also clarified that, according to the materiality of the impacts on tariffs, it would not approve any revised PDIRGN 2015 proposal that did not consider the suggested postponements, which should take into account the implementation of *Midi-Catalonia* (MIDCAT) in the border between Spain and France.

Development and Investment Plan for the Natural Gas Distribution Networks

Eleven operators of the natural gas distribution networks Setgás, Lisboagás, Lusitaniagás, Beiragás, Medigás, Dianagás, Duriensegás, Paxgás, EDP Gás Distribuição, Sonorgás e Tagusgás) submitted their proposals of Development and Investment Plans for the Distribution Networks concerning the 2017-2021 period to the DGEG.

Then, after asking the various distribution network operators to introduce a number of amendments, the DGEG sent the proposals to ERSE, which is responsible for promoting a public consultation on their contents. The consultation, which was postponed to 2017, took place between 16 March and 2 May; the respective ERSE opinion is due to be published in June 2017.

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

There is currently price formation reference 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 no. 643/2015 to manage the organised gas spot market), did not change the situation. In fact, the start of the 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 form 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 64% of the import balance in 2016) 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 bcm 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 2016, nearly 36% of the natural gas was supplied via loads of LNG predominantly originating in Nigeria.

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

TRANSPARENCY

Although a process is underway to implement the transparency and integrity rules at European level, it is acknowledged 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 October 5th, 2015, in accordance with the schedule provided for in article 12 of the Commission Implementing Regulation (EU) no. 1348/2014 of 17 December, on data reporting implementing Article 8(2) and Article 8(6) of the REMIT.[75].

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 2015 across the entire European Union, in accordance with the schedule laid down in article 12 of the Commission Implementing Regulation (EU) no. 1348/2014 of 17 December, on data reporting implementing Article 8(2) and Article 8(6) of the REMIT, as well as other relevant market information concerning the final assignments of electricity transmission capacity between bidding areas.

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

As the information on the characterisation of 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.

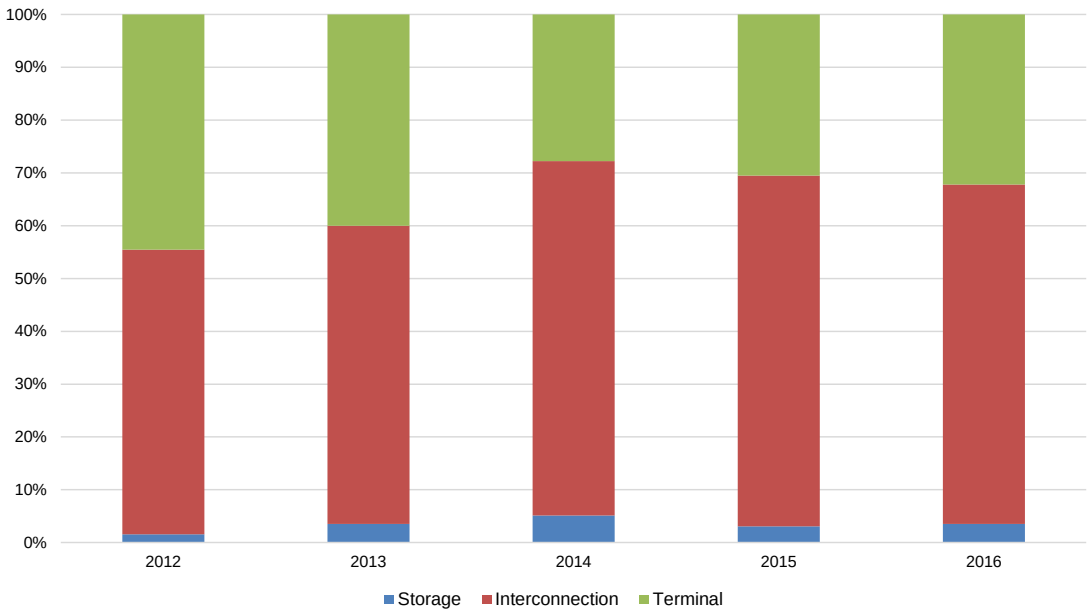
The regulatory review occurred in the natural gas sector in 2016 incorporated specificities related to the application of the REMIT.

COMPETITION EFFICIENCY

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 are described in Figure 4-3. From 2012 onward, there was a gradual reduction in the importance of the terminal as opposed to the use of the interconnection, at both the Campo Maior and Valença entrances, became clearly visible, with the interconnection with Spain being the main supply route in 2016, representing approximately 64% of the total volume of gas contracted.

With regard to the use of the Sines terminal for the introduction of natural gas in Portugal, it is possible that it is being penalised by the fact that, unlike in Spain, in Portugal there is no liquid LNG exchange market, intra and inter-terminal, a circumstance that significantly reduces the storage costs borne by the agents that introduce natural gas via terminals. The implementation of regulated swap mechanisms at the Sines Terminal does not seem to have been enough to counter the tendency towards a decrease in their use.

Figure 4-3 - Breakdown of supply by infrastructure, 2012 to 2016



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

For the 2015-2016 gas year there were no auctions concerning the release excess quantities of natural gas from the SNGN supplier.

NETWORK BALANCING RULES

Considering that the trading of spot products delivered in Portugal via the MIBGAS, S.A. platform is still pending specific regulation, it was approved that, until the aforementioned trading begins, the OMIP platform will 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. During the first three months of implementation of the new natural gas network balancing rules, the transmission network operator was not required to carry out any balancing actions.

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) no. 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 phase-out of regulated tariffs for end customers.

At the end of 2016, more than 96% of natural gas consumption within the conventional segment (excluding standard regime power plants) was being supplied by suppliers on the liberalised market.

At the end of 2016, there were 11 suppliers on the market, 10 of which were operating in the household consumers segment.

By the end of 2016, about 600,000 consumers, from a total of approximately 1.4 million, had switched supplier through the respective platform, most of them from the residential 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

Suppliers send ERSE updated information on the reference prices[76] charged or expected to be charged in the sale of natural gas for all Low-Pressure (LP) supply. 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 for minimum 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.

The information provided to ERSE by suppliers is included in simulation and decision-making support tools for consumers, made available by ERSE on its website.

Furthermore, all natural gas suppliers regularly inform ERSE of the average prices actually charged in the retail market. This information 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).

In December 2016 there were five suppliers operating in the market with a total of 15 mono gas offers, 18 dual natural gas and electricity offers and 21 offers with the sale of additional products, totalling 54 commercial offers for a type of consumer with the following characteristics: couple with children and no central heating (annual natural gas consumption on 292 m^3)[77]. The data shown here concern the most representative consumer type in the household segment in terms of energy consumption.

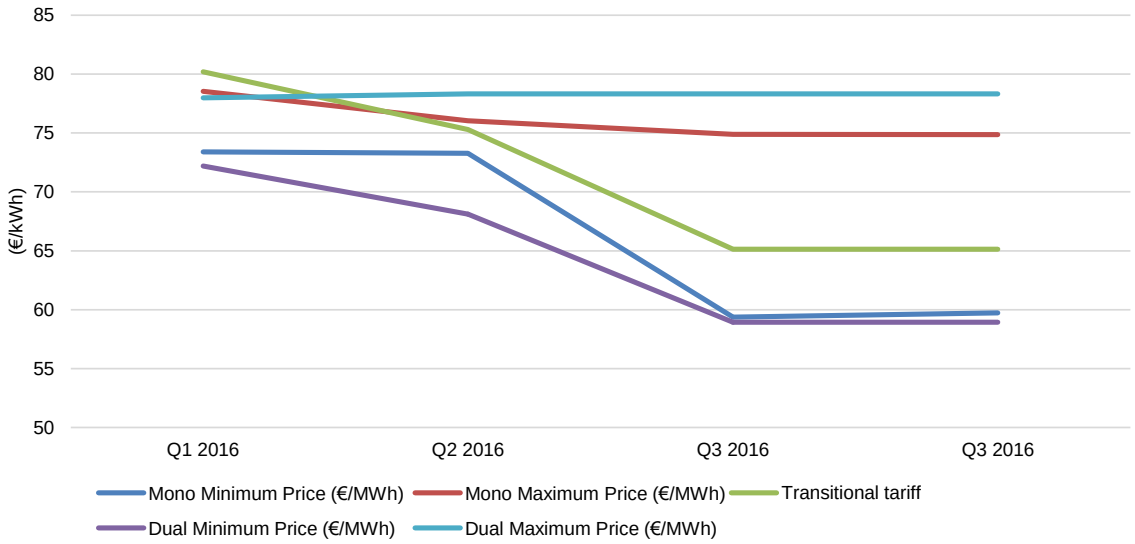
The lowest annual bill corresponded to a dual commercial offer with a value of 201 €/year. The difference between this offer and the most expensive offer is 66 €/year (25%). The mono (natural gas) commercial offer with the lowest value amounted to 203 €/year, corresponding to a discount of approximately 24% compared to the most expensive offer.

Figure 4-4 shows the evolution of (mono and dual) market offers, as well as transitional tariff prices, in 2016. In this period, the maximum prices of the commercial offers remained stable, with a slight decrease in the minimum prices after the 2nd quarter of 2016, which followed the price of the transitional tariff set by ERSE (in July 2016) and the drop in gas prices.

[76] Pursuant to Order no. 3677/2011 of 24 February, available at http://www.erse.pt/pt/legislacao/Legislacao/Attachments/1507/Despacho%203677-2011.pdf.

[77] Consumer type 2.

Figure 4-4 - Price of commercial offers of natural gas (mono and dual) consumer type 2 in 2016



TRANSPARENCY

In order to continuously provide information 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 at its website, which allows comparing the market prices offered in Mainland Portugal [78]for facilities with annual consumptions lower than 10,000 m^3. The price simulator allows comparing the prices offered by all the registered suppliers operating in Mainland Portugal, allowing consumer to choose their supplier by comparing the prices and commercial conditions offered by the various suppliers.

In addition to the simulator, ERSE's webpage also provides all the information on reference prices and other contractual conditions that support the functioning of the simulator[79].

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 accordance 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.

[78] Available since 2012 at http://www.erse.pt/pt/Simuladores/Paginas/simgasnatural.aspx. The Autonomous Regions of the Azores and Madeira are not supplied with natural gas.

[79] The document (which document?) is available at http://www.erse.pt/pt/Simuladores/Documents/PreçosRef_BTN.pdf.

We should add that, under the terms of the Commercial Relations Code, all suppliers that intend to supply customers with annual natural gas consumptions lower than 10,000 m^3 must publicly disclose, namely on their webpages, public offers for the supply of natural gas, as well as the general conditions of the contracts available for these customers[80].

Rules are also in force pertaining to the information to be made available on customer invoices, namely information regarding the invoicing frequency, the portion of access tariffs, the volume of natural gas measured and energy conversion factors (from m^3 to kWh), and [81]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*].[82].

COMPETITION EFFICIENCY

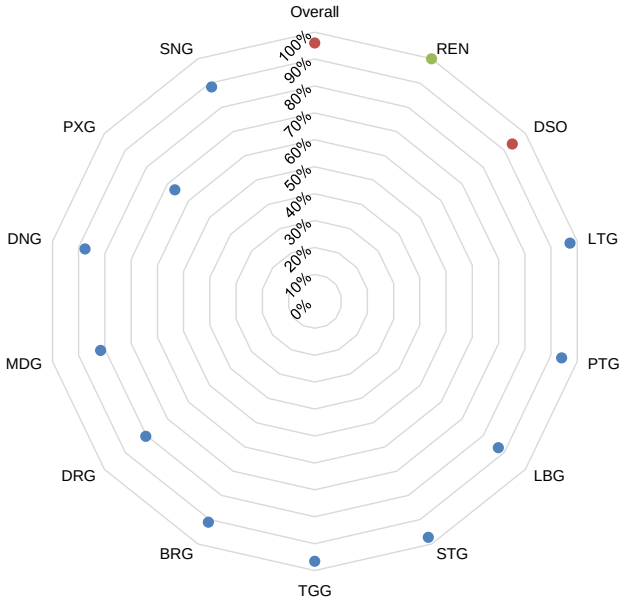
In terms of effective market opening, Figure 4-5 shows the part of the market (in consumption) that was being supplied by suppliers on the liberalised market in 2016. It can be seen that nearly 96% of total consumption, with the exception of power plants, is provided by market suppliers, and this value is generically higher among the leading natural gas distributors.

[80] Pursuant to article 87 of Regulation no. 416/2016 of 29 April, which approves the Commercial Relations Code for the natural gas sector (RRC) available at http://www.erse.pt/pt/gasnatural/regulamentos/relacoescomerciais/Documents/RRC_GN2016_DR.pdf.

[81] Natural gas is billed per kWh, pursuant to article 109 of the RRC.

[82] Approved by Order no. 1801/2009 of 14 January, available at http://www.erse.pt/pt/legislacao/Legislacao/Attachments/812/Despacho%201801_2009.pdf.

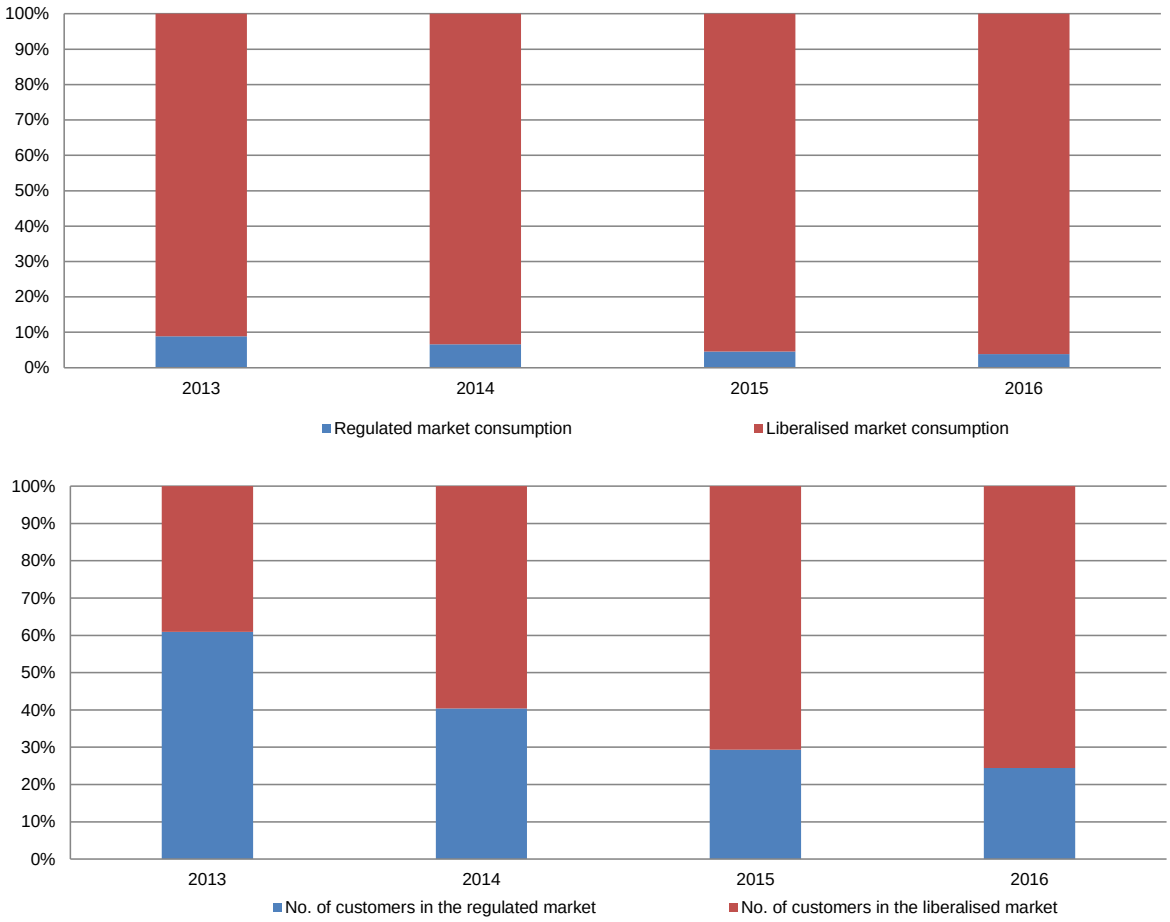
Figure 4-5 - Liberalised market penetration by DSO and TSO (total energy consumption, excluding electricity-generating plants), 2016



Source: REN Gasodutos data. Note: BRG – Beiragás, DNG – Dianagás; DRG – Duriensegás; LBG – Lisboagás; LTG – Lusitaniagás; MDG – Medigás; PTG – EDP Gás Distribuição; 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 4-6, was also due to the phase-out of regulated tariffs that, in January 2013, covered all customers, including the residential ones. This trend meant that consumption on the liberalised market already represented more than 96% of total consumption in 2016.

Figure 4-6 - Breakdown of consumption between the regulated and the liberalised markets, 2013 to 2016

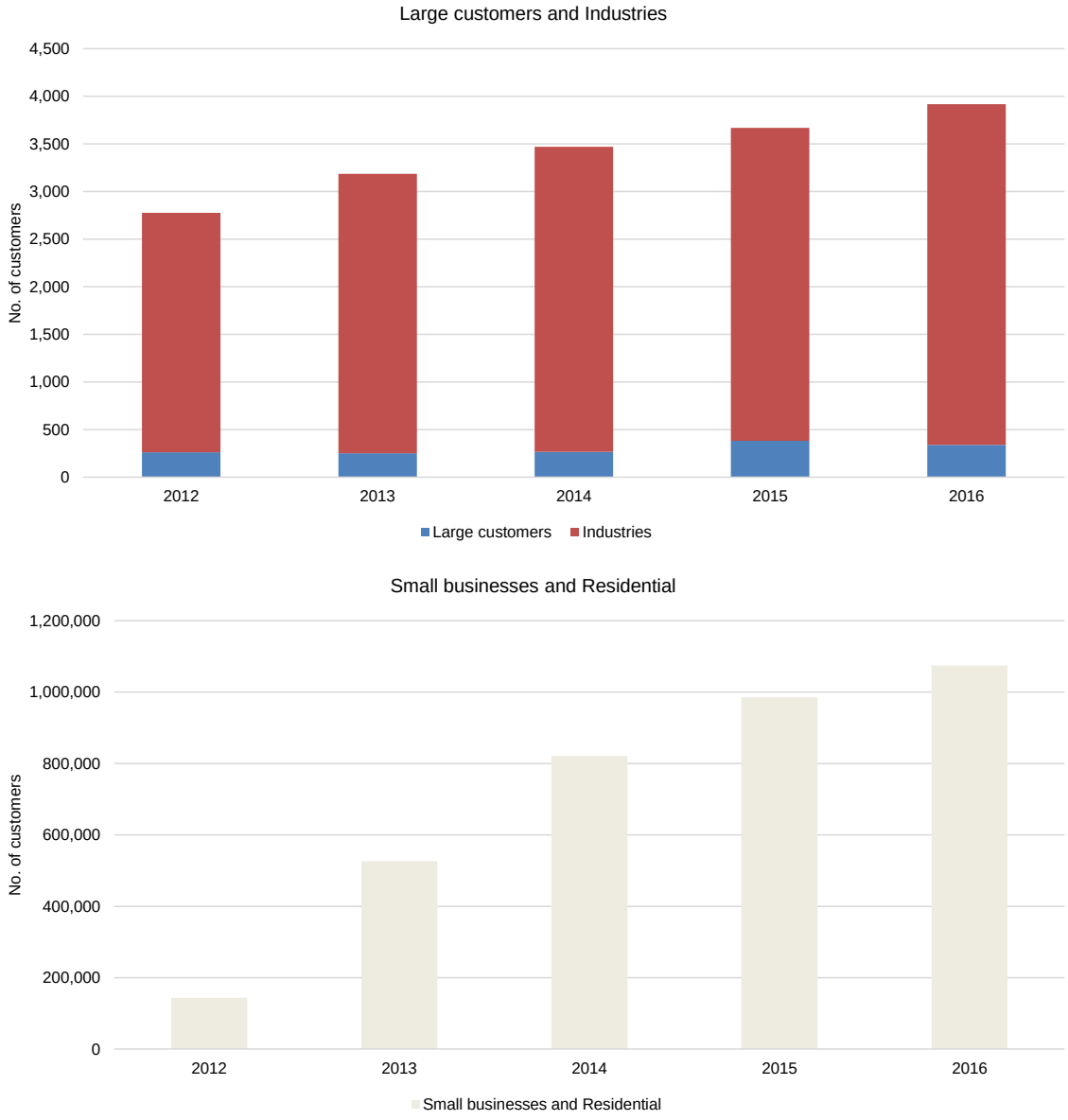


Source: REN Gasodutos data

With regard to the total number of customers, the increase of the market during the period under analysis is mainly due to the continuous entry of residential customers and small enterprises (segments with consumption lower than 10,000 m^3), which, in 2015, increased nearly 9% compared to the previous year (see Figure 4-7). In 2016, approximately 76% of the customers are already on the liberalised market.

In Figure 4-7 we can also see that, in 2016, the segment with the highest consumption, corresponding to large customers with consumptions higher than 1 million m^3, showed a slight decrease of 11% compared to 2015, while the number of industrial customers (with consumptions between 10 thousand m^3 and 1 million m^3) increased 9%.

Figure 4-7- Evolution of the liberalised market in Mainland Portugal, 2012 to 2016

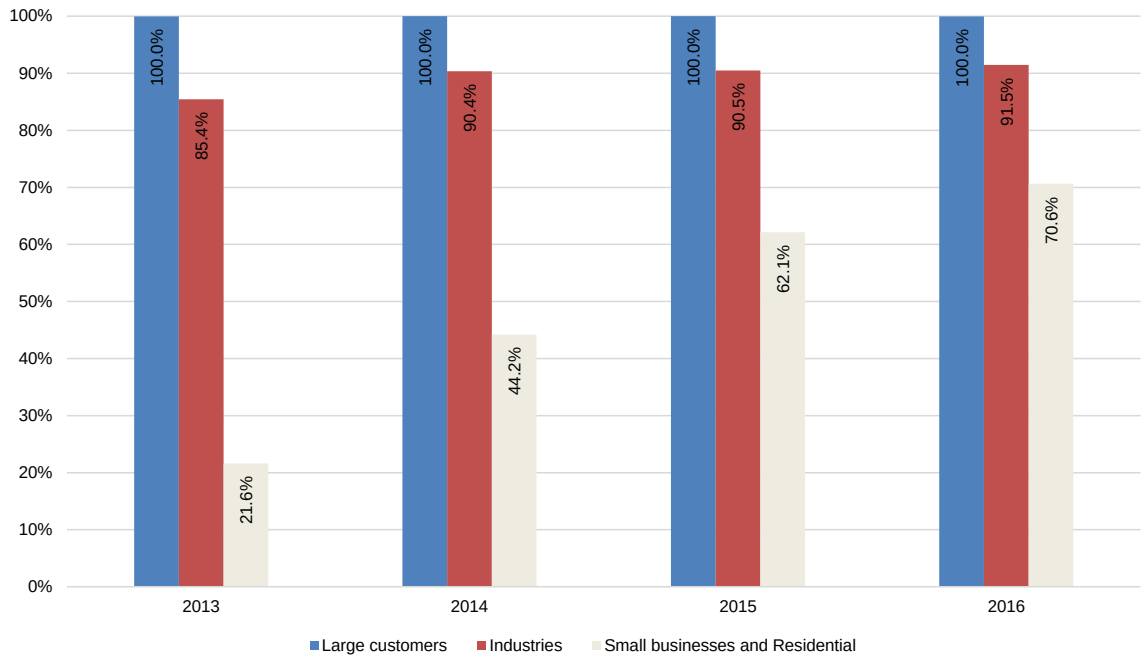


Source: REN Gasodutos data

The consumptions associated with each customer segment of the liberalised market is shown in Figure 4-8, and it is noticeable that, in 2016, the whole of the consumption by large customers was ensured by market suppliers, and the same happened with over 91% of the consumption by industrial customers.

The values specifically relating to the customer segment with annual consumption greater than 10,000 m^3 follow the same rationale as the total customers. It should be noted that, overall, almost 92% of consumption from this group of customers is already being supplied by suppliers on the liberalised market.

Figure 4-8 - Penetration of the liberalised market by customer segment, 2013 to 2016



Source: REN Gasodutos data

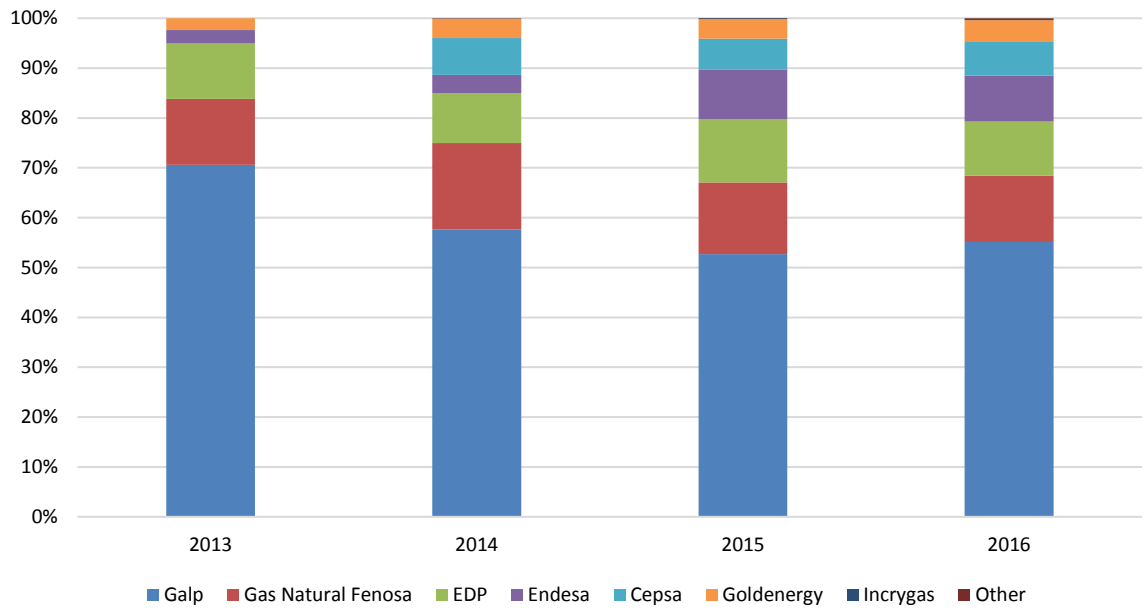
With regard to the liberalised market, an analysis by segment shows that the industrial customers segment is the most competitive one, and the household customers segment is also characterised by a high competitiveness; there was one supplier with a market share of over 50% at the end of 2016, and the number of suppliers continued to increase throughout the year.

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

The growth of the liberalised market and the reduction of the overall corporate concentration in 2016, together with the provision of more and better information to consumers, led to a decrease in the level of concentration in the segment with lower consumptions, i.e., in the household customers segment.

The decrease in Galp Group's market share, the main operator on the natural gas market, visible from 2014 onward, (70% of consumption in 2013), witnessed a slight increase, between 2015 and 2016, to 55%, as we can see in Figure 4-9.

Figure 4-9 - Supply structure in the liberalised market by supplier, 2013 to 2016

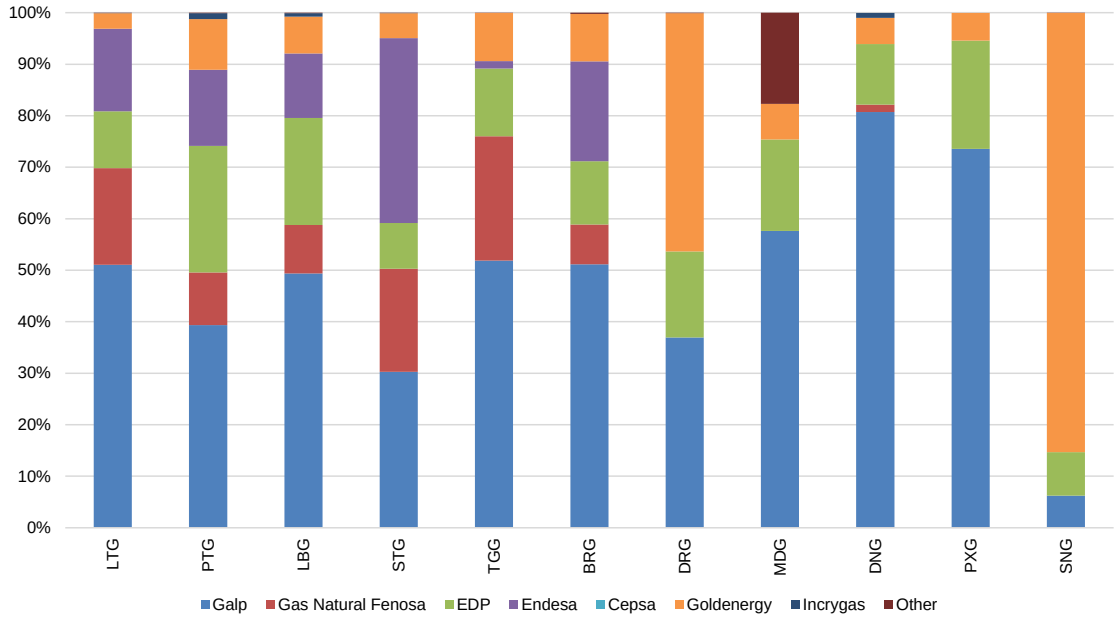


Source: REN Gasodutos data

Supplier switching rates are still high and, in 2016, approximately 20% of the natural gas consumers switched supplier.

Figure 4-10 shows the breakdown of market share by distribution network, in terms of consumption supplied. In 2016, the Galp group had a market share above 50% in more than half of the distribution networks.

Figure 4-10 - Breakdown of consumption supplied by suppliers on the liberalised market and by distribution network, 2016



Source: REN Gasodutos data

In terms of share of natural gas supply share, in 2016, EDP Comercial was the second, assuming the most significant position in the distribution networks operated by EDP Gás Distribuição (PTG), Lisboagás (LBG), Paxgás (PXG) 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 concessioned by Lusitaniagás (LTG), EDP Gás Distribuição (PTG), Lisboagás (LBG), Setgás (STG) and Beiragás (BRG).

In 2016 it was possible to detect inconsistencies in the information provided by one of the DSOs in what regards supplier switching and, therefore, ERSE triggered an independent audit of the information processing and reporting procedures, as well as their traceability, to be carried out by an external entity and due to be completed in 2017.

An analysis of the evolution of the retail market is available on the ERSE website in the form of a quarterly report, which shows the issues of competitive pressure on the market and on each of its segments.

This disclosure is suspended until the completion of the aforementioned audit, in order to ensure the reliability of the data included in these reports.

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

RECOMMENDATIONS FOR SUPPLY PRICES

In the context of regulated tariffs for the sale of natural gas to end users in LP with annual consumption less than or equal to 10,000 m^3 in 2016, ERSE did not issue any recommendations on the conformity of the sales prices under the terms provided for in Article 3 of Directive 2009/73/EC of the European Parliament and of the Council of 13 July.

MEASURES TO PROMOTE EFFECTIVE COMPETITION

Every six months, ERSE collects data for subsequent disclosure, pursuant to Recommendation no. 2/2013 of 1 March, on aspects regarding the contracting of natural gas that are relevant to consumers, the existence and scope of binding periods, the availability of payment methods and the indexation of prices in the liberalised energy market.

The number of offers available to customers with consumption lower than 10,000 m^3 has been increasing, and ERSE felt the need to create more effective conditions for consumer access to the necessary information, with the aim of enabling them to make properly informed choices, namely through Directive no. 6/2015 of 27 April, concerning the aforementioned provision of pre-contractual and contractual information to consumers.

4.3 SECURITY OF SUPPLY

Security of supply is ensured by the Government, which has delegated its monitoring[83] to the DGEG, in cooperation with the National Natural Gas Transmission Network (RNTGN) operator. However, ERSE monitors the evolution of supply and demand in the Portuguese market, the level of expected demand and supply, as well as the conditions that ensure the security of the natural gas supply.

4.3.1 MONITORING THE BALANCE BETWEEN SUPPLY AND DEMAND

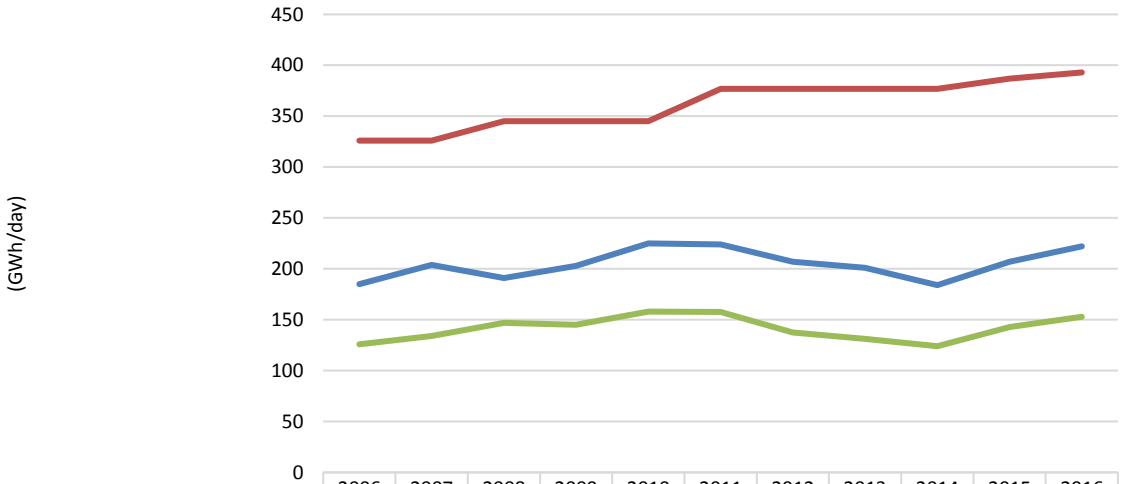
ERSE monitors the allocation of capacity in RNTGN, in particular the level of capacity offered for commercial purposes in comparison to the used capacity.

[83] In accordance with Decree-Law no. 30/2006 of 15 February, as amended by Decree-Law no. 230/2012 of 26 October, and with Decree-Law no. 140/2006 of 26 July, as amended by Decree-Law no. 231-B/2012 of 26 October.

Figure 4-11 shows the evolution of the capacity offered in SNGN[84], the average daily consumption and the annual peak consumption, between 2006 and 2016. In this period, the average daily consumption of natural gas grew, on average, approximately 2% per year. The highest natural gas consumption peak in the SNGN occurred in 2010, with a value of 225 GWh/day.

The figure shows that the daily capacity offer increased between 2006 and 2016, remaining stable between 2008 and 2010 and between 2011 and 2014. Additionally, we can see that the capacity offer in the SNGN was much higher than the daily consumption peak throughout the period under analysis. In 2016, the average daily consumption and the consumption peak represented 39% and 56.5% of the SNGN's entry capacity offer, respectively.

Figure 4-11 - Evolution in the capacity offered in the SNGN, daily average consumption and consumption peaks, 2006 to 2016



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Daily peaks in consumption	185	204	191	203	225	224	207	201	184	207	222
Daily capacity offer	326	326	345	345	345	377	377	377	377	387	393
Average consumption	126	134	147	145	158	158	138	131	124	143	153

Source: REN Gasodutos data

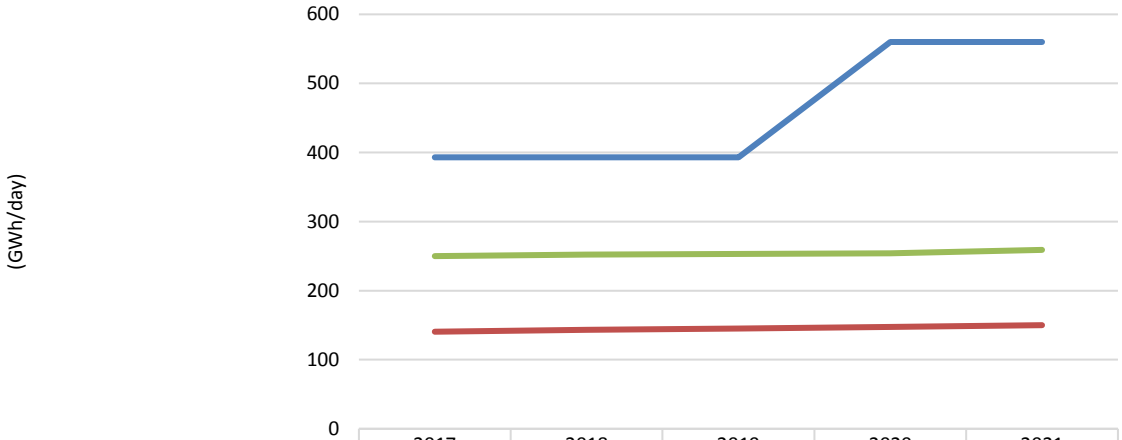
4.3.2 EXPECTED DEVELOPMENTS IN SUPPLY AND DEMAND

Figure 4-12 presents the forecast for the evolution of the capacity offered in SNGN, the average daily consumption and the annual peak consumption, between 2017 and 2021.

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

Based on data from REN Gasodutos, the forecast for the capacity available for commercial purposes is well above the forecast for the use of capacity over the coming years. In 2021, the average daily consumption and the consumption peak are expected to represent approximately 27% and 46% of the SNGN's entry capacity offer, respectively. According to REN Gasodutos' forecasts, the increase in available capacity from 2020 onward results from the 3rd Portugal-Spain interconnection.

Figure 4-12 - Evolution in the capacity offered in SNGN, daily average consumption and consumption peaks, 2017 to 2021



	2017	2018	2019	2020	2021
Forecast for daily capacity offer	393	393	393	560	560
Forecast for average daily consumption	141	143	145	148	150
Forecast for daily peaks in consumption	250	252	253	254	259

Source: REN - 2016 Technical Data and REN Gasodutos -PDIRGN 2016-2025

4.3.3 MEASURES TO COVER PEAK DEMAND OR SHORTFALLS OF SUPPLIERS

The promotion of conditions to cover peak demand or shortfalls of suppliers, as well as security, in the supply of natural gas by the SNGN is based on measures focused on both supply side and demand management side.

Despite the fact that the SNGN continues to depend on a major gas supplier - Algeria (which ensures approximately 65% of the national system's supply)-, the diversification of supply sources was stimulated by the Sines LNG terminal, which entered into operation in 2004.

Another initiative to promote the security of supply and diversification of the supply sources is the integration of the Portuguese market into an Iberian market. Indeed, in 2013, the presence of market agents in SNGN, with significant activity in Spain, led to an increase in the use of the interconnections, with the Portuguese market benefiting from a wider diversification of supply sources such as the Spanish market.

Another way of ensuring safety in natural gas supply is to create and maintain emergency stocks. Based on the findings of the Report on the "Assessment of Risks that affect the supply of Natural Gas in Portugal, 2017-2025 period" (published by the DGEG), the National Transmission Network, Storage Infrastructure and LNG Terminal Network has sufficient storage capacity to allow ensuring all the emergency stock needs.

In addition to the measures adopted to safeguard the security of supply and to meet peak consumption, on the supply side, there are also measures that have been planned and implemented for the demand side, namely the interruptibility of large consumers. Indeed, the power plants of Tapada do Outeiro and Lares have bi-fuel groups, and were granted interruptibility status by DGEG, for the purpose of maintaining natural gas emergency stocks. In this context, it is possible to act on the demand side in a situation of covering peak consumption or when there is a disruption in supply to the SNGN.

5 CONSUMER PROTECTION AND DISPUTE SETTLEMENT

5.1 CONSUMER PROTECTION

In 2016, the protection of the consumers' rights and interests, one of ERSE's general responsibilities, was addressed through measures with different natures and extents. Within this scope, we highlight a series of legislative measures with a direct impact on ERSE's activity, the regulatory works aimed at implementing the legislative options that have been published, the adoption of mechanisms to monitor compliance with the applicable legal and regulatory provisions, as well as the information and clarifications provided to the consumers and the recourse to out-of-court settlement mechanisms to solve disputes arising from commercial and contractual relationships between the providers of electricity and natural gas services and the consumers.

ERSE also verified and monitored the changes introduced by some suppliers on the liberalised market in respect of the general terms of the supply contracts proposed, and those submitted by new suppliers.

With regard to the information given to consumers, in addition to answering individual requests, handled as part of dispute management, ERSE prepares and updates the information content published on the Energy Consumer Portal, which can be found on ERSE’s institutional website.

Also with the objective of providing energy consumers with clearer information, both directly and indirectly, ERSE organises or participates in, at the invitation of other entities, information and training sessions on the issues of greatest concern to electricity and natural gas consumers. In 2016 we highlight, first of all the formal resumption of the ERSEFORMA programme, aimed at employees of public and private entities who are responsible for providing information and assistance to consumers, namely energy consumers, as well as of entities that deal with the alternative resolution of disputes, such as arbitration centres for consumer conflicts. In 2016 there were three training sessions on the following subjects: Energy metering and invoicing; energy contracts; changing energy - contracting dynamics. Additionally, and simultaneously with the aforementioned ERSEFORMA sessions, ERSE developed the "Ligue à Ficha" [Connect the Plug] initiative, which involved the preparation of 45 informative sheets with frequently asked questions on the various training topics, which were provided to trainees and to the general public.

As far as the resolution of conflicts of a commercial and contractual nature is concerned, ERSE employs mediation and conciliation procedures, whereby it can recommend the resolution of disputes or suggest to the parties that they find a mutually agreeable solution, but it may not impose these measures on the parties involved. Simultaneously, ERSE encourages the use of arbitration, particularly if supported by the existing consumer dispute arbitration centres. The following section includes more detailed information on the handling of complaints by ERSE in 2016.

5.2 DISPUTE SETTLEMENT

ERSE directly intervenes in the resolution of disputes by encouraging the use of voluntary [85]arbitration and making use of other mechanisms for settling disputes on a voluntary basis, whereby it can recommend the resolution of specific cases.

ERSE promotes frequent inspections of records of complaints and of the installations of the electricity and natural gas suppliers to assess their compliance with the law and sector codes, particularly in relation to specific obligations relating to the Complaints Book.

In 2016, ERSE played an active role in a pilot project, managed by the Directorate-General for Consumers, aimed at implementing a single consumer access platform to allow consumers to exercise their rights to be informed and to make complaints, in this case against the providers of essential public services. In addition to ERSE, the national communications authority (ANACOM) and the water and solid waste regulator (ERSAR) are also involved in the aforementioned project. This measure, which includes the creation of the Electronic Complaints Book, is expected to come into force on 1 July 2017.

In 2016, ERSE's information and support service for energy consumers recorded a total of 25,949 consumer request files. Approximately 95% of this total corresponded to the number of complaints received (24,681), against only 5% of information requests (1,268).

Of the total of complaints received, 11,571 were lodged via the Complaints Books of the companies in question; 8,911 of the complaints were related to the electricity sectors, 1,778 to the natural gas sector and 882 to the dual supply of energy (electricity and natural gas); in the latter case, the complaints were only lodged in the 2nd semester of 2016.

One of the changes introduced by the new complaint handling system, implemented in January 2016, was precisely this tripartite classification: electricity, natural gas and dual, thus responding to the growing number of requests sent to ERSE with regard to single dual supply contracts.

Approximately 1/3 of the complaints received in the electricity sector during the year under analysis concerned invoicing, followed by issued regarding contracting and metering (meter operation, meter readings, etc.) In the natural gas sector, in addition to billing, the occurrence of interruptions of supply ranked second in terms of number of complaints.

[85] In the case of an essential public service, such as the supply of electricity and natural gas, if the consumer, as a natural person, expressly chooses to refer a case to an arbitration centre for consumer conflicts, arbitration becomes mandatory for the network operator or supplier involved in the dispute with the consumer (necessary arbitration).

The main targets of complaints from energy consumers were, in the same year, the suppliers (including last resort suppliers), which received approximately 80% of the complaints, while the other 20% of the complaints were addressed to distribution network operators.

Furthermore, in 2016 ERSE received a total of 1,268 information requests, from which we highlight the requests for information on unspecified subjects (including questions about the organisation of the different sectors, legislation and regulation, among others), followed by requests of information on tariffs and prices.

Every business day, from 3 p.m. to 6 p.m., ERSE's energy consumer information and support service provides information via a dedicated low-cost telephone line.

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.).

ERSE has been constantly monitoring and supervising compliance with the conditions of the certification that was granted ever since. Within this scope, we should highlight the reporting of an incompatibility between the exercise of rights and the appointment of a member of the board of directors of REN SGPS by Gestmin SGPS, S.A. and the launch of electricity and natural gas trading activities by OZ Energia, a company that is also controlled by Gestmin SGPS, S.A.. This situation was solved by the TSO and led to the suspension of member appointed by that shareholder for the board of directors, as well as of all the corresponding non-ownership rights. In May 2016, Gestmin left the company's governing bodies and, after 27 July 2016, following a sale of shares, it no longer has qualifying holdings in REN.

6.2 LEGISLATIVE DEVELOPMENTS

In the scope of the powers attributed by its Statutes and other legislation applicable, ERSE has met the obligations inherent to its capacity as regulator, such as:

- Approves codes;
- Issues binding decisions on natural gas companies;
- Carries out surveys on the functioning of the natural gas markets;
- Has the capacity to demand, from natural gas companies, information relevant to the fulfilment of its functions;
- Requests and promotes the conducting of audits to companies subject to regulations issued by ERSE;
- Develops other supervision and inspection activities;
- Sanctions behaviours by natural gas companies that constitute administrative offences;
- Promotes information and clarification for natural gas consumers, handles their grievances and complaints and intervenes in extrajudicial dispute resolution;
- Issues opinions on matters requested by the Government, Parliament or other public administration entities.

As part of its supervisory responsibilities, in 2016, highlight goes to the following initiatives undertaken by ERSE:

- Verification and analysis of the general conditions of natural gas supply contracts concluded with suppliers on the liberalised market.
- Verification and analysis of commercial offers made available by suppliers under the liberalised market.
- Monitoring of flows between regulated and non-regulated activities, through the analysis of transfer pricing.

In 2016, ERSE published the following regulations within the scope of the natural gas sector:

- Commercial Relations Code;
- Access to Networks, Infrastructures and Interconnections Code;
- Tariff Code;
- Infrastructure Operation Code.

Within the scope of regulatory measures, we highlight the following legislative instruments approved by ERSE in 2016:

- Possibility of supplying electricity to occasional facilities (fairs, circuses, etc.) via the last resort supplier in the absence of market offers (Directive no. 3/2016 of 15 January)
- Approval of the Measuring, Reading and Data Availability Guide [Guia de Medição, Leitura e Disponibilização de Dados] for the electricity sector (Directive no. 5/2016 of 26 February).
- Transitional tariffs applicable to natural gas consumers that are still being supplied by a last resort supplier (Directive no. 9/2016 of 4 May).
- Procedures established in the Measuring, Reading and Data Availability Guide [Guia de Medição, Leitura e Disponibilização de Dados] for the electricity sector. (Directive no. 11/2016 of 9 June)
- Information to be mandatorily included in the electricity bill (Directive no. 14/2016 of 26 July).
- Approves the entities authorised to integrate the trading imbalance unit pursuant to the Procedures Manual for a Global System Management. (Directive no. 17/2016 of 7 August)
- Procedures Manual for a Global System Management of the SNGN and provisions concerning the application of the corresponding transitional regime. (Directive no. 18/2016 of 27 October)

As part of the Energy Sector Penalty System, approved by Law no. 9/2013 of 28 January, in 2016, ERSE received 40 complaints and opened 9 infraction proceedings (electricity and natural gas).

6.3 ELECTRIC MOBILITY

All the charging stations in public domain accessible to the public are integrated into the MOBI.E pilot network. This network will comprise 1604 regular charging stations and 50 fast charging stations, which are expected to be installed by the end of 2018.

The mandate given to MOBI.E, S.A., responsible for managing the electric mobility network, initially until the end of 2014, was extended to 12 June 2018, being renewable for periods of at least one year.

Additionally, the legislation assigned MOBI.E the following competences:

- Launch the procedure for the management, operation and maintenance of the stations covered by the 2nd phase of the MOBI.E Pilot Network (planned for the period between 2016 and 2018), also under its responsibility.
- Award, via a tender procedure to be implemented until the end of 2018, the operation and maintenance of the charging stations to dedicated operators; once this process is completed, MOBI.E will no longer be considered a pilot network.

In 2016, ERSE initiated and developed contacts with the Electric Mobility Network Managing Authority (EGME), with a view to promoting the creation of the Procedures Manual for the EGME[86], provided for the in Electric Mobility Code.

On its own initiative, ERSE started implementing a pilot project in the field of electric mobility in its facilities, establishing the figure of the owner of a private charging station for private use, provided for in the legislation, which can have a potentially broader use in condominiums. This figure allows separating electricity consumptions associated with electric mobility from other energy consumptions in condominiums. In 2016, ERSE also published the electric mobility tariff prices.

[86] This Procedure Manual (MP), which is publicly disclosed, shall include a clear description of the energy and invoicing information flows that involve the various stakeholders, such as Suppliers, the DSO and the owners of electric vehicles. Additionally, the MP shall include information flows concerning service quality and a description of the set of information to be provided to ERSE.

ANNEXES

I. LIST OF ABBREVIATIONS AND ACRONYMS

ACE - Energy Consumers Support Office in ERSE

ACER - Agência de Cooperação dos Reguladores de Energia (Agency for the Cooperation of Energy Regulators)

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*

CMVM - Comissão de Mercados e Valores Mobiliários (Portuguese Securities Market Regulator)

CNMV - *Comisión Nacional de Mercados de Valores*

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

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 (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)

LNG - Liquefied Natural Gas

LP - Low Pressure (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)

MIBEL - Iberian Electricity Market

MIBGAS - Iberian Natural Gas Market

MP - Medium pressure (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

PDBF - Base Daily Operating Schedule

PNBEPH - National Programme of Dams with Significant Hydroelectric Potential

RARII - Access to NetworkNetworks, Infrastructures and Interconnections Code

REN - Rede Eléctrica Nacional, S.A.

RNT - National Electricity Transmission Network

RNTGN - National Natural Gas Transmission Network

RNTIAT - National Transmission Network, Storage Infrastructure and LNG Terminal Network

RQS - Quality of Supply Code

RRC - Commercial Relations Code

RT - Tariff Code

SEN - National Electricity System

SLR - Last-Resort Supplier

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

TR - Real Time

TSO - Transmission System Operator

VIP - Virtual Interconnection Point

II. LIST OF LEGAL DIPLOMAS

A. NATIONAL LEGISLATION

In 2016, the -following legislative initiatives are worth highlighting:

- Law no. 7-A/2016 of 30 March, which approved the 2016 State Budget. This law made significant changes to the social tariff regime in force for electricity supply services (Decree-Law no. 138A/2010 of 28 September, as amended by Decree-Law no. 172/2014 of 14 November) and natural gas supply services (Decree-Law no. 101/2011 of 30 September), establishing, first of all the automatic assignment of the social tariff, without the need for economically vulnerable customers to explicitly request its application. This automatic assignment process was coordinated by the DGEG, with the active participation of the network operators and the suppliers. ERSE continued to be responsible for ensuring compliance with the rules applicable to the social tariff, in addition to cooperating in the public dissemination and clarification of the new legal framework.
- Decree-Law no. 7/2016 of 22 February, which introduces the third amendment to Decree-Law no. 195/99 of 8 June, thus extending the deadline for the submission of requests for the refund of deposits associated with essential public services, such as electricity and natural gas, to consumers.
- Order no. 178-B/2016 of 1 July, which approved the new procedures, model and other conditions required to apply the social tariff for electricity supply.
- Order no. 178-C/2016 of 1 July, which approved the new procedures, model and other conditions required to apply the social tariff for natural gas supply.
- 2017 State Budget Law (Law no. 42/2016 of 28 December), which launched the works that will lead ERSE's responsibilities to be extended to the National Oil System (SPN), which includes the liquefied natural gas (LNG) sector, in all its categories (bottled, piped and in bulk), the petroleum-derived fuels sector and the bio-fuels sector. Among other measures, this law provides also for the creation of the Logistic Operator for Supplier Switching (OLMC), common to the SEN and the SNGN, as a legal and functionally independent entity, responsible for the suppler switching process and for its security, effectiveness and promptness, as well as for providing consumers with information on consumption data, meter readings and measuring equipment management.
- Order no. 268-B/2016 of 13 October - Approves the duty of the SLR of the National Electricity System to deduct from the electricity produced under the special regime that benefits from a guaranteed remuneration, the values received by the electricity-generating plants that benefited cumulatively from supports to the promotion and development of renewable energies via other public supports.
- Order no. 42-A/2016 of 9 March - Defines the reference tariff applicable in the current year to the electricity that is entirely sold to the public service electricity network (RESP), generated by small production units (UPPs) that use renewable energy sources.

- Order no. 5138-A/2016 of 14 April - Determines the discount applicable to social electricity network access tariffs from 1 July 2016 onward.
- Order no. 5138-B/2016 of 14 April - Determines the discount applicable to social natural gas tariffs.
- Order no. 10840/2016 of 5 September - Determines that the mechanism for the calculation of ancillary service prices and the proportionality of the quantities offered by the CMEC plants shall remain in force until the end of the annual CMEC revisibility mechanism.
- Order no. 11946-A/2016 of 6 October - Establishes the discount applicable to social electricity network access tariffs for economically vulnerable end customers from 1 January 2017 onward.
- Resolution of the Council of Minister no. 33-A/2016 of 9 June - Creates the conditions for the automatic application of the social electricity and natural gas tariff, establishing the exchange of information between the competent Public Administration services.
- Order no. 173/2016 of 21 June - Establishes the terms and conditions for the allocation of power for the injection of electricity in a specific RESP point applicable within the scope of the special mode of the scheme for the remuneration of licensed cogeneration production.

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

- Law no. 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 no. 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 no. 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 July 2003.
- Decree-Law no. 57/2015 of 23 September, which amends Decree-Law no. 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 no. 2005/29/EC of the European Parliament and of the Council of 11 May 2005.

- Decree-Law no. 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 no. 15/2015 of 30 January, which amends Decree-Laws no. 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 m^3 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 no. 2/2015 of 6 January, which amends Decree-Law no. 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.
- Decree-Law no. 172/2014 of 14 November, which introduces the first amendment to Decree-Law no. 138 -A/2010 of 28 December, which creates the social tariff for the supply of electricity, and the first amendment to Decree-Law no. 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 no. 231/2012 of 26 October, which introduces the third amendment to Decree-Law no. 140/2006 of 26 July and concludes the transposition of Directive no. 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 no. 230/2012 of 26 October, which introduces the fifth amendment to Decree-Law no. 30/2006 of 15 February and completes the transposition of Directive no. 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) no. 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) no. 1775/2005, and Regulation (EU) no. 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 no. 172/2006 of 23 August, and completes the transposition of Directive no. 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 no. 29/2006 of 15 February, transposing Directive no. 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 October 1st, 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.
- Order 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).
- Order no. 237/2015 of 12 August, which amends Order no. 278-C/2014 of 29 December, which defined new procedures and conditions for the granting, application and maintenance of the social tariff.
- Order no. 108-A/2015 of 14 April, which defines the mechanism for determining the aggravating factor included in the transitional tariff of sale to end customers of natural gas.
- Order 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 m^3 and for electricity with consumptions in normal low voltage.
- Order no. 251-B/2014 of 28 November, which introduces the second amendment to Order no. 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 overall 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.
- Regulation no. 557/2014 of 19 December, which approves the Commercial Relations Code for the electricity sector.
- Regulation no. 551/2014 of 15 December 2014, which approves the Tariff Code for the electricity sector.
- Regulation no. 455/2013 of 29 November, which approves the Service Quality Code for the electricity sector and the corresponding Procedure Manual.
- Regulation no. 139-C/2013 of 16 April, which approves the Access to Networks, Infrastructures and Interconnections Code (RARII).

- Regulation no. 139-A/2013 of 16 April, which approves the Quality of Service Code for the 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 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.
- Directive no. 14/2014 of 4 August, of ERSE, which approves the Procedure Manual for Access to Infrastructures (MPAI).
- Directive no. 23/2013 of 22 November, of ERSE, on image differentiation in the electricity sector.
- Directive no. 21/2013 of 22 November, of ERSE, which approves the deadlines for the classification of Exceptional Events and for providing information to ERSE.
- Directive no. 20/2013 of 22 November, of ERSE, which approves the Parameters for Service Quality Regulation.
- 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 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. This order amends Order no. 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, with 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 (EU) 2015/1222 of 24 July 2015, establishing a guideline on capacity allocation and congestion management.

- Commission Regulation (EU) 2015/703 of 30 April 2015, establishing a network code on interoperability and data exchange rules.

- Commission Implementing Regulation (EU) no. 1348/2014 of 17 December 2014, on data reporting implementing Article 8(2) and Article 8(6) of Regulation (EU) no. 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) no. 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. 994/2010 of the European Parliament and of the Council of 20 October 2010, concerning measures to safeguard security of gas supply and repealing Council Directive 2004/67/EC.

- 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 (EC) No 1228/2003.

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.