





















## SYSTEM ADJUSTMENT SERVICES IN THE SPANISH PENINSULAR ELECTRICAL SYSTEM (GWh)

|   | 2016    |           | 2017    |           | Δ % 2017/2016 |           |
|---|---------|-----------|---------|-----------|---------------|-----------|
|   | Upwards | Downwards | Upwards | Downwards | Upwards       | Downwards |
| Supply guarantee constraints                                    | -       | -         | -       | -         | -             | -         |
| Supply guarantee constraints Technical constraints <sup>3</sup> | 11.834  | 181       | 11.035  | 739       | -6,8          | 308,7     |
| Additional Upward Power Reserve <sup>4</sup> (GW)               | 1.996   | -         | 1.559   | -         | -21,9         | -         |
| Secondary reserve availability <sup>5</sup> (MW)                | 682     | 509       | 682     | 514       | 0             | 1,0       |
| Secondary reserve usage   | 1.530   | 1.012     | 1.203   | 1.206     | -21,3         | 19,2      |
| Tertiary reserve  | 2.557   | 1.553     | 2.348   | 1.806     | -8,2          | 16,3      |
| Deviation management service                                    | 1.183   | 465       | 1.006   | 760       | -15,2         | 63,3      |
| Real time constraints <sup>6</sup>                              | 390     | 645       | 207     | 434       | -46,9         | -32,7     |

**Table 2. System Adjustment Services in the Spanish Peninsular Electrical System (years 2016-2017)**

**Source: REE**

### Network security and reliability rules

CNMC reports on 'Operational Procedures' (O.P.'s) dealing with security and reliability rules, specifically the ones included in 'Series 1' (1.1 to 1.6, thus establishing criteria on admissible loads, voltage / reactive power control, frequency / regulation capacity reserve, black-start capabilities, etc.).

Act 3/2013 entitled CNMC to monitor the compliance with network security and reliability rules. As for transmission service quality index, their measured values and reference limits are determined by Royal Decree 1955/2000, namely: non-supplied energy (ENS), mean interruption time (TIM, equal to ENS over average load in the system) and grid availability index (ID). The following table shows last available data regarding TIM and ENS, for the peninsular system and for Canary and Balearic Islands.

<sup>3</sup> Technical constraints applied to 'Base Functioning Programme' as established by system Operational Procedure 3.2 (P.O.3.2).

<sup>4</sup> Total annual additional upward reserve, in GW.

<sup>5</sup> Average available hourly capacity, in GW.

<sup>6</sup> Includes energy re-dispatches through the submarine DC interconnection between Peninsular and Balearic Electrical Systems.







capacity installed. The ‘investment remuneration term’ ( $R_{inv}$ ) is therefore defined in (€/MW) and is aimed at providing for the part of capital expenditure (CapEx) deemed not recoverable via income from energy sale at market prices. For those technologies where market price is deemed also insufficient so as to cover regular operational expenditure (OpEx), an ‘operation remuneration term’ ( $R_o$ ) defined in (€/MWh) is also provided. Plants located in non-peninsular territories, where conventional production costs are substantially higher than in mainland Spain, are eligible for an additional ‘investment incentive term’ ( $I_{inv}$ ), again in (€/MW), proportional to expected savings with regard to present average production costs in that particular territory.

‘Full (and half) regulatory periods’ are defined to last six and three years, respectively. Only regulatory lifetime (in years) and standard investment rate (in €/MW) are established once and for all for each ‘reference facility’. Adjustments linked to the evolution of power market prices departing from their expected average values are fine-tuned every three years (in the case of cogeneration and waste, assumed fuel prices reviewed at least once a year). The rest of parameters—including the above mentioned remunerative terms and the estimated rate-of-return, which is linked to the 10-year sovereign bond plus 300 basis points—are subject to revision every full regulatory period (i.e. every six years).

The Ministerial Order IET/1045/2014 of 16 June establishes the remunerative parameters for the more than 1.300 ‘reference facilities’ the order itself defines. This disposition, combined with the Royal Decree 413/2014 and the Royal Decree-law 9/2013, has economic effects since July 2013.

The Royal Decree 900/2015 of 9 October established the economic and technical conditions of self-consumption (regulation applies also to non-renewable based self-consumption). Since a number of system costs are paid in proportion to energy consumed (the so-called *volumetric* component of the tariff), the Decree foresees a charge on energy instantaneously self-consumed to recover such costs. Two types of self-consumption are defined: ‘type 2’ applies whenever the generator is independently registered as a stand-alone producer, although its production is injected via a consumer’s private, internal grid; ‘type 1’ applies if just a consumer exists (which happens to have an adjoining generation facility). Type 1 self-consumers are not allowed to sell surplus energy, although exemptions are granted to those with contracted power up to 10 kW or located in off-shore (non-peninsular) systems<sup>7</sup>.

In accordance with aforementioned Royal Decree 413/2014, the support scheme for new RES generation plants must be granted by a tendering process. Hence, on the 14th of January 2016 the first RES auction was conducted in Spain including volumes for wind (500 MW) and biomass (200 MW) technologies. In 2017, two more tendering processes were carried out: The 17<sup>th</sup> of May 2017, a technological neutral tender resulted in 3000 MW of new projects, 99% from wind technology. Two months later, the 26<sup>th</sup> of July 2017, there was a tender for solar PV and wind plants, with the result of 3909 MW and 1128 MW, respectively. All projects involved in the three tenders total almost 9 GW of new renewable capacity installed. CNMC was designated as supervisor of the processes; participants bid a discount, in percentage, on the financial support

<sup>7</sup> A reduced charge is applied to Mallorca-Menorca subsystem in the most expensive Time-of Use period (out of the existing six ones).

to be granted in terms of [€/MW installed]. The final result of all tenders was a zero support scheme level for all technologies, which involves that these plants will get their revenues exclusively from sales to the power wholesale market, and there is no regulated additional cost for the system derived from the auction. However, new future challenges are open: provided certain RES-based plants are viable without incentives, the design of the wholesale market is more than ever a critical point for their profitability, as well as connection and access processes needed to guarantee an orderly, gradual increase in the deployment of new RES plants.

### 3.1.3 Network tariffs for connection and access

The Spanish Power Sector Act, 24/2013, dated December 26<sup>th</sup>, modifies the access tariff system, previously determined by the former Power Sector Act 54/1997. In line with the provisions of Directive 2009/72/EC, the new framework establishes a differentiation between network tariffs, aimed at recovering transmission and distribution costs, and those charges recovering the rest of regulated costs, such as subsidies to renewables and cogeneration.

According to Act 24/2013, article 16 defines that CNMC is responsible for elaborating the methodology for the calculation of transmission and distribution network tariffs, in accordance with transparent, non-discriminatory and cost-reflective criteria and the Government will elaborate a methodology relating to the other charges mentioned in the previous paragraph.

However, the above, fourth additional transitory provision of Act 24/2013 establishes that until the Spanish Government develops the methodology of charges, these will be paid by consumers through the access tariffs.

In July 2014, CNMC approved the methodology for electricity transmission and distribution network tariffs. This methodology is based on the efficient allocation of transmission and distribution costs to electricity consumers and producers. The network tariff structure is the result of the allocation methodology.

Act 32/2014, of 22 December, on Metrology, modifies the Power Sector Act, 24/2013, setting that the legal authority to establish the structure and conditions applicable to the access tariffs for transmission and distribution networks corresponds to the Government.

In this way, Royal Decree 1054/2014 introduced a new voltage division for access tariffs for six periods determined in Royal Decree 1164/2001, of 26 October, establishing tariffs for accessing the electricity transmission and distribution networks. According to this new regulation the 6.1 tariff, which covered voltages from 1 kV to those less than 36 kV, was divided into a first level for voltages greater than or equal to 1 kV and less than 30 kV and another level for voltages from 30 kV to less than 36 kV.

The regulatory changes introduced by Act 32/2014 mean that the CNMC methodology passed in July 2014 is not in force currently.

### 3.1.4 Cross-border issues

#### Access to cross-border infrastructure, including the procedures for the allocation of capacity and congestion management

Circular 2/2014 of CNMC establishes since 12th of March 2014 the terms and conditions for access to cross-border electricity infrastructures and the methodology for cross border balancing exchanges Regulation of cross border exchanges, according to Order IET/107/2014 and Act 3/2013.

This framework establishes a first step in the implementation of the target models for long term, day-ahead and intraday cross-border capacity allocation connecting the Iberian market (Spain and Portugal) with the rest of Europe. The methodology considers long term capacity allocation through a European platform, day-ahead market coupling and balancing exchanges (performed through the BALIT platform).

In the context of day-ahead capacity allocation, after the full coupling with NWE on 13th May 2014 Spain and Portugal are now part of the PCR project that serves as the base for the common day-ahead electricity market in the EU target model.

During 2016, 2017 and first semester of 2018 several proposals from NEMOS (Nominated Electricity Market Operator) and TSOs (transmission system operators): have been submitted to national regulatory authorities (NRAs) as requested by Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a Guideline on Capacity Allocation and Congestion Management (CACM GL).

Most of them are already approved like those methodologies referring to products, maximum and minimum prices, intraday cross-zonal gate opening and closure times, congestion income distribution, market coupling operation functions, day ahead firmness deadline, common grid model, generation and load data provision. While others are currently under evaluation as it is the case of intraday capacity pricing, algorithm, SWE (southwest Europe) capacity calculation methodology, SWE redispatching and countertrading and SWE fallback methodology in case of decoupling.

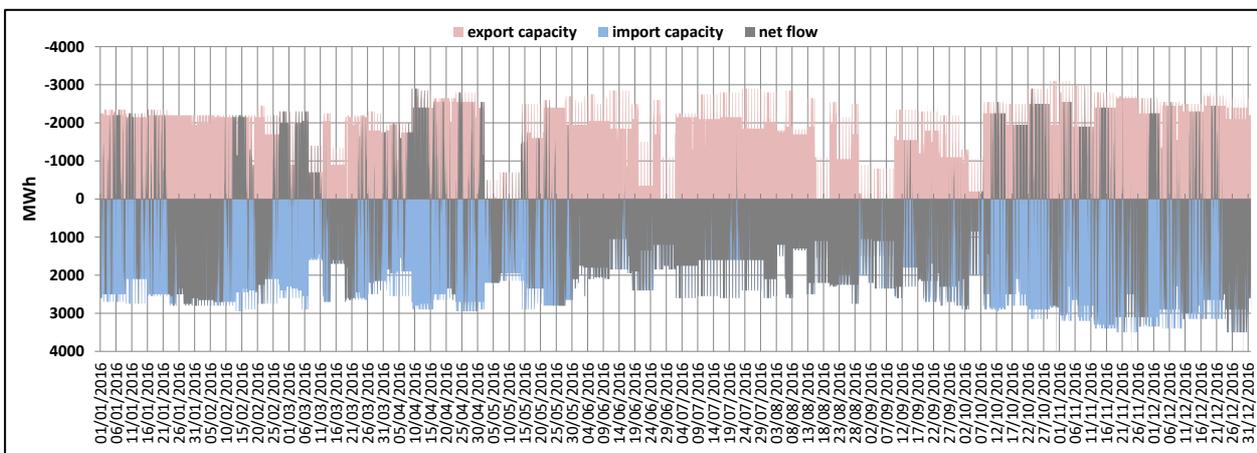
As regards to intraday capacity allocation, implicit continuous allocation has been implemented in June 2018 on ES-PT and ES-FR borders, in the context of the so-called XBID project, where the Iberian NEMO, which is the Iberian Electricity spot Market Operator (OMIE) participates. Since that date, explicit intraday allocation is not used anymore in the ES-FR border as the general process. And will be only used for the fallback procedures with SAR.1.3 rules (SAR 1.4 for 2019).

In February 2017 OMIE, REE and REN launched a common proposal for complementary auctions for the Spanish-Portuguese bidding zone border, as a hybrid model of continuous trading through the XBID. After a public consultation and a request for amendment asking for CACM guideline compliance, Spanish and Portuguese NRAs approved, in April 2018, the Iberian NEMO and TSOs proposal for the Spanish-Portuguese Complementary Regional Intraday Auctions, in accordance

with the Article 63 of Commission Regulation (EU) 2015/1222 of 24 July 2015, establishing a guideline on capacity allocation and congestion management.

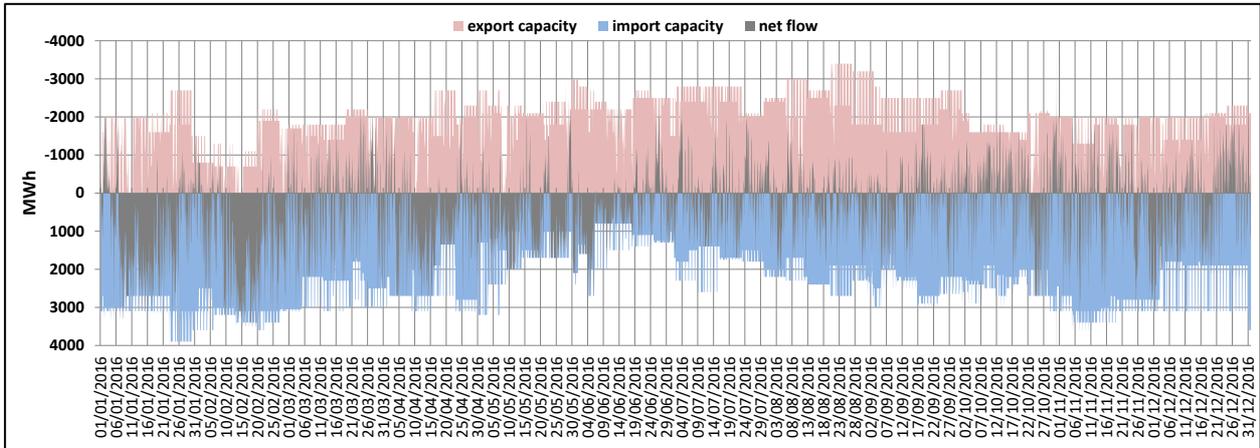
Furthermore, in June 2018 the CNMC and ERSE approved the specifications and development procedures of the complementary intraday regional auctions between Spain and Portugal, containing details about the implementation of the intraday Regional Auctions.

On the other hand, on April 2017, according to Commission Regulation (EU) 2016/1719, of 26 September 2016, establishing a guideline on forward capacity allocation, the National Regulatory Authorities (NRAs) received a set of proposals of the TSOs related to harmonised allocation rules for long term transmission rights (the HAR), the establishment and the cost sharing methodology of the Single Allocation Platform (SAP), the regional design of long term transmission rights and the regional specific annexes for the HAR. The HAR was adopted by ACER Decision Nº 3/2017, of 2 October 2017, on the electricity Transmission System Operator's proposal for Harmonised Allocation Rules for Long-Term Transmission Rights. On 18 September 2017, all NRAs approved the TSOs' proposal for the single allocation platform methodology and sap cost sharing methodology. Finally, on 10 October 2017, the South-West Europe (SWE) NRAs approved the SWE TSOs' proposal for a SWE Regional Annex to the HAR and the SWE TSOs' proposal for the design of long term transmission rights on SWE.



**Figure 3. Exchange capacity and market matched energy between France and Spain in day ahead trading in 2016**

Source: CNMC



**Figure 4. Exchange capacity and market matched energy between Portugal and Spain in day ahead trading in 2016**

Source: CNMC

| MWh         | export capacity | import capacity | export     | import     |
|-------------|-----------------|-----------------|------------|------------|
| saldo ES-PT | -16.939.503     | 21.000.350      | -1.897.324 | 6.550.727  |
| saldo ES-FR | -17.145.379     | 21.316.141      | -4.068.910 | 12.587.421 |
| saldo ES-MR | -6.704.050      | 4.745.200       | -2.310.422 | 0          |

**Figure 5. Exchanged capacity and market matched energy in ES-PT and ES-FR bidding zone borders in day ahead trading 2016**

Source: CNMC

In 2017, the following auctions for selling FTR-options were performed:

|                               | <b>Price<br/>(€/MWh)</b> | <b>Quantity<br/>(MW)</b> |
|-------------------------------|--------------------------|--------------------------|
| <b>Contracts<br/>(period)</b> | <b>16 march 2017</b>     |                          |
| FTR P-E Q2-17                 | 0,06                     | 200                      |
| FTR E-P Q2-17                 | 0,07                     | 200                      |
| FTR P-E Q3-17                 | 0,05                     | 100                      |
| FTR E-P Q3-17                 | 0,05                     | 100                      |
| <b>Contracts<br/>(period)</b> | <b>20 june 2017</b>      |                          |
| FTR P-E Q3-17                 | 0,03                     | 200                      |
| FTR E-P Q3-17                 | 0,03                     | 200                      |
| FTR P-E Q4-17                 | 0,07                     | 100                      |
| FTR E-P Q4-17                 | 0,06                     | 100                      |
| <b>Contracts<br/>(period)</b> | <b>14 september 2017</b> |                          |
| FTR P-E Q4-17                 | 0,08                     | 200                      |
| FTR E-P Q4-17                 | 0,03                     | 200                      |
| <b>Contracts<br/>(period)</b> | <b>13 december 2017</b>  |                          |
| FTR P-E Q1-18                 | 0,10                     | 500                      |
| FTR E-P Q1-18                 | 0,05                     | 500                      |
| FTR P-E Q2-18                 | 0,10                     | 200                      |
| FTR E-P Q2-18                 | 0,06                     | 200                      |

**Table 4. Results of the auctions FTR-options PT-ES**

Source: OMIP

#### Cross-border balancing exchanges

The exchanges under the BALIT platform were successfully extended to Portugal and Spain as from June 2014. Under this platform, bilateral TSO-TSO exchanges of balancing energy between neighboring systems (i.e. Portugal – Spain or Spain – France) are carried out. The volumes exchanged have increased in 2017 considerably compared to the volumes exchanged in the previous year, especially concerning exports of balancing energy from Spanish system to its neighbors.

|                                     | <b>(from/to) Portugal</b> | <b>(from/to) France</b> |
|-------------------------------------|---------------------------|-------------------------|
| Import (MWh)                        | 39,100                    | 38,150                  |
| Export (MWh)                        | 156,000                   | 301,800                 |
| <b>Total exchanged energy (MWh)</b> | <b>195,100</b>            | <b>339,950</b>          |

**Table 5. Balancing energy exchanged with neighbouring systems in 2017 (MWh)**

Source: REE

In the future, a new regional solution is expected to enhance the experience of the current BALIT bilateral solution. The TERRE (Trans European Replacement Reserve Exchange) project is a pilot initiative for cross-border Replacement Reserve (RR) exchanges. It has been set up to support the implementation of the Guideline on “Electricity Balancing” (EB GL) and involves several TSOs from UK to Italy.

In 2016, the TERRE project progressed through its design phase under the legal scope of a Memorandum of Understanding (MoU) and Non-Disclosure Agreement (NDA). The TERRE project design was positively evaluated by the stakeholders and the NRAs in a public consultation launched by March 2016. At present, the TERRE project is in the implementation phase, which includes the development of the common RR platform, the follow-up of the local implementation by the participants, and the preparation for the parallel testing and the Go-live.

As for the future EU wide common platforms for frequency restoration reserves, MARI and PICASSO have been nominated as reference projects for manually and automatic activation respectively. Both projects are still under design phase.

An imbalance-netting project will be implemented on 2019, until the go-live of PICASSO in 2022, which will allow for cross border compensation of imbalances in different directions.

Monitoring technical co-operation between European Union and third-country TSOs

This monitoring has been incorporated as a new duty for CNMC by means of Act 3/2013. In this regard, CNMC monitors exchanges between the Spanish and Moroccan systems in accordance to the existing provisions included in the Spanish legislation. It is worthy to note that Morocco is synchronized to the continental European transmission system through the interconnection with the Spanish system.

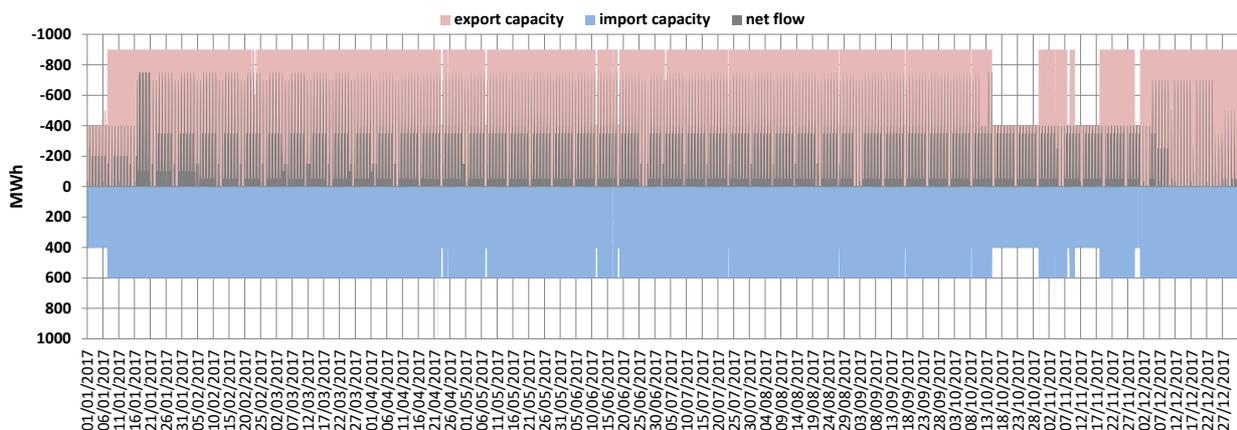


Figure 6. Exchange capacity and market matched energy between Spain and Morocco in 2017

Source: CNMC

### Monitor TSO investment plans in view of TYNDP

This competence has been transposed by Act 3/2013. However, the Spanish NRA already monitored the investment plan of the TSO on a regular basis.

The Act 24/2013, of the Power Sector, establishes the basics of electricity planning incorporating tools to link the level of investment to the situation of the economic cycle, and the principles of economic sustainability. Annual investment limits are established in addition to the possibility of a special review of it from unexpected events affecting the efficiency, security and safety; as well as the necessary coordination of network planning with urban planning.

In addition, the Royal Decree 1047/2013, in its Articles 11 to 14, provides quantification and monitoring of these annual investment plans and their consistency with the National long term Plan.

As regards the connection between the EU and national long term network development plans, an assessment of consistency between the EU-wide TYNDP 2014 and the Spanish national plan was carried out in the framework of ACER. In addition, CNMC participated in the ACER Opinion on the TYNDP 2014 which includes considerations concerning Spain.

The national long term network development plan currently in force was subject to CNMC's report on April 2015 and covers the period 2015-2020, as well as some investments with a longer lead time (2022) in order to encompass the infrastructures included in the TYNDP 2012 and 2014.

Also, in the TYNDP 2016 is included the Regional Investment Plan 2015 Continental South West Europe, in which the required capacity for 2030 is analysed depending on the different scenarios. The main drivers took into account are the integration of MIVEL to European mainland market, the RES integration, especially in the Iberian Peninsula and the need for Spain to comply with the EU 20% interconnection rate target by 2020 beyond the Biscay Gulf project, already included in the TYNDP 2014.

### Cooperation

Act 3/2013 has incorporated this duty as one of CNMC's objectives. CNMC has a firmly established cooperation with the NRAs of France and Portugal on cross-border issues, especially in the context of the MIBEL and the SWE region. Besides, CNMC cooperates with all NRAs of the EU in the context of CEER, the ACER Regulation as well as other relevant Regulations such as REMIT and the Network Codes.

#### **3.1.5 Compliance**

### Compliance of regulatory authorities with binding decisions of the Agency and the Commission







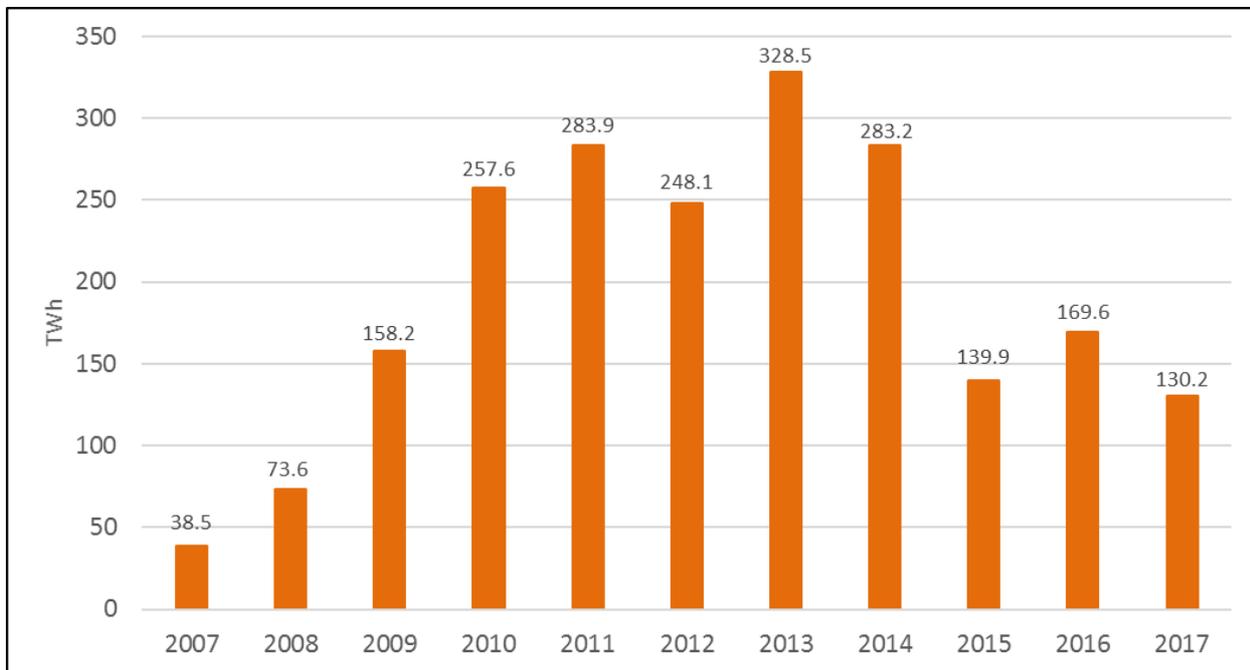
|                           | 2014      |         | 2015      |         | 2016      |         | 2017      |         |
|---------------------------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|
|                           | Downwards | Upwards | Downwards | Upwards | Downwards | Upwards | Downwards | Upwards |
| <b>Endesa</b>             | 29.8%     | 30.3%   | 35.2%     | 31.1%   | 30.4%     | 26.0%   | 32.8%     | 24.3%   |
| <b>Iberdrola</b>          | 37.7%     | 32.3%   | 34.3%     | 28.4%   | 35.3%     | 33.4%   | 29.7%     | 38.8%   |
| <b>Gas Natural Fenosa</b> | 11.5%     | 23.1%   | 8.0%      | 24.5%   | 9.2%      | 24.6%   | 6.1%      | 20.8%   |
| <b>EDP</b>                | 4.1%      | 4.4%    | 4.8%      | 4.8%    | 6.1%      | 4.5%    | 7.9%      | 4.8%    |
| <b>Viesgo</b>             | 13.6%     | 6.4%    | 14.2%     | 7.7%    | 13.4%     | 7.8%    | 17.1%     | 7.9%    |
| <b>Others</b>             | 3.3%      | 3.4%    | 3.5%      | 3.5%    | 5.6%      | 3.7%    | 6.4%      | 3.4%    |

**Table 7. Tertiary reserve plus deviation management market shares (years 2013-2017)**

**Source: CNMC, REE**

- The OTC market

The OTC traded volumes in 2017 (130.2 TWh) decreased 23.3% compared to 2016 (169.6 TWh). Figure 9 shows the evolution of the OTC traded volumes since year 2007. The significant reduction from 2015 with respect the traded volumes in the previous years can be related to several factors like the abandonment of CESUR auctions, the fact that banks & financial institutions have left the market and the impact of MiFID II in terms of requirements to energy trading companies.



**Figure 9. Accumulated OTC volume traded in one year (TWh) (2007 to 2017)**

**Source: CNMC with data from brokers**

- Prices

The Spanish OTC market (“Over The Counter”) is a non-organized bilateral market, in which traders (usually by means of a broker), trade forward contracts with cash settlement. Hence, according to article 2.3 of the Securities Market Law<sup>9</sup>, they have to be considered as financial instruments. In the Spanish market, the supervision of the financial contracts traded in the OTC market is under the scope of the MiFID II<sup>10</sup> and MiFIR<sup>11</sup> and the Securities Market Law, and thus of the Spanish Securities Markets Commission (*Comisión Nacional del Mercado de Valores, CNMV*).

Therefore, it is necessary to focus the supervision of this market with a coordination perspective between CNMV and CNMC. In this sense, the Directive 2009/72/EC indicates in its recital 39 the necessary cooperation between energy market regulators and financial market regulators in order to enable each other to have an overview over the markets concerned.

In the scope of the cooperation between regulatory agencies, Regulation (EU) N° 1227/2011, of 25 October 2011, on Wholesale Energy Market Integrity and Transparency (REMIT) states explicitly as necessary in its Recital 29 that “*national regulatory authorities, competent financial authorities of the Member States and, where appropriate, national competition authorities should cooperate to ensure a coordinated approach to tackling market abuse on wholesale energy markets which encompasses both commodity markets and derivatives markets*”.

The improvement of the supervision of the OTC market is also under the scope of application of REMIT. This Regulation, aiming to improve the market integrity and transparency of the wholesale energy markets, specifies that the wholesale energy markets “*encompass both commodity markets and derivative markets*”, that “*include, inter alia, regulated markets, multilateral trading facilities and over-the-counter (OTC) transactions and bilateral contracts, direct or through brokers*”, and that the “*price formation in both sectors is interlinked*”.

Although CNMC has limited information over OTC power transactions (volumes and transaction prices, through the information voluntarily submitted by the main brokers), by means of the Collaboration Agreement between the Spanish NRA and the Spanish Securities Market Commission (CNMV), signed on 3 July 2012, CNMC can ask CNMV data about OTC transactions regarding the supervision of wholesale energy markets in the context of investigations into potential market abuses<sup>12</sup>.

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<sup>9</sup> Act 24/1988.

<sup>10</sup> MiFID II: Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Directive 2002/92/EC and Directive 2011/61/EU.

<sup>11</sup> MiFIR: Regulation (EU) No 600/2014 of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Regulation (EU) No 648/2012.

<sup>12</sup> This was made possible by the Sustainable Economy Act, whose 5<sup>th</sup> final disposition modified the Securities Market Law, enabling the information exchange between CNMV and the entities composing the MIBEL Regulatory Council.

CNMC has access to all data traded/registered in OMIP-OMIClear, by means of the existing cooperation procedures between the members of the MIBEL Regulatory Council.

Under REMIT, CNMC will have access to relevant information held by ACER which it has collected in accordance with paragraph 1 (transactions, including orders to trade) of Article 8. In this sense, according to article 12.2 of Commission Implementing Regulation (EU) N° 1348/2014, on 7 October 2015 started data reporting of contracts executed at organised market places<sup>13</sup>, including matched and unmatched orders. Details of contracts concluded outside an organised market places started on 7 April 2016.

- Transparency

CNMC publishes monthly supervisory reports of the electricity forward markets in Spain with aggregated data from all the existing forward market mechanisms and trading venues (i.e. OTC market, the futures markets managed by OMIP and by EEX, and the cleared volumes in the clearing houses (OMIClear, BME Clearing and EEX-European Commodity Clearing (ECC)<sup>14</sup>).

- Effectiveness of competition

So far there has been limited information available regarding the volume of transactions conducted in OTC markets, as well as for the physical bilateral contracts (particularly contracts between companies of the same group).

According to Commission Implementing Regulation (EU) N° 1348/2014, the NRAs will have access to transactions, including orders to trade, to be submitted by the market participants (as previously commented, data reporting of traded data on organised market places, and capacity and use of electricity and natural gas facilities, started on 7 October 2015), as well as financial data, the latter by means of the MoU ACER-ESMA<sup>15</sup>. This will allow CNMC to perform an integrated supervision.

<sup>13</sup> According to article 2.4 of Commission Implementing Regulation (EU) N° 1348/2014, “organised market place” or “organised market” include electricity and gas exchanges, brokers and other persons professionally arranging transactions, and trading venues as defined in Article 4 of Directive 2014/65/EU of the European Parliament and of the Council (MiFID II).

<sup>14</sup> Since the beginning of 2014, the base load futures whose underlying price is the Spanish spot price (“FTB” contracts), with financial settlement, can be registered, cleared and settled in EEX-European Commodity Clearing (ECC). Likewise, the base load futures whose underlying price is the German/Austrian spot price and the base load futures whose underlying price is the French spot price, with financial settlement, can be registered, cleared and settled in OMIP-OMIClear. Also since 16 February 2015, Spanish power futures and options can be traded in the European Energy Exchange (EEX), and since 13 July 2016 German and French futures can be traded in OMIP.

<sup>15</sup> MoU ACER-ESMA concerning the consultation and cooperation regarding their regulatory responsibilities in relation to EU wholesale energy markets, signed on 18 July 2013.

### The power futures markets (OMIP and EEX) and OTC volumes registered, cleared and settled by Clearing Houses

In the context of the MIBEL Regulatory Council, Spanish NRA supervised the futures market managed by OMIP<sup>16</sup>, in co-ordination with the other members of the MIBEL Regulatory Council. Such a market started on 3<sup>rd</sup> July 2006. The rules of this market are registered on the Portuguese Securities Market Commission (Comissão do Mercado de Valores Mobiliários, CMVM).

The energy traded in the continuous market of the MIBEL futures market managed by OMIP during year 2017 amounted to 7.7 TWh<sup>17</sup>, lower than in the previous year (19.5 TWh in 2016). The OTC volumes cleared and settled by OMIP clearing house (OMIClear) decreased also in 2017 (15.5 TWh) compared to 2016 (36.4 TWh).

The energy traded in the continuous market of the European Energy Exchange (EEX) during year 2017 amounted to 6 TWh, lower than in the previous year (7.3 TWh in 2016). The OTC volumes cleared and settled by EEX-European Commodity Clearing (ECC) amounted to 60.9 TWh in 2017, slightly lower than in the previous year (64.3 TWh in 2016).

BME Clearing is active in Spain since 21 March 2011 for OTC clearing of Iberian power derivatives. The accumulated cleared volume during year 2017 in BME Clearing reckons 18 TWh, lower than in the previous year (24.1 TWh in 2016).

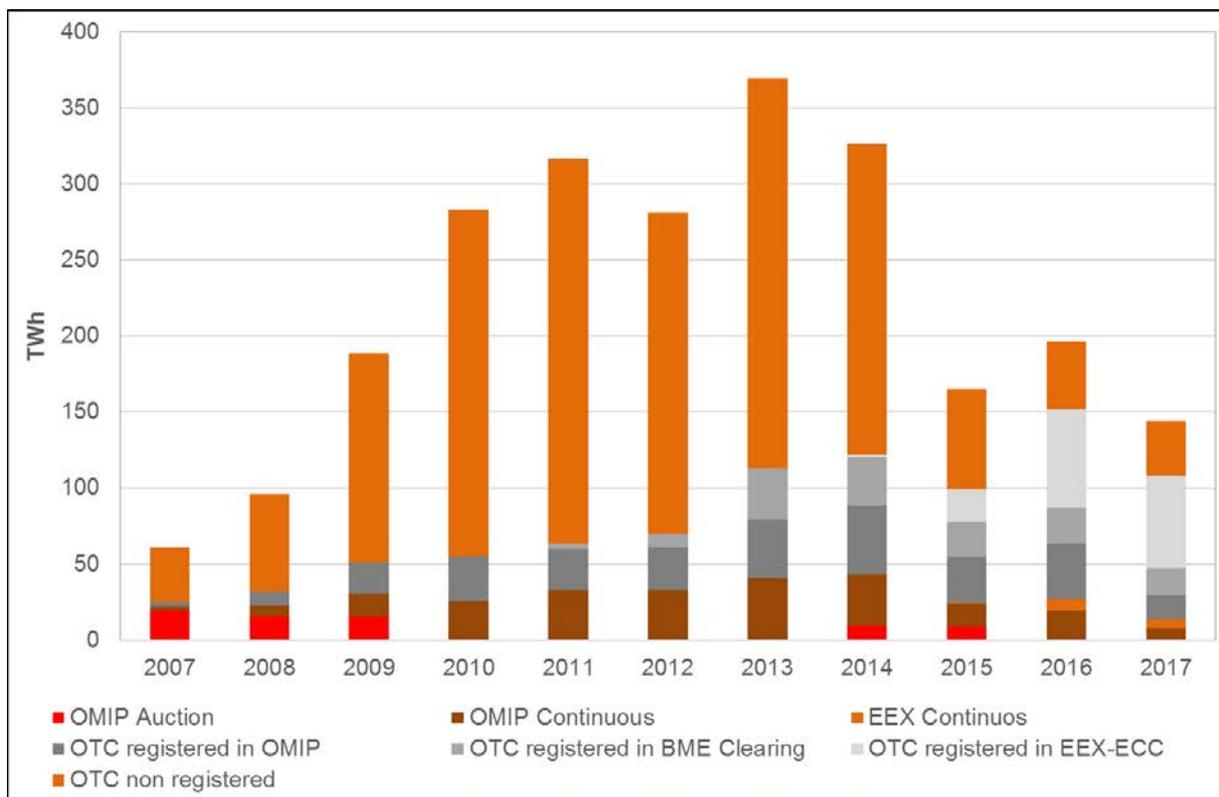
Figure 10 shows the trading evolution (in terms of energy traded) in the MIBEL futures market (OMIP auctions and OMIP continuous market), in the EEX market, the volumes traded in the OTC market, and the part of such volumes registered in OMIClear<sup>18</sup>, BME Clearing and EEX-European Commodity Clearing (ECC).

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<sup>16</sup> *Operador do Mercado Ibérico de Energia SGMR, S.A.* (Iberian Energy Market Operator, Portuguese side).

<sup>17</sup> Additionally, 5.7 TWh traded through OMIP auction mode for selling renewable energy in Portugal and 6.6 TWh for selling Financial Transmission Rights (FTR-options).

<sup>18</sup> Sociedade de Compensação de Mercados de Energia.

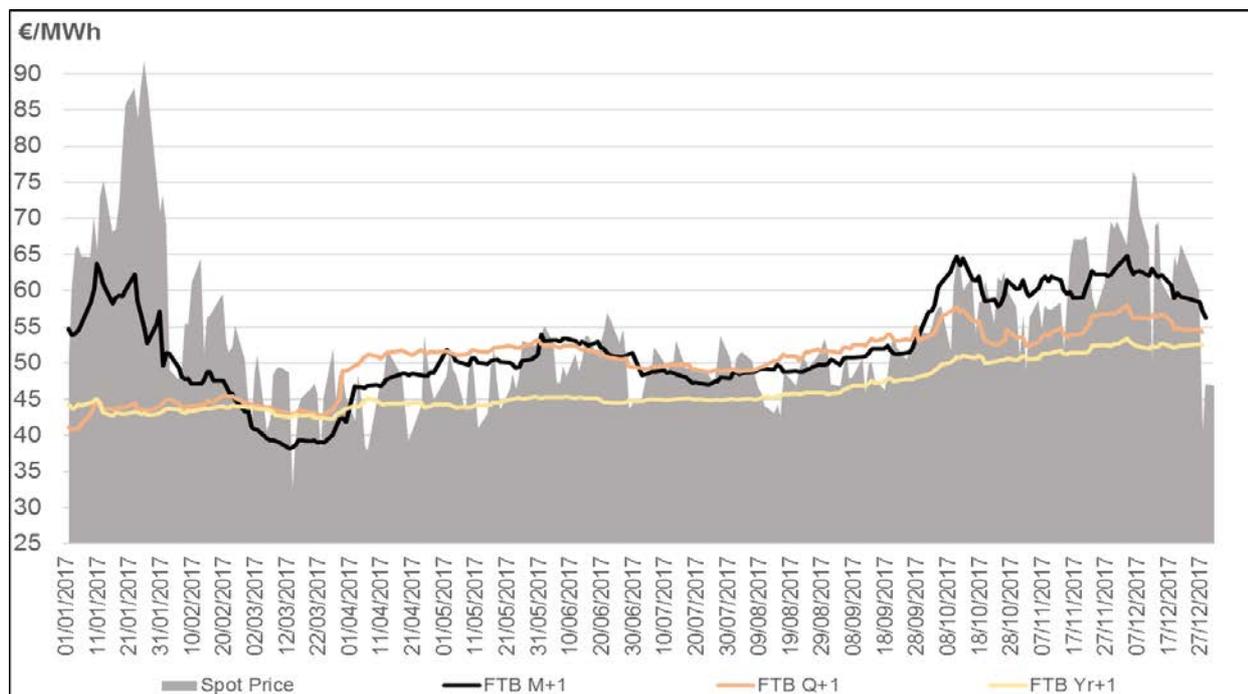


**Figure 10. Evolution of accumulated traded volumes per year in OMIP auctions and continuous market and EEX market, and OTC volumes registered in OMIClear, BME Clearing and EEX-European Commodity Clearing (ECC) (TWh)**

**Source: Brokers, OMIP-OMIClear, Bolsas y Mercados Españoles (BME) and EEX-ECC**

- Prices

Figure 11 shows the daily evolution of the Spanish electricity spot (day ahead) and futures prices during 2017. For the spot price, the daily average published by OMIE is considered. For the futures prices, settlement prices published by OMIP are used. The prompt month, quarter and year contracts (“M+1”, “Q+1” and “Yr+1” respectively) for the base load futures whose underlying price is the Spanish spot price (“FTB” contracts) are shown. The volatility of the spot prices is much larger than the volatility of the futures prices, due to the strong renewable penetration. The annual average price for the spot price in 2017 (52.24 €/MWh) is higher than the average settlement prices for the futures contracts whose underlying price is the Spanish spot price in 2017 in their whole trading horizon (52.19 €/MWh for the prompt month contract, 50.26 €/MWh for the prompt quarter contract and 46.25 €/MWh for the prompt year contract). The futures contracts showing larger volatility in the next figure are the monthly contracts, fluctuating between 38.20 €/MWh and 64.90 €/MWh.



**Figure 112. Evolution of daily spot prices and prompt month, quarter and year (“M+1”, “Q+1” and “Yr+1” respectively) futures prices (€/MWh) during year 2017**

**Source: OMIE and OMIP-OMIClear**

- Transparency

The following sources provide information regarding post-trade transparency. They are available by the existing clearing houses and the power futures market operator:

- Historical aggregated data per contract regarding settlement prices, best bid and offer, traded and cleared volumes, and open interest by OMIP-OMIClear, as well as daily market bulletins with the key statistics of the trading sessions and information of any special event (e.g. market maker agreements, new trading member, renewable regime auctions in Portugal, FTR auction related to the Portugal-Spain electricity interconnection, etc.).
- Historical aggregated data per contract regarding settlement prices, cleared volumes and open interest by BME Clearing.
- Historical aggregated data per contract regarding settlement prices, traded and cleared volumes and open interest by EEX-ECC.

- Effectiveness of competition

The amount of registered members in OMIP, in BME Clearing and EEX-ECC grows steadily, in the third case at a faster pace.

At the end of 2017, there were 69 trading members registered in OMIP (72 trading members in 2016) and 146 (126 trading members in 2016) in BME Clearing. EEX attracts trading participants

from all over Europe to trade on its platform. In total, 257 participants are admitted to trading at EEX (246 in 2016).

Regarding OMIP Trading highlights in year 2017, OMIP reached a total screen trading (i.e. auction and continuous) volume of 7.7 TWh decreasing more than 60% compared to 2016 (19.5 TWh).

Regarding OMIClear highlights in year 2017: (i) OMIClear reached a total cleared volume of 15.5 TWh, 58% less than in 2016 (36.4 TWh) and (ii) OMIClear clearing volumes represent 16% of total cleared volumes.

Regarding Market Making highlights in OMIP, the same companies continue as Market Makers: Endesa, EDF Trading and Axpo Iberia. Apart from Endesa, the other two entities have been assuming the Market Maker role for several years, which shows their trust in this market.

Regarding BME Clearing highlights in year 2017: (i) increase in number of participants (from 126 to 146 participants); (ii) registered 18 TWh, 25% less than in 2016 (24.1 TWh) in 2,011 trades compared to 2,632 trades in 2016; and (iii) 20 new participants joined BME Clearing and 98 participants registered trades during 2017.

Regarding EEX-ECC highlights in year 2017: (i) the energy traded in the continuous market of the European Energy Exchange (EEX) during year 2017 amounted to 6 TWh, 18% smaller than in the previous year (7.3 TWh in 2016); and (ii) the OTC volumes cleared and settled by EEX-European Commodity Clearing (ECC) amounted to 60.9 TWh in 2017, slightly lower than in the previous year (64.3 TWh in 2016). As in 2017, EEX-ECC became the number one cleared trading venue for Spanish power.

#### Monitoring the occurrence of restrictive contractual practices

The Royal Decree-Law 13/2012 reinforced this duty. As a consequence, CNMC is entitled to analyse specific cases following a complaint of the affected party. Furthermore, CNMC can address this issue on its own initiative as competition authority.

#### Respecting contractual freedom with regard to interruptible supply contracts and with regard to long-term contracts

Act 3/2013 has incorporated this duty as one of CNMC's functions. CNMC intervenes after the receipt of a complaint as regards breaches of contractual freedom. This activity is performed under the framework of market monitoring activities.

In case some demand has to be curtailed, there is a regulated service provided on a voluntary basis by some consumers called "interruptible demand". The revenue regime for this service was revised in 2013 by Order IET/2013/2013, of 31<sup>st</sup> October. This revision took place considering the low demand and high penetration of renewable generation.

In the new regime, the service providers' selection and the revenue level are fixed through an auctioning mechanism. The auction for the interruptibility service for the delivery period of 2017



This model provides a dynamic price signal to small customers and consequently, a way to implicitly participate in the market by shifting consumption to the hours of the day where energy is cheaper.

In 2017, the number of customers supplied under the PVPC regime by reference suppliers is decreasing more slowly than in previous years (below the threshold of 10 kW) and at the end of 2017 it was 11.565.045 (40% of the consumers entitled).

### **3.2.2.1 Monitoring the level of prices, the level of transparency, the level and effectiveness of market opening and competition**

As mentioned in 3.2.1.1, the duties contained in article 37(1) (i) and (j) of Electricity Directive have been incorporated as functions of CNMC by Act 3/2013.

- Prices

At retail level, CNMC monitors retail prices through the commercial offers that are published in CNMC's price comparison tool and through the "Circular" CNE 2/2005. By this Circular, suppliers are officially requested to submit a declaration of the average invoice charged to each type of customer (according to the access tariff group). The results of this monitoring are published in CNMC's retail electricity market report which is published regularly<sup>19</sup>.

CNMC has developed a number of tools for empowering consumers, available on the web: a price comparison tool (PCT) to compare electricity and gas offers, and a tool for checking the electricity bill for those consumers under the regulated tariff.

CNMC price comparison tool aims to improve the transparency of retail markets. In this web based price comparison tool, suppliers' public commercial offers for low voltage consumers are disclosed. CNMC monitors the conditions of the offers included in the comparison tool and the results are published in an annual report.

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<sup>19</sup> See "Informe de supervisión del mercado minorista de electricidad año 2016" published the 23<sup>rd</sup> November, 2015.

| Comercializadora  | Oferta                              | Importe Anual 1º año | Importe Anual 2º año | Validez                          | Servicios adicionales incluidos | Verde | Consultar detalle |
|---|-------------------------------------|----------------------|----------------------|----------------------------------|---------------------------------|-------|-------------------|
|    | Tarifa de luz 100%<br>Online   2.0A | 604,81€              | 613,63€              | Válida para cualquier consumidor | Ninguno                         | No    | <a href="#">→</a> |
|  | Tarifa ATR 2.0A                     | 605,71€              | 605,71€              | Válida para cualquier consumidor | Ninguno                         | No    | <a href="#">→</a> |
|  | Fijoluz Península<br>2.0A           | 614,90€              | 614,90€              | Válida para cualquier consumidor | Ninguno                         | No    | <a href="#">→</a> |

*Figure 13. - Sample of commercial offers for a domestic consumer*

**Source: CNMC website**

The tool for checking the electricity bill gives consumers who have opted for PVPC and have smart meter, the ability to check their bill, besides the financial impact of their electricity consumption depending on the access costs plan chosen between the general tariff, the night tariff and the super-valley tariff (electric vehicle) and depending on the load contracted.



During 2016, 0.9 million consumers moved from the last resort supply (PVPC taking into account data collected from the five major Spanish distribution companies) in favour of free market. In 2016, the switching rate maintained high rates, 11.0% where 3.2% of which belongs to switching from the last resort supplier to free market.

During 2017, 0.9 million consumers moved from the last resort supply in favour of free market. In 2017, the switching rate slightly decreased with respect to 2016 to a value 10.8%. Switching from the last resort supply to free market represents 3.1% movements within the liberalised market 6.8% and movements from the last resort supply 0.8%.

As shown in the table below, the evolution of the switching rate during 2010-2017 has followed an increasing trend, topping 13.0% in 2013, and as seen before decreasing slightly in 2014 through 2017. The number of failed switches rises in 2014, after a five year decreasing trend.

| ELECTRICITY SWITCHING DATA 2010 – 2017 |            |            |            |            |            |            |            |            |
|--|------------|------------|------------|------------|------------|------------|------------|------------|
|  | 2010       | 2011       | 2012       | 2013       | 2014       | 2015       | 2016       | 2017       |
| Domestic switching rate                | 6.6%       | 10.0%      | 11.6%      | 12.6%      | 11.8%      | 10.7%      | 10.6%      | 10.3%      |
| Nº domestic customers                  | 26,555,315 | 26,645,921 | 26,740,386 | 26,844,788 | 27,976,345 | 28,090,488 | 28,111,343 | 28,230,407 |
| Total switching rate                   | 7.4%       | 10.6%      | 12.1%      | 13.0%      | 12.1%      | 11.2%      | 11.1%      | 10.8%      |
| No. all customers                      | 27,406,461 | 27,505,927 | 27,593,863 | 27,684,136 | 28,824,588 | 28,868,297 | 28,959,663 | 29,085,625 |
| % failed switches                      | 8.20%      | 5.98%      | 5.48%      | 5.23%      | 6.1%       | 8.2%       | 10.4%      | 11.2%      |

**Table 8. Electricity Switching 2010-2017**

**Source: CNMC, OCSUM**

- Effectiveness of competition

Act 3/2013 granted CNMC the power to supervise the degree of competition in the energy markets at wholesale and retail level.

During 2017, the degree of concentration decreased, maintaining the declining tendency.

At the end of 2017, and based on the information provided by the five biggest Spanish distribution companies, the markets shares of the largest companies were as follows:

- Market share of the three largest companies in the whole retail market by volume: 68%
- Market share of the three largest companies in the non-household sector by volume: 63%
- Market share of the three largest companies in the market for households by metering points (all distributors): 88%



According with article 7 point 32 of Act 3/2013, CNMC should “*Inspect the fulfillment of the requirements of the natural gas and electric energy suppliers...*” Several procedures regarding the breaching of consumer protection provisions were solved during 2016 and first half 2017, imposing penalties by a total amount of 1.540.000€.

Also during this period a procedure for anti-competitive practices has been initiated against the last resort suppliers of two incumbents in the energy market.

| Reference     | Supplier              | Solved date | Penalty (€) |
|---------------|-----------------------|-------------|-------------|
| SNC/DE/041/16 | ENDESA ENERGÍA        | 23/02/2017  | 40,000      |
| SNC/DE/043/16 | IBERDROLA CLIENTES    | 02/02/2017  | 30,000      |
| SNC/DE/031/16 | ENDESA ENERGÍA        | 13/01/2017  | 20,000      |
| SNC/DE/026/16 | VIESGO ENERGÍA        | 12/01/2017  | 15,000      |
| SNC/DE/027/16 | ENDESA ENERGÍA        | 12/01/2017  | 20,000      |
| SNC/DE/025/16 | ENDESA ENERGÍA        | 12/01/2017  | 20,000      |
| SNC/DE/024/16 | GAS NATURAL SERVICIOS | 12/01/2017  | 10,000      |

**Table 9. Procedures regarding the breaching of consumer protection provisions solved during 2017**

#### Report on tariff deficit

From 2000 to 2013, the revenues in the Spanish Electricity System have not been sufficient to cover system’s costs. Accordingly, a subsequent deficit has arisen (the “Tariff Deficit”).

The origin of the electricity tariff deficit, the evolution of access cost and tariffs and the financial mechanisms are detailed in the National Report 2012. In 2013 the Government carried out an integral reform of the Electricity System in Spain, with the aim of correcting the electricity tariff deficit and guaranteeing electricity supply at the lowest possible price for the consumer.

As a result of the reform, the sector’s costs and revenues are back in balance and the year 2015 ended with a surplus of 469.3 million (+421.5 million euros in 2016).

The electricity system’s total debt up to the 31st December 2017 is EUR 21.0 billion euros. This includes 2013 tariff deficit securitization that was performed in December 2014. 80.7% of the total debt (EUR 16.9 billion) has been securitized through FADE, having the bonds issued by FADE



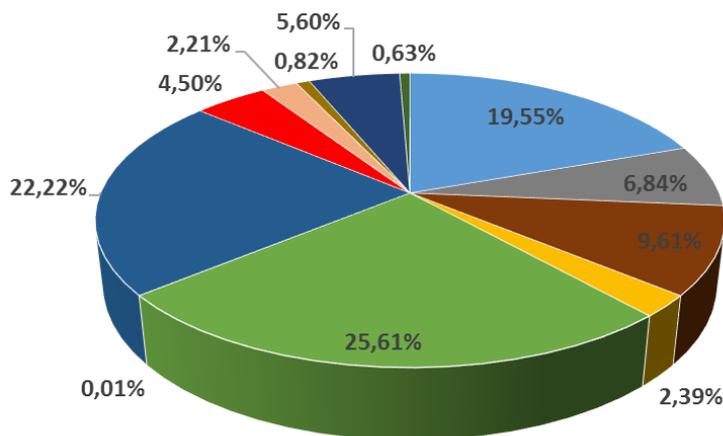
The yearly maximum for hourly average demand was reached on 18<sup>th</sup> January with 41,015 MWh. This value, despite being 2.2% higher than 2016, was 8.6% lower than the historical maximum registered in 2007.

Installed capacity in generating facilities on the peninsular system showed a slight decrease of 0.6% during 2017 compared to the previous year, reaching a total of 98.88 GW. This reduction in installed capacity is mainly due to the closure of the Garoña nuclear plant, which has meant a decrease of 455 MW. Variations in other technologies have been null or not very significant, except cogeneration that registered a slight decrease of 2.8%.

Current generation fuel mix and expected developments

The following chart and table show the shares by technology of installed generation capacity in the Spanish national system (mainland and extra-peninsular) in 2017.

- Hydraulic
- Nuclear
- Coal
- Fuel + Gas
- Combined Cycle (CCGT)
- Hydro-wind
- Wind power
- Solar Photovoltaic
- Solar Thermoelectric
- Other Renewables
- Cogeneracion and other
- Waste



**Figure 16. Installed generation capacity in the Spanish national system at the end of 2017**

Source: REE



In 2017, total demand of power generation (including mainland and no-peninsular demand) increased around 1.1% reaching 268,140 GWh, which was covered as follows:

| Balance of Spanish electric energy system (GWh) | 2016           | 2017           | Δ % 2017/2016 |
|---|----------------|----------------|---------------|
| Hydraulic                                       | 39,171         | 20,613         | -47,4%        |
| Nuclear   | 56,099         | 55,609         | -0,9%         |
| Coal  | 37,491         | 45,196         | 20,6%         |
| Fuel+gas (conventional) <sup>(1)</sup>          | 6,765          | 7,011          | 3,6%          |
| Combined Cycle (CCGT) <sup>(2)</sup>            | 29,260         | 37,296         | 27,5%         |
| Hydro-wind                                      | 18             | 20             | 12,7%         |
| Wind power                                      | 47,695         | 47,897         | 0,4%          |
| Solar Photovoltaic                              | 7,965          | 8,385          | 5,1%          |
| Solar Thermoelectric                            | 5,060          | 5,348          | 5,5%          |
| Other Renewables <sup>(3)</sup>                 | 3,426          | 3,614          | 5,5%          |
| Cogeneracion                                    | 25,817         | 28,170         | 8,7%          |
| Waste   | 3,392          | 3,485          | 2,7%          |
| <b>Net production</b>                           | <b>262,161</b> | <b>262,645</b> | <b>0,1%</b>   |
| Pumped storage consumption                      | -4,819         | -3,675         | -23,7%        |
| International Exchanges <sup>(4)</sup>          | 7,667          | 9,171          | 19,6%         |
| <b>Total demand</b>                             | <b>265,009</b> | <b>268,140</b> | <b>1,1%</b>   |

**(1) Generation from auxiliary generation units is included in the Balearic Islands' electricity system.**

**(2) Includes operation in open cycle mode.**

**(3) Biogas, biomass, wave energy, geothermal.**

**(4) Positive value: importer balance; negative value: exporter balance. Values of increments not calculated when the exchange balances have different sign.**

**Note: Consumption in generation corresponding to hydro, nuclear, coal, fuel/gas and combined cycle production has been netted in each of the corresponding amounts incorporated in the table above.**

**Table 11. Balance of the Spanish electricity system**

**Source: REE**

### 3.3.2 Monitoring investment in generation capacities in relation to SoS

#### Duties and powers of the regulatory authority

The Spanish regulator follows-up the coverage of demand in the electricity and gas sectors, including the investment on new generation capacities (as well as decommissioning).

In this context, the installed power capacity on the peninsular system decreased compared to the previous year and closed 2016 at 98,877 MW (0.6%) less than in December 2016, following the





| Balance of Spanish electric peninsular system (GWh) | 2020           |
|---|----------------|
| Hydraulic (large)                                   | 30,220         |
| Nuclear   | 59,670         |
| Coal  | 44,690         |
| Fuel+gas  | —              |
| Combined Cycle (CCGT)                               | 49,790         |
| Hydraulic (small)                                   | 6,620          |
| Wind power  | 61,310         |
| Solar Photovoltaic                                  | 9,840          |
| Solar Thermoelectric                                | 6,560          |
| Renewable Thermal                                   | 7,310          |
| Cogeneration and other                              | 35,350         |
| <b>Total production</b>                             | <b>311,360</b> |
| Consumption in generation                           | -7,920         |
| Pumped storage consumption                          | -6,020         |
| International Exchanges <sup>(1)</sup>              | -12,500        |
| <b>Total demand</b>                                 | <b>284,920</b> |

<sup>(1)</sup> Including Peninsula-Balearic Islands' link

**Table 13. Balance of Spanish electric peninsular system (GWh) for 2020**

**Source: Ministry for the Ecological Transition and REE**

| Peak demand (MW) | Winter         |               | Summer         |               |
|------------------|----------------|---------------|----------------|---------------|
|                  | Lower Scenario | High Scenario | Lower Scenario | High Scenario |
| 2019             | 46,300         | 47,900        | 42,600         | 44,000        |
| 2020             | 47,300         | 49,000        | 43,600         | 45,100        |

**Table 14. Expected Peak Demand (MW) for the Spanish Mainland in the period 2019-2020, according to National Network Development Plan 2015-2020**

**Source: Ministry for the Ecological Transition, REE and CNMC**

As regards the envisaged capacity to be installed, main additions are expected among RES-based technologies, mainly wind and solar PV, with another near 4.8 GW and 1.4 GW respectively, by 2020. On the other hand, the generation groups in the “20.000 hours of functioning plan”<sup>20</sup> have carried out the actual disconnection of the electrical system in 2015, as had been committed. Besides, in 2016 it was necessary for large combustions units (coal) to

<sup>20</sup> According to art 4.4 a) of the Large Combustion Plant Directive, the existing plants may be exempted from their inclusion in the national emission reduction plan if the operator of the plant undertakes, in a written declaration to the competent authority, not to operate the plant for more than 20 000 operational hours starting from 1 January 2008 and ending no later than 31 December 2015.

make the necessary investments to comply with Directive 2010/75/UE of the European Parliament and of the Council on industrial emissions. Consequences are unpredictable but some of them could be decommissioned.

In the following table the expected installed generation capacity for Spanish Mainland in the period 2019-2020, according to National Network Development Plan 2015-2020, is shown:

| Generation capacity (MW)        | 2019           | 2020           |
|---------------------------------|----------------|----------------|
| Hydraulic (large)               | 15,288         | 15,288         |
| Pumped hydro                    | 3,770          | 3,770          |
| Nuclear                         | 7,865          | 7,865          |
| Fuel+gas (conventional)         | —              | —              |
| Coal                            | 10,270         | 10,270         |
| Combined Cycle (CCGT)           | 19,272         | 19,272         |
| Hydraulic (small)               | 2,267          | 2,300          |
| Wind power                      | 26,850         | 27,650         |
| Solar Photovoltaic              | 5,790          | 5,790          |
| Solar Thermoelectric            | 2,300          | 2,300          |
| Renewable thermal               | 1,201          | 1,254          |
| Cogeneration and other          | 7,340          | 7,390          |
| <b>TOTAL INSTALLED CAPACITY</b> | <b>102,213</b> | <b>103,149</b> |
| Winter available capacity       | 51,710         | 51,860         |
| Summer available capacity       | 52,420         | 52,540         |

**Table 15. Expected installed and firm available capacity installed in winter and summer (period 2019-2020), according to National Network Development Plan 2015-2020**

**Source: Ministry for the Ecological Transition and REE**

Note that expected available capacity does not match expected installed capacity since, for security reasons, some restrictive assumptions about the availability of installed capacity are taken into account in order to calculate reserve margin rate.

For the assessment of the reliability of demand coverage, the Demand Coverage Index has been used traditionally as a parameter. It is calculated as the ratio of the net power available from the generator equipment and the average hourly peak demand provided, in winter and summer respectively (not considered international exchanges in the peak demand). A minimum of 1,1 is accepted as a figure that adequately guarantees coverage of the system demand in extreme situations, given the need to have operating reserves, possible restrictions on the transmission network, errors in forecasting or additional risks. Therefore, under the assumptions made in the analysis by the TSO, it does not provide any additional power to meet peak demand in the high demand scenario considered, as shown in the following tables.

| Reserve margin rate<br>Winter     | 2019                  |                      | 2020                  |                      |
|-----------------------------------|-----------------------|----------------------|-----------------------|----------------------|
|                                   | Lower demand scenario | High demand scenario | Lower demand scenario | High demand scenario |
| Winter available capacity         | 51,710                | 51,710               | 51,860                | 51,860               |
| Peak demand (MW)                  | 46,300                | 47,900               | 47,300                | 49,000               |
| <b>Demand Coverage Index (IC)</b> | <b>1.12</b>           | <b>1.08</b>          | <b>1.10</b>           | <b>1.06</b>          |

| Reserve margin rate<br>Summer     | 2019                  |                      | 2020                  |                      |
|-----------------------------------|-----------------------|----------------------|-----------------------|----------------------|
|                                   | Lower demand scenario | High demand scenario | Lower demand scenario | High demand scenario |
| Summer available capacity         | 52,420                | 52,420               | 52,540                | 52,540               |
| Peak demand (MW)                  | 42,600                | 44,000               | 43,600                | 45,100               |
| <b>Demand Coverage Index (IC)</b> | <b>1.23</b>           | <b>1.19</b>          | <b>1.21</b>           | <b>1.16</b>          |

**Table 16. Expected reserve margin rate in winter and summer. Period 2019-2020, according to National Network Development Plan 2015-2020**

**Source: Ministry for the Ecological Transition, REE and CNMC**

The above Demand Coverage Indices are calculated without taking into account the effect of the interruptible demand, since this service would be guaranteed only the following two years; if it were considered, this Index would increase.

### 3.3.3 Measures to cover peak demand or shortfalls of suppliers

#### Monitoring of security of supply

In case some demand has to be curtailed, there is a service provided by some consumers called "interruptible demand". In 2017, demand coverage in Spain did not experience any relevant problem; however, some interruptible demand was curtailed because of local problems in transmission grid.

The revenue regime for this service was revised in 2013 by Order IET/2013/2013, of 31<sup>st</sup> October. This regime was reviewed in the context of other measures included in the electricity sector reform, which addressed the various activities and cost items of the electricity system, with the aim to ensure the correspondence between revenues and costs.

In the new regime, the service providers' selection and the revenue level are fixed through an auctioning mechanism. The auction for 2017, took place in November 2016. 2,975 MW of interruptible demand were assigned, with a total cost of 525 million €. In 2018, some changes were introduced in the regulatory framework of interruptibility service with a double objective. On the one hand, increase competition in the allocation auctions and reduce the cost of its procurement. On the other hand, facilitate the use of interruptibility based on economic approach that is not only applying it in emergency situations, but also when its application allows to reduce



### TSO certification process

Regarding the main TSO, ENAGAS, requested the certification as a Transmission System Operator on 4<sup>th</sup> November 2011. The Board of the Spanish NRA, by 19<sup>th</sup> April 2012, issued a preliminary certification decision of ENAGAS according to article 63 bis of Hydrocarbons Act (Act 34/1998, of October 7<sup>th</sup>), amended by Royal Decree-Law 13/2012. Pursuant to the mentioned article 63 bis, the NRA notified the preliminary decision on the certification of ENAGAS as TSO, to the European Commission. On June 15<sup>th</sup> 2012, the EC sent its opinion on this preliminary decision. The NRA drafted its final decision on the 26<sup>th</sup> July 2012 and issued the definitive certification for ENAGAS subject to the fulfilment of certain conditions. The definitive certification was also notified to the EC.

In its meeting dated 18<sup>th</sup> April 2013, the Board of the NRA monitored the compliance of the conditions set in the definitive certification decision, resolving that ENAGAS had adopted the measures needed to fulfil the unbundling requirements. This decision adopted by 18<sup>th</sup> April 2013 was also notified to the EC.

In order to guarantee ENAGAS's independence, the Spanish law limits the share capital and the voting rights in ENAGAS. Thus a single person or society cannot, directly or indirectly, own more than 5% share capital or use more than 3% of voting rights. This limit does not apply to State ownership.

Reganosa requested the certification under the Ownership unbundling model on 31st July 2012. In its preliminary decision, the Spanish NRA, in its meeting held on 13th December 2012, rejected the certification identifying certain measures to be adopted by Reganosa to comply with ownership unbundling requirements. On February 2013, the European Commission sent its favourable opinion on this preliminary decision. Eventually, the Board of the NRA in its meeting dated 4th April 2013, issued its final decision rejecting the certification under the ownership unbundling model. Once adopted the proposed measures to comply with unbundling requirements, Reganosa requested again the certification under the Ownership unbundling model on 27th June 2013. After having issued the CNMC preliminary decision and the EC favourable opinion, the Board of CNMC issued its final decision on 4th February 2014. The definitive certification was notified to the EC. Finally, on February 2015, Reganosa was authorized and appointed as natural gas transmission system operator by Ministerial Order IET/241/2015.

On September 7, 2017, Reganosa informed CNMC of the acquisition of 15% of its shareholding by Sojitz Corporation. In its preliminary decision of December 14, 2017 CNMC maintained the certification of Reganosa as transmission system operator, establishing that Sojitz may not appoint members of the supervisory board of Reganosa. In its opinion of February 14, 2018, the European Commission showed its agreement to this prohibition. The final decision of certification has been adopted by the CNMC on April 5, 2018.

Enagás Transporte, S.A.U submitted an application to be certified as Independent System Operator (ISO) of the primary gas transmission networks owned by Saggas and by Enagás Transporte del Norte, S.L. (ETN) on 21st May 2013. The Board of the Spanish NRA in its meetings

dated 18th July and 31<sup>st</sup> July 2013 respectively, issued the preliminary certification decisions of ENAGAS Transporte S.A.U and proceeded to notify them to the European Commission. After EC favourable opinions, the Board of CNMC issued its final decision on 14<sup>th</sup> and 26<sup>th</sup> November 2013, respectively, for Enagás Transporte S.A.U as ISO of the primary gas transmission networks owned by Saggas and by ETN respectively. The definitive certifications were notified to the EC. Finally, on January 2015, Ministerial Orders IET/20/2015 and IET/21/2015 approved appointment of Enagás Transporte, S.A.U. as ISO of the primary gas transmission networks owned by ETN and Saggas respectively.

### DSO Unbundling

Article 63 of the Hydrocarbons Act states the current legal unbundling regulatory framework for DSOs, in line with the Gas Directive 2009/73. Most of the DSO unbundling requirements were introduced in the Spanish legislation in 2007, by the act 12/2007.

DSOs are allowed to belong to a group that undertakes supply activities, provided that a legal unbundled company performs the regulated activities. In addition, functional unbundling for DSOs is required. This includes management separation and measures relating effective decision-making rights.

Article 63 of the Hydrocarbons Act sets forth that an annual report, setting out the internal code of conduct and the measures taken by each regulated company in order to implement the unbundling requirements should be sent to the NRA and the Ministry for approval, and shall be published.

Nowadays there are five DSOs Groups in Spain:

- Nedgia Group, owned by Gas Natural Fenosa (69% supply points)
- Nortegas Group (12% supply points)
- Madrileña Red de Gas, with 856.161 supply points (11%)
- Redexis Group, with 545.281 supply points (7%)
- Gas Extremadura with 74.167 supply points (0,9%)

At the beginning of 2018, only the main DSO (Nedgia - Gas Natural Fenosa) remains as a company vertically integrated with the supplying activity.

Nortegas, Madrileña and Redexis were created as result of the disinvestment in DSO grids from EDP, Gas Natural Fenosa and Endesa, respectively. In particular, it should be mentioned the creation of Nortegas in July 2017 after the sale by EDP of its distribution activity.

In order to differentiate DSO and supplying activities, on January 15, 2018, Gas Natural Fenosa launched a new brand name "NEDGIA" for its natural gas distribution subsidiaries,







The tariff model for transmission applied in Spain is the entry-exit model with a single balancing area. In addition regulated tariffs for LNG terminals and underground storage are set.

According to Act 3/2013, the CNMC is responsible for elaborating the methodology to calculate tariffs and fees for transmission and distribution, regasification, storage and several services provided in the regasification terminals, in accordance with transparent, non-discriminatory and cost-reflective criteria.

However, the article 92 of Law 34/1998, 7 October 1998, on the hydrocarbons sector, establishes the Government shall set up the remuneration of the regulated activities and the tariff structure, and the Ministry for the Ecological Transition, prior consent of the Government's Delegate Commission for Economic Matters, shall approve the tariffs. Before the approbation of the tariffs, the CNMC participates only through a non-binding report on the draft.

Moreover, accordance with the articles 31 and 32 of Regulation (EC) 460/2017, the CNMC should have published, no later than thirty days before the tariff period, so before 2 December 2017, the transmission tariffs as well as the information relating their determination.

The Regulation (EC) 460/2017 lays down that some key elements to establish the methodology shall be set or approved in accordance with Article 41(6)(a) of Directive 2009/73/EC, as the determination of allowed or target revenue of the transmission system operator, the definition of the transmission and non-transmission services, the definition of the tariff structure of each of the services specified above, the definition of the methodology to allocate the allowed target revenues to tariffs and the publication of the tariffs.

This reference to the Directive 2009/73/EC implies that the fully application of the Regulation (EC) 460/2017 requires a transposition of the Directive 2009/73/EC that includes in the definition of the methodology all of this elements.

The article 31 of the Royal Decree 949/2001 establish the structure of the transmission and distribution tariff that includes an entry tariff (“Término de reserva de capacidad”) and an exit tariff (“Término de conducción”). The exit tariff (“Término de conducción”) includes the transmission and distribution tariff jointly, and it is not possible to know, for a specific tariff, the transmission tariff.

As a result, the CNMC could not comply with the publication requirements of Regulation (EC) Nº. 460/2017.

The Ministerial ETU/1977/2016, of December 23, established the rates, tolls and fees for third-party access to gas installations applicable in 2017 according to the Act 18/2014.



actions from balancing. These values are published in the Resolution of the General Directorate of Energy Policy and Mining, dated 28 September 2016, to approve Procedure PD-18 “Technical parameters that determine the normal operation of the transmission network and balancing actions at the Virtual Balancing Point (PVB).

|                           |              |
|---------------------------|--------------|
| Maximum Operational limit | 2.997 GWh    |
| Alert Band                | 2.948 GWh    |
| Surveillance Band         | 2.899 GWh    |
| Indifference Band         | VR 2.850 GWh |
| Indifference Band         | 2.801 GWh    |
| Surveillance Band         | 2.752 GWh    |
| Alert Band                | 2.703 GWh    |
| Minimum Operational Limit |              |

**Figure 17. Stock band to determine balancing actions**

**Source. ENAGAS**

When the stock of gas transmission network stands at the band of surveillance, the ENAGAS-GTS can perform balancing actions, taking into account not only the level of stock at that time, but also the future forecast and MIBGAS situation. When the stock level is placed in the alert band, the TSO must perform balancing actions in any case.

Along 2017 ENAGAS-GTS has made balancing actions 64 days by a total amount of 1.657 GWh (1.107 GWh of gas purchases and 505 GWh of gas sales), through intraday and daily products. The average price of purchases was 24,66€/MWh, with a maximum price of 42,00 €/MWh on the 11 January 2017 and minimum price of 16,20€/MWh on the 14 March 2017.

### Capacity allocation mechanisms

The European regulation has been transposed in Spain, France and Portugal resulting in a set of harmonized rules for capacity allocation in all borders.

In this regard, CNMC approved the Circular 1/2014, dated 12<sup>th</sup> February, establishing capacity allocation mechanisms (CAM) to be applied at international connections by pipeline with Europe.

With the implementation of the CAM NC, auctions in the South Gas Regional Initiative (including France, Spain and Portugal) allocated capacity at all interconnections between entry-exit systems in the whole region, in VIPs between Portugal, Spain and France (mostly bundled capacity).



TSOs and NRAs have worked in a coordinated way on the CMPs harmonisation in the South region. The rules for the implementation of the three mechanisms already in force (over-subscription and buy-back OSBB, capacity surrender and long term use-it-or-lose-it) have been developed.

There has been progress in the implementation of the CMP GLs in the three countries of the South GRI. The NRAs and TSOs have agreed on the details of the coordinated mechanism for over-subscription and buy-back<sup>22</sup>.

Apart from the progress on CAM early implementation, it is also remarkable specifically the progress made by SGRI on issues such as increase interconnection capacity with the rest of Europe, increase transparency, implementation of the Directive and development of gas markets.

#### 4.1.5 Compliance

##### Compliance of regulatory authorities with binding decisions of the Agency and the Commission

The Spanish NRA has to comply with and put into practice those pertinent and binding decisions issued by ACER and the EC. Throughout 2017, there weren't any binding decisions issued by the EC or ACER towards the Spanish NRA.

##### Compliance of transmission and distribution companies, system owners and natural gas undertakings with relevant Community legislation, including cross-border issues

CNMC ensures compliance of transmission and distribution system operators and, where relevant, system owners, as well as of any gas undertakings with the relevant Community legislation, including cross-border issues.

CNMC is entitled to monitor the level of transparency and competitiveness (including of wholesale prices), and the level and effectiveness of market opening and competition at wholesale and retail levels; CNMC has the power to carry out investigations and to impose legally binding decisions.

CNMC has powers to request any information from gas undertakings. In this regard, CNMC shall issue the so-called "Circulars" that must be published in the Official State Journal, detailing and specifying the content of the information to be requested.

#### 4.2 Market functioning

According to the Act 3/2013, CNMC is in charge of monitoring the level of prices, the level of transparency, the level and effectiveness of market opening and competition at the Spanish gas markets.

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<sup>22</sup> Specifications of communication, timelines for the additional capacity offer, calculation of trigger values, buy-back process via PRISMA, as well as the split of costs between TSOs for the buy-back procedure.

#### 4.2.1 Wholesale markets

##### Wholesale market indicators

The following table summarizes the main indicators of the wholesale gas market in Spain in 2017:

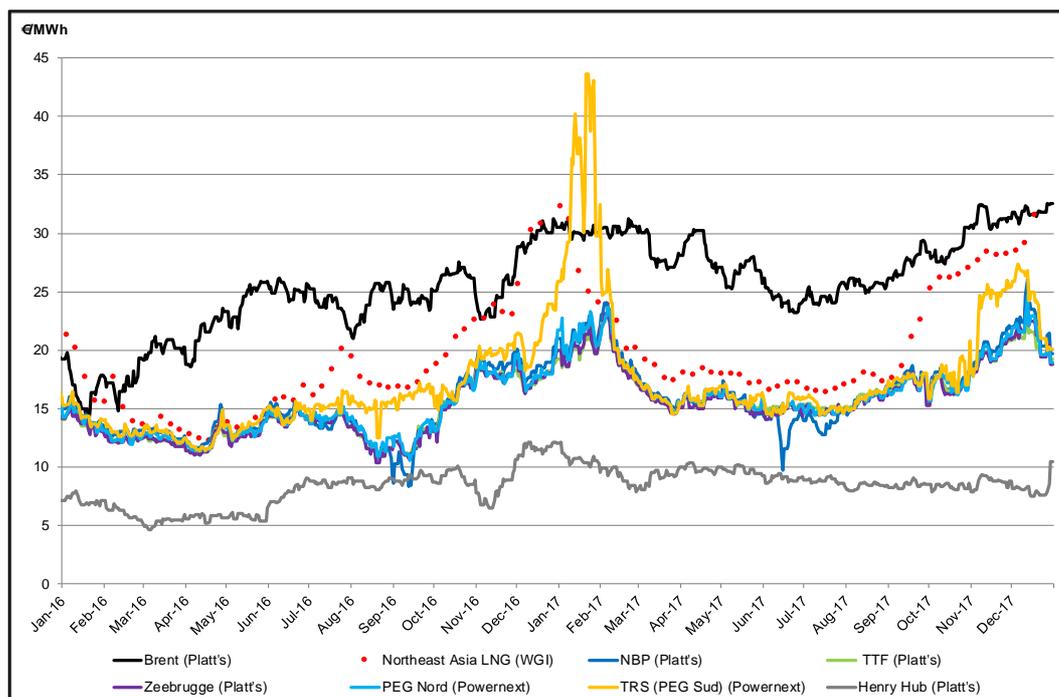
| Wholesale market indicators                             | Year 2017                  |  |
|---|----------------------------|--|
| National Gas Production                                 | 408 GWh                    |  |
| Gas Consumption   | 350.888 GWh                | +9,3%  |
| Import by pipeline and LNG                              | 53% Pipeline / 47% GNL     |  |
| Main origin of gas suppliers                            | Algeria (48%)              |  |
| Number of origins of gas supplies.                      | 12                         | +2   |
| Number of registered traders in Spain                   | 171                        | 30 new traders registered in 2017 (9 unregistered) |
| Number of traders bringing gas to Spain                 | 27                         | +4   |
| Market share of the largest entity bringing natural gas | 38,0% (Gas Natural Fenosa) | 42,7% in 2016                                      |
| HHI for gas imports[1]                                  | 2808                       | 3635 in 2016                                       |
| Gas import prices to Spain (2017 average)               | 17,55 €/MWh                | +1,97 €/MWh  |
| Number of traders active in the wholesale market (OTC)  | 87                         | +10  |
| Trading volume in the OTC gas market                    | 515.767 GWh                | +18,9%   |
| Number of transactions in the OTC                       | 176.753                    | +42,2%   |
| Number of traders registered in MIBGAS exchange         | 65 (end 2017)              | +21  |
| Trading volume at MIBGAS                                | 13.376 GWh                 | +103,7%  |
| Spot gas price at MIBGAS (Day Ahead product)            | 21,01 €/MWh                | +3,99 €/MWh  |
| Number of transactions at MIBGAS                        | 27.005                     | +16.398  |

**Table 17. Main Wholesale market indicators**

**Source: CNMC**

### 4.2.1.1 International gas markets

One of the most notable elements of the gas market developments since 2010 is the large price differential between regional gas markets, although during 2016 and 2017 prices in Europe and Asia have approached mainly in the first three quarters of the year. In 2017, the European markets and the American market have diverged significantly during the second half of the year.



**Figure 18. Evolution of natural gas spot prices (€/MWh) (Jan 2016 - Dec 2017)**

**Source: Platts, Powernext & World Gas Intelligence**

In the US market the new production technologies have sharply reduced the costs of production of unconventional gas, lowering gas prices and decoupling gas prices compared to oil. The Japan market, whose supply is only possible through LNG, has increased its imports of LNG for electricity production from March 2011. In addition, several emerging countries in Asia (China and India) and South America (Brazil, Argentina, Chile) have begun to import LNG, contributing to the increase in international market prices of LNG.

During 2017 gas prices in Europe and Asia have converged in the first three quarters of the year, but they diverged since September because of the increase in Asian LNG demand (mainly China); the European prices have also increased since August.

In Europe, with intermediate price levels, the existence of a network of highly interconnected gas transportation hubs allows northern and central Europe show a remarkable convergence of prices, and some decoupling on the price of oil.

In 2017, international oil and gas markets suffered major changes:

- Spot oil prices increased from 54,7 dollars/barrel in January to 64,2 dollars/barrel by the end of the year. 2017 was another volatile year for oil markets, with oil prices finally appearing on track to a sustainable recovery.
- Gas prices recovered from the lower values of preceding year. The yearly average price of new hubs day-ahead products across 2017 was circa 20% higher than in 2016. Coal and oil prices upswings fed gas price increases.
- During 2017 global LNG exports were 12% up (with China absorbing 40% of the new production, surpassing South Korea). The situation in LNG market started to change in 2015, with the increase of production in Australia and the beginning of production of LNG in U.S.A. during 2016. During most of 2016 and 2017, the differences between LNG prices in Asian and European markets have reduced to 2-3 €/MWh, with equal prices during the summer of 2016, but with an increasing difference during both winters due to higher demand.
- Europe saw record piped natural gas imports in 2017, with Russian gas again seizing a sizeable chunk of market share year on year (Russian piped gas market share rises to 36%), compensating for dwindling domestic European production (Groningen). LNG imports reached a five year high in 2017, boosted by strong deliveries to higher-priced southern Europe markets and the closure of Rough storage facility.

#### **4.2.1.2 Spanish Gas import prices**

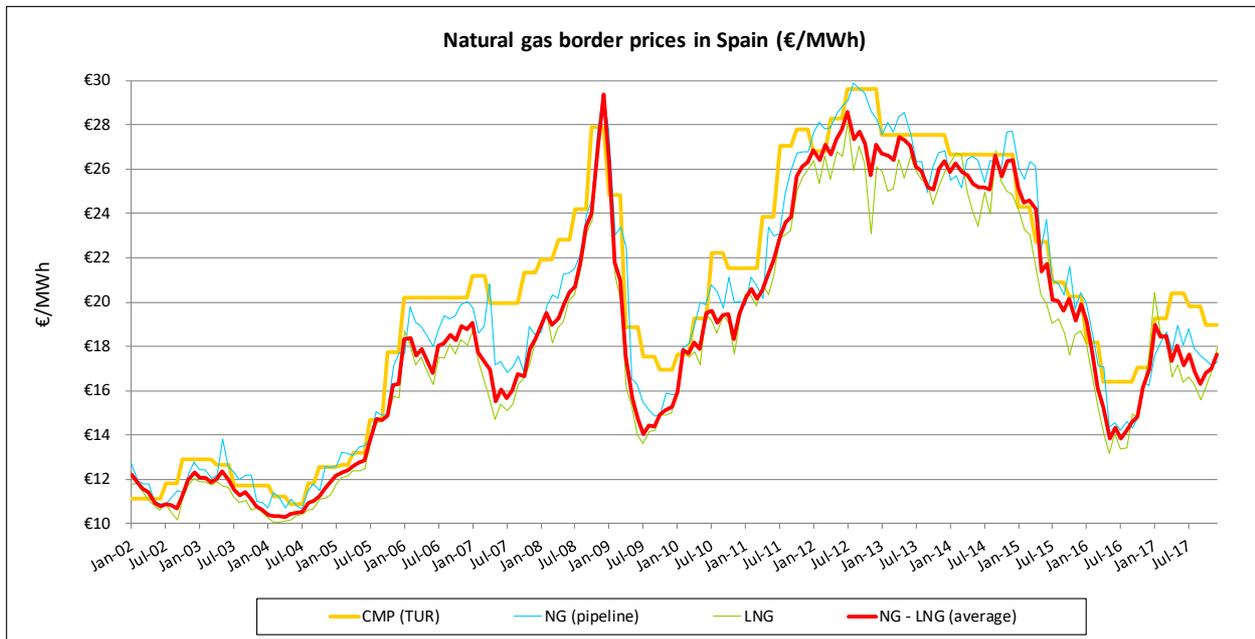
Spain imports most of the gas it consumes, since its gas production is negligible; a majority of long term contract are oil-indexed. Another relevant factor that influences gas price in Spain is the importance of LNG in gas procurement (see chapter 4.3 Security of supply).

In order to provide a price reference for gas in Spain, CNMC has developed an index of natural gas border prices, from gas imports data, which is available at CNMC website<sup>23</sup> based on the data provided by Customs of the Spanish Tax Agency (AEAT).

Gas import prices increased sharply in the second half of 2016, and started 2017 at a level of 19 €/MWh. During 2017 prices have decreased slightly until the end of the summer, and in the last quarter of the year they started to increase up to a price band between 17-18 €/MWh, reflecting several months later the increase of oil prices since June 2017. This has continued during the first months of 2018.

The following figure shows the evolution of natural gas prices from January 2002 to December 2017 at the border (according to this index), including LNG and natural gas introduced to Spain through pipelines from Morocco, Algeria and France.

<sup>23</sup> <http://www.cnmc.es/es-es/energ%C3%ADa/hidrocarburos/gaseosos/mercadomayorista.aspx>



**Figure 19. Evolution of natural gas border prices in Spain (€/MWh) (Jan 2002 - Dec 2017)**

**Source: AEAT and CNMC**

The table below shows the monthly evolution of these prices in 2017 (in €/MWh), indicating that LNG imports were more competitive than pipeline imports during the period of March to November (except during the months of winter):

| (€/MWh)  | Natural gas (pipeline) | LNG   | Average import price |
|----------|------------------------|-------|----------------------|
| Jan 2017 | 17,54                  | 20,40 | 18,98                |
| Feb 2017 | 18,09                  | 18,71 | 18,42                |
| Mar 2017 | 18,65                  | 18,21 | 18,46                |
| Apr 2017 | 17,82                  | 16,62 | 17,34                |
| May 2017 | 18,93                  | 17,15 | 18,01                |
| Jun 2017 | 18,06                  | 16,38 | 17,12                |
| Jul 2017 | 18,77                  | 16,61 | 17,62                |
| Aug 2017 | 17,90                  | 16,27 | 16,85                |
| Sep 2017 | 17,57                  | 15,60 | 16,32                |
| Oct 2017 | 17,36                  | 16,20 | 16,78                |
| Nov 2017 | 17,09                  | 16,92 | 17,00                |
| Dec 2017 | 17,33                  | 17,97 | 17,66                |

**Table 18. Natural gas border prices in Spain, 2017**

**Source: AEAT and CNMC**

### 4.2.1.3 Spanish Wholesale markets

#### a) Spanish OTC gas market (Enagas MS-ATR Platform)

Most of the gas traded in the Spanish market is traded in bilateral OTC transactions. The gas traded on the OTC market is notified to the system operator, in order to register the title transfer, through the ENAGAS “MS-ATR platform”. There are 87 active traders in this platform.

The entry of new competitors in the market is very dynamic, and the number of traders registered in Spain has continued increasing since the beginning of liberalization. In 2017, 25 new traders have been registered.

This includes the incorporation of companies involved in international gas trading as Statoil, ENI, Vitol, Koch, Gunvor, Alpic, Gasela, ArcelorMittal, Merrill Lynch, Morgan Stanley and Goldman Sachs or Gazprom, although most of them are not operating in the retail market (not making sales to final customers).

At the moment, gas is actively traded in Spain across eight balancing points: the six LNG terminals; the virtual balancing point (so called PVB) and the virtual storage point comprising the four Spanish underground storage sites in operation (Serrablo, Gaviota, Marismas and Yela).

The volume of gas traded stood at 515.767 GWh in 2017, with a 18,9% increase from 2016, and is a 47,0% higher than the demand of the year, with more than 10.000 transactions per month. Many of the trades are temporary swap, as the OTC market is mainly used as a tool to manage the stocks of LNG and gas balance.

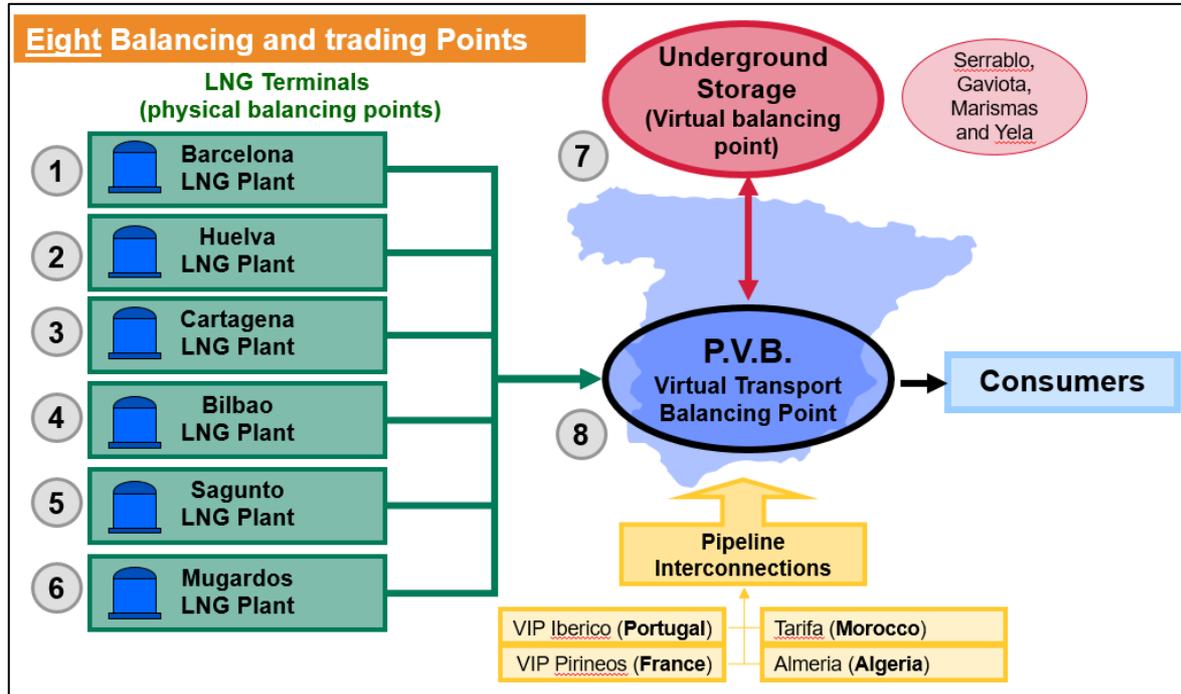


Figure 20. Balancing and trading points

Source: CNMC

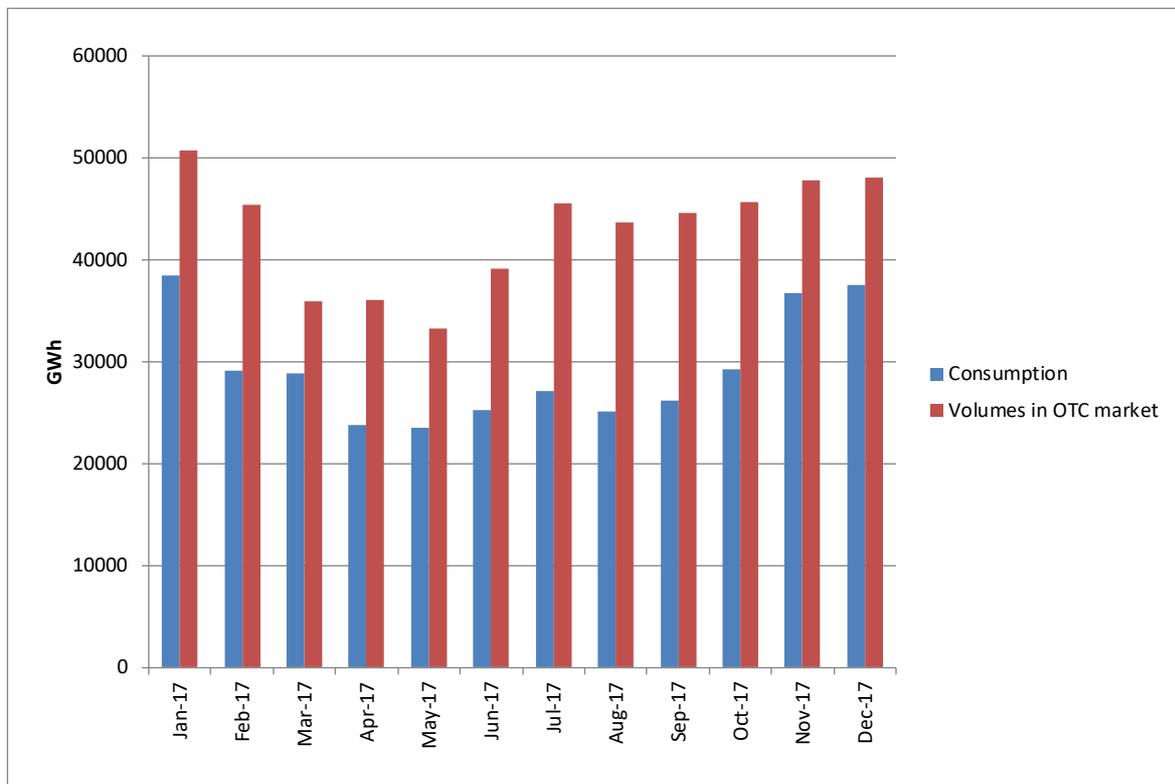


Figure 21. Spanish OTC gas market vs consumption 2017 (GWh/month)

Source: ENAGAS and CNMC

Liquidity lies mainly on the LNG terminals, which accounted for 53,3% of all OTC trade in 2017. Barcelona LNG terminal was the main trading point with 24,7% of gas trade. The PVB, which could look like an attractive virtual trading point, increased its operations since last year and it drew 46% of OTC trade in 2017.

| Balancing point               | Traded gas 2017 (GWh) | Production (GWh) | Churn rate | Number of active traders | Market share of 3 main traders |
|-------------------------------|-----------------------|------------------|------------|--------------------------|--------------------------------|
| Barcelona LNG Terminal        | 127.422               | 59.954           | 2,1        | 42                       | 45%                            |
| Huelva LNG Terminal           | 42.564                | 48.374           | 0,9        | 31                       | 63%                            |
| Bilbao LNG Terminal           | 56.477                | 29.916           | 1,9        | 26                       | 59%                            |
| Cartagena LNG Terminal        | 8.780                 | 9.377            | 0,9        | 25                       | 59%                            |
| Mugardos LNG Terminal         | 9.880                 | 11.756           | 0,8        | 20                       | 65%                            |
| Sagunto LNG Terminal          | 29.676                | 21.614           | 1,4        | 25                       | 58%                            |
| <b>Total LNG</b>              | <b>274.799</b>        | <b>180.991</b>   | <b>1,5</b> | <b>51</b>                | <b>36%</b>                     |
| Underground storage (UUSS)    | 3.497                 |                  |            | 21                       | 68%                            |
| Virtual balancing point (PVB) | 237.471               | 169.897          | 1,4        | 77                       | 22%                            |
| <b>Total Spain</b>            | <b>515.767</b>        | <b>350.888</b>   | <b>1,5</b> | <b>82</b>                | <b>27%</b>                     |

**Table 19. Main features – OTC**

**Source: ENAGAS**

Transactions in the Spanish OTC market in 2017 represented globally 1,47 times natural gas demand.

Next figures show the monthly evolution of gas traded and number of transactions – around 176.700 – registered in the Spanish OTC market in 2017.

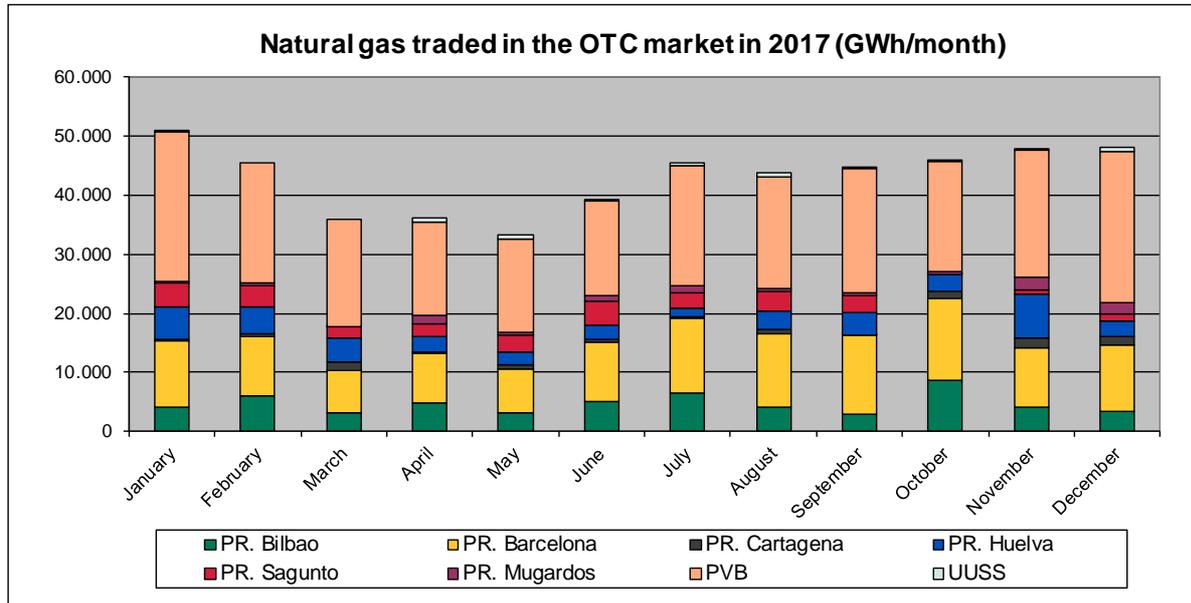


Figure 22. Gas traded in the OTC market during 2017

Source: ENAGAS

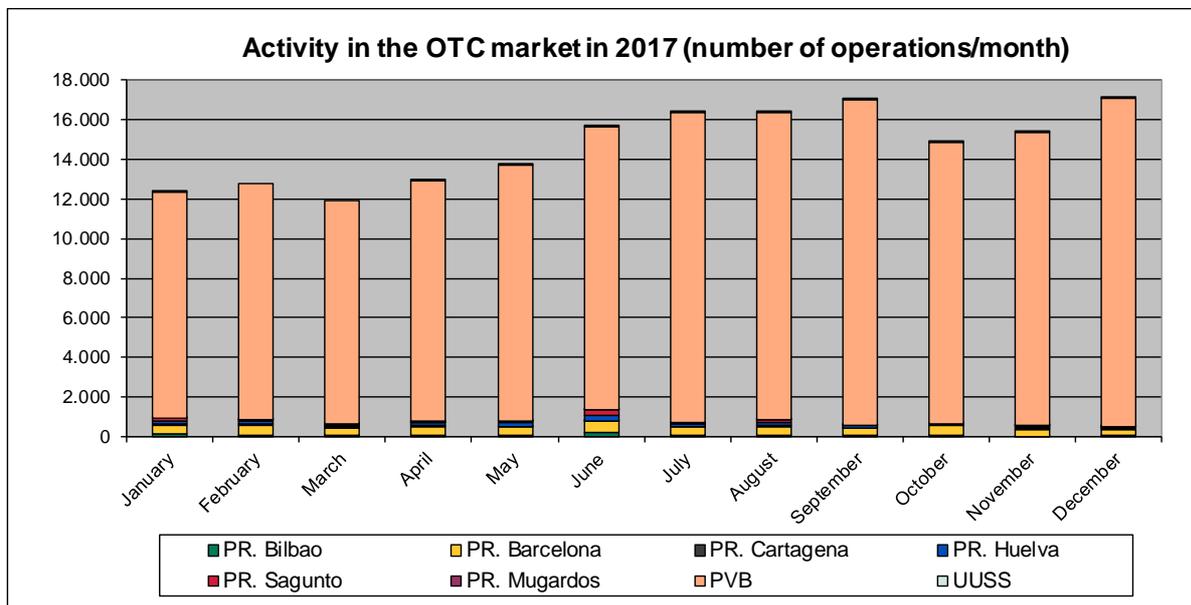


Figure 23. Gas transactions in the OTC market in 2017 (n° Transactions/month)

Source: ENAGAS

**b) Spanish gas exchange market (MIBGAS)**

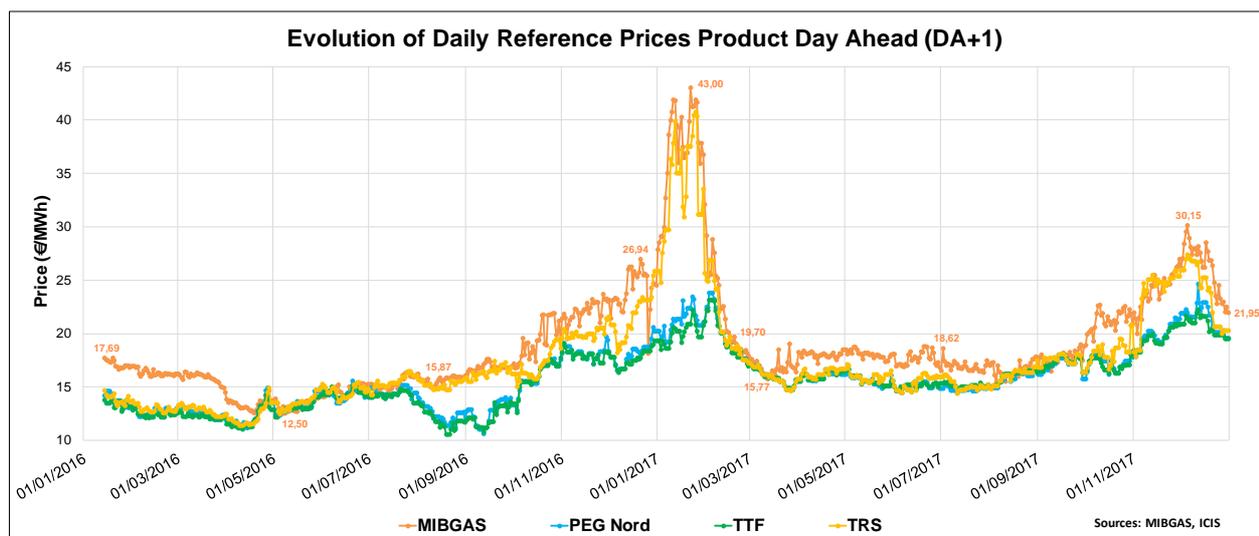
Trading activity at the MIBGAS exchange started on December 16, 2015, with the negotiation of six different products for the Spanish market: Within Day, Day-Ahead (D+1, D+2, D+3), Balance of Month and Month-Ahead (M+1). The activity of the gas market during his first year was characterised by a low liquidity in the first half of the year, and an increasing liquidity in the second half due to several liquidity measures introduced by the regulator.

These measures can be summarised in the acquisition of operational and cushion gas, and balancing actions by the TSO.

In 2017, additional liquidity measures were approved in order to increase the liquidity in the market, including:

- MIBGAS established a contest for the service of Market Maker for the first and second half of 2017. The service was assigned to the trading companies Gunvor International and Axpo Iberia respectively. This measure has continued during 2018, with the enterprise Engie assigned for the first half of the year.
- The Government established that the Spanish dominant players (Gas Natural Fenosa and Endesa) should also provide the service of Market Maker in MIBGAS, for the product D+1 and M+1. This obligation started in January 2018.

The next figure shows the evolution of the prices for the product D+1 in comparison with other European markets (TTF, Peg Nord, TRS) the last two years.



**Figure 24. Evolution of Daily Reference Prices**

**Source. MIBGAS, ICIS**

The evolution of the price for the daily product in MIBGAS (DA+1) in the year 2017 can be divided in 3 periods:

- In the first part of 2017, prices in the Spanish market MIBGAS and in the French market TRS (South France) rocketed over 40 €/MWh due to the increase of LNG prices in the international markets and the congestion in the French transport system. In January, the price reached over 20 €/MWh higher than the price in the main European markets, but in February the prices were coupled, with differences lower than 1 €/MWh.
- From March to September, price in MIBGAS was similar to the rest of European markets, with differences between 1 and 3 €/MWh, and near to zero in September. There were a slightly decreasing price trend in this period, from 18 to 16 €/MWh.
- At the last quarterly of 2017, price in MIBGAS separated from North-European markets and continued to increase; in December, prices reached levels of 30 €/MWh. On the contrary, the prices in European markets started to increase later in November, at the beginning of winter period due to a higher gas demand, and they reached price levels of 25-26 €/MWh. The differential with MIBGAS were between 2 and 9 €/MWh in this period, with a sharp decrease in the Spanish prices by the end of the year.

The next figures show the spread between the Spanish market MIBGAS and the French markets (TRS and Peg Nord) in the product Day Ahead:







The next figure shows the evolution of volume negotiated by type of trade:

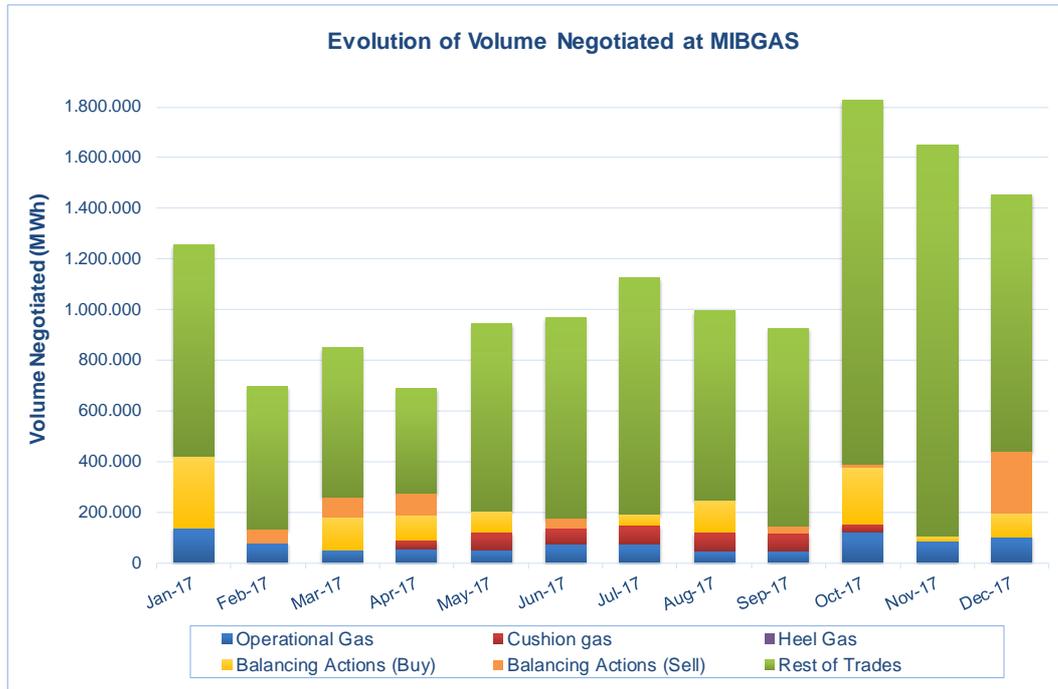


Figure 29. Volume negotiated by type of trade

Source: MIBGAS

All the spot market prices and volumes are published at MIBGAS website ([www.mibgas.es](http://www.mibgas.es)) on a daily basis.

#### 4.2.1.4 Wholesale market monitoring and effectiveness of competition

##### Market monitoring

The Spanish NRA develops its monitoring functions of market opening and competition in wholesale and retail markets issuing periodic reports (monthly reports for wholesale markets and quarterly reports for retail markets).

Furthermore, the monthly monitoring report on wholesale market follows up the evolution of prices in the international markets to compare them with domestic gas prices.

#### 4.2.2 Retail market

##### Retail market indicators

The following table summarizes the main indicators of the retail gas market in Spain in 2017:



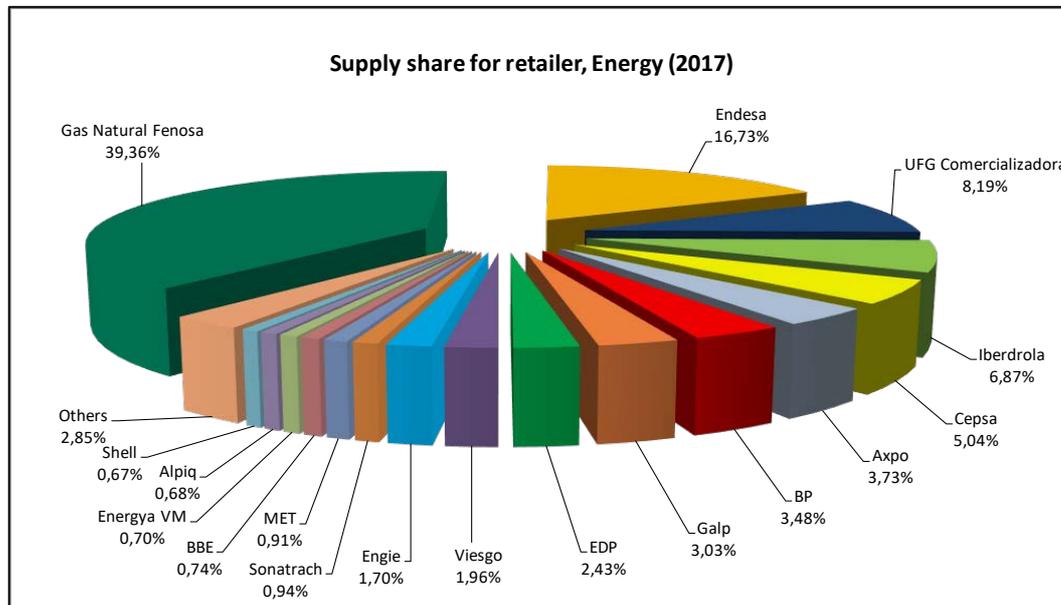


Figure 30. Share of natural gas supplies by company (in energy volume)

Source: CNMC

In December 2017, the total number of gas consumers was 7.782.082 (+109.400 consumers with regard to December 2016).

In terms of number of customers, the sharing-out of supplies at 31 December 2017 is shown in the next figure:

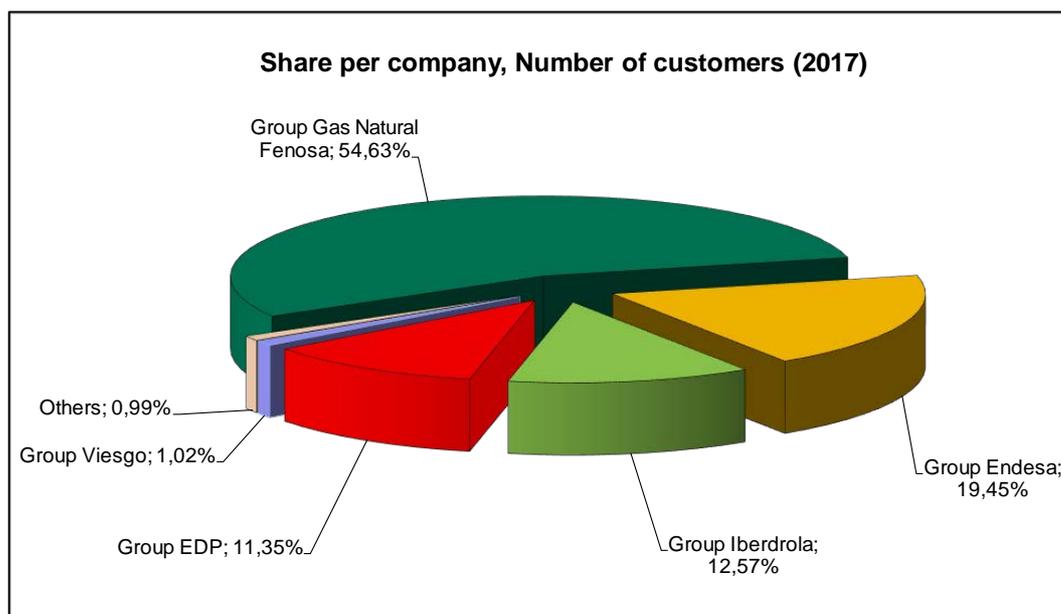


Figure 31. Share of natural gas supplies by company (in number of customers)

Source: CNMC



| Consumption groups<br>(Pressure range and annual consumption) | MWh                | Number of<br>Consumers<br>(31 Dec 2016) |
|---|--------------------|---|
| <b>Group 1 ( Pressure &gt;60 bar)</b>                         |                    |   |
| 1.1: Consumption <= 200 GWh/year.                             | 3.770.165          | 42                                      |
| 1.2: Consumption > 200 GWh/year <= 1.000 GWh/year.            | 26.317.130         | 35                                      |
| 1.3: Consumption > 1.000 de GWh/year.                         | 108.734.540        | 46                                      |
| <b>TOTAL Group 1</b>  | <b>138.821.835</b> | <b>123</b>                              |
| <b>Group 2 ( Pressure &gt;4 bar and &lt;= 60 bar)</b>         |                    |   |
| 2.1: Consumption <= 500.000 KWh/year.                         | 377.293            | 664                                     |
| 2.2: Consumption > 500.000 KWh/year <= 5 GWh/year.            | 3.075.583          | 1.431                                   |
| 2.3: Consumption > 5 GWh/year <= 30 GWh/year.                 | 13.835.658         | 1.046                                   |
| 2.4: Consumption > 30 GWh/year <= 100 GWh/year.               | 20.543.266         | 359                                     |
| 2.5: Consumption > 100 GWh/year <= 500 GWh/year.              | 51.609.449         | 244                                     |
| 2.6: Consumption > 500 GWh/year.                              | 37.569.385         | 39                                      |
| <b>TOTAL Group 2</b>  | <b>127.010.635</b> | <b>3.783</b>                            |
| <b>Group 3 ( Pressure &lt;=4 bar )</b>                        |                    |   |
| 3.1: Consumption <= 5.000 kWh/year                            | 11.420.389         | 4.619.338                               |
| 3.2: Consumption > 5.000 kWh/year <= 50.000 kWh/year.         | 27.458.657         | 3.083.935                               |
| 3.3: Consumption > 50.000 kWh/year <= 100.000 kWh/year.       | 1.563.625          | 24.862                                  |
| 3.4: Consumption > 100.000 kWh/year <= 1 GWh/year             | 21.468.286         | 47.720                                  |
| 3.5: Consumption > 8 GWh/year.(night consumption)             | 4.749.083          | 1.609                                   |
| <b>TOTAL Group 3</b>  | <b>66.660.041</b>  | <b>7.777.464</b>                        |
| <b>Group 4 ( Interruption )</b>                               |                    |   |
| <b>(Pressure &gt; 60 bar)</b>                                 |                    |   |
| 4.1:Consumption <= 200 GWh/year.                              |                    |   |
| 4.2:Consumption ia 200 GWh/year.<= 1000 GWh/year.             |                    |   |
| 4.3:Consumption > 1000 GWh/year.                              |                    |   |
| <b>( Pressure &gt;4 bar and &lt;= 60 bar)</b>                 |                    |   |
| 4.4:Consumption <= 30 GWh/year.                               |                    |   |
| 4.5:Consumption > 30 GWh/year <= 100 GWh/year.                |                    |   |
| 4.6:Consumption > 100 GWh/year <= 500 GWh/year.               |                    |   |
| 4.7: Consumption > 500 GWh/year.                              |                    |   |
| <b>TOTAL Group 4</b>  | <b>0</b>           | <b>0</b>                                |
| Non-energetic use (raw material)                              | 5.648.197          | 3                                       |
| LNG satellite plant for a single consumer                     | 9.776.619          | 706                                     |
| <b>TOTAL</b>  | <b>347.917.327</b> | <b>7.782.079</b>                        |

**Table 21. Natural gas consumption and number of consumers in 2017**

**Source: CNMC**

The previous table shows the gas consumption in the Spanish market, broken down by levels of pressure and consumption, according to the different tariff groups existing in the Spanish gas system for the characterisation of consumers.

### Evolution of gas market shares

At the end of 2017, there were 171 companies registered as suppliers in the Spanish gas market. The number of suppliers in the liberalised market is shown in the next table:



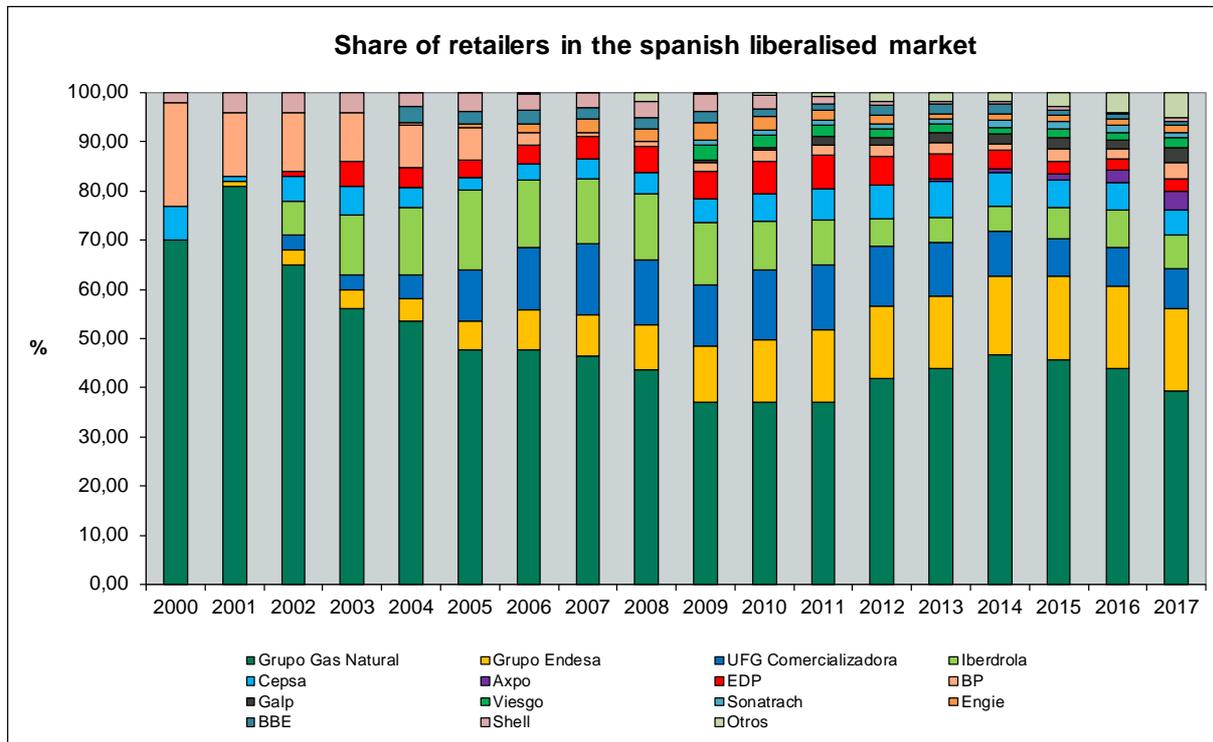


Figure 34. Spanish retail gas market. Sharing-out in terms of energy

Source: CNMC

Switching rate and cuts for non-payments

The Royal Decree-Law 13/2012, of March 30<sup>th</sup>, introduced a general time limit of three weeks for the switching process in gas.

In 2011 and 2012, consumer activity gathered momentum and recorded a very high switching rate, but after that, switching rate has remained stable.

With respect to total changes supplier of natural gas, in 2017 was 756.316 changes, equivalent to 9,6% of gas customers in Spain, moderately lower than the figure of 2016 (955.491 changes).

| Gas Switching Data 2012-2017        |               |               |              |               |               |              |
|-------------------------------------|---------------|---------------|--------------|---------------|---------------|--------------|
|                                     | 2012          | 2013          | 2014         | 2015          | 2016          | 2017         |
| Domestic switching rate             | 19.36%        | 11.78%        | 9.95%        | 11.15%        | 12.50%        | 9.61%        |
| Number of domestic customers        | 7,323,988     | 7,396,840     | 7,498,055    | 7,567,319     | 7,652,353     | 7,755,645    |
| <b>Total switching rate</b>         | <b>19.32%</b> | <b>11.83%</b> | <b>9.99%</b> | <b>11.21%</b> | <b>12.50%</b> | <b>9.69%</b> |
| Number of all customers             | 7,398,013     | 7,470,174     | 7,548,867    | 7,617,385     | 7,704,227     | 7,809,088    |
| Number activated supplier's changes | 1,394,644     | 890,103       | 754,167      | 866,571       | 955,491       | 756,316      |

**Table 23. Gas switching data 2012-2017**

**Source: CNMC, OCSUM**

The number of natural gas supply interruptions for non-payment in 2017 was approximately of 18.991 (representing 0,25 cuts every 100 customers in the domestic market). This number is only a third of the number of supply interruptions made in 2016, due to the economic recovery and the additional measures to protect vulnerable customers from disconnections.

### DSOs

Nowadays there are five DSOs Groups in Spain:

- Nedgia Group, owned by Gas Natural Fenosa (69% supply points)
- Nortegas Group (12% supply points)
- Madrileña Red de Gas, with 856.161 supply points (11%)
- Redexis Group, with 545.281 supply points (7%)
- Gas Extremadura with 74.167 supply points (0,9%)

At the beginning of 2018, only the main DSO (Nedgia - Gas Natural Fenosa) remains as a company vertically integrated with the supplying activity.

### Regulated tariffs

Since July 2008, regulated tariffs for end-users (last resort tariff, TUR) only apply to residential consumers consuming less than 50.000 kWh/year and connected to a network at a pressure under 4 bar. There are four suppliers designated as suppliers of last resort, which supply all consumers submitted to the last resort tariff.

The number of customers supplied at regulated tariff continues the decreasing trend.









### 4.3.2 Evolution of gas demand and gas demand scenarios

#### Evolution of gas demand

In 2017, the Spanish gas demand increased by 9,3%, to 350.888 GWh. This is the third consecutive year of increasing gas demand, starting in 2015. From 2008 to 2014, the gas demand decreased by 33%, mainly because of the decrease in gas consumption for electricity generation.

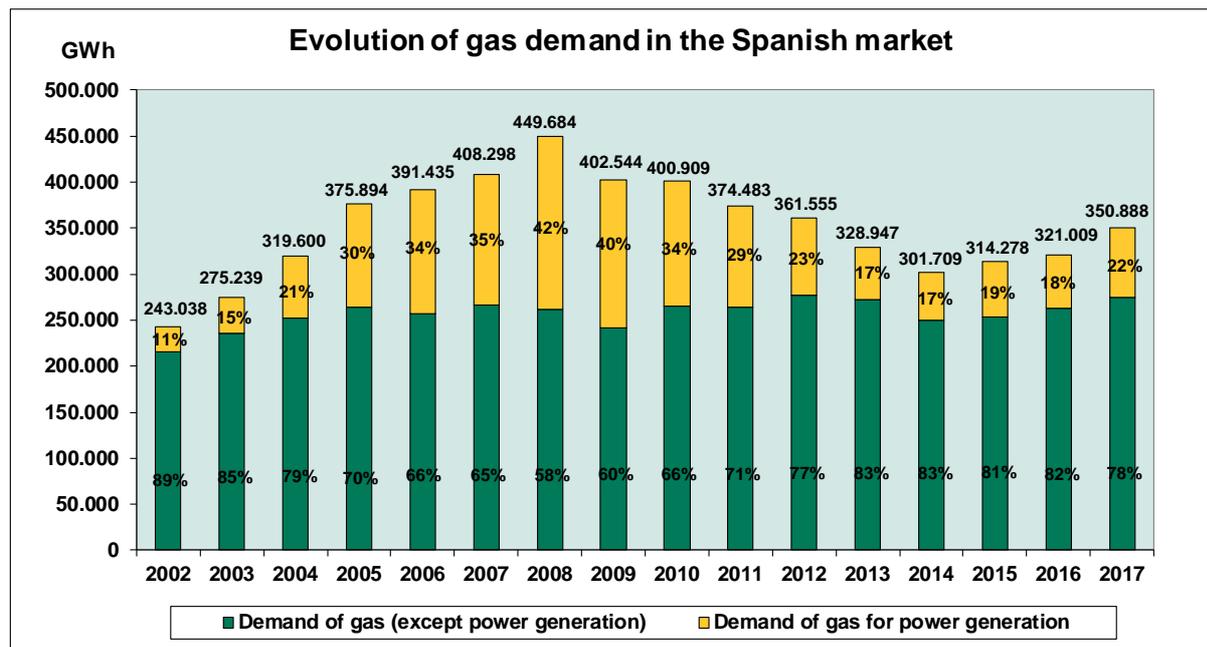


Figure 38. Evolution of gas demand in the Spanish market (2002 - 2017)

Source: ENAGAS, CNMC

In 2017, gas consumption for electricity generation increased by 29,4%, mainly because of a great decrease of hydroelectric production and wind power. In this year, the industrial consumption of gas increased by 7,4%, mainly as a result of the recovery of industrial activity. Finally, the household consumption decreased by 1,3% in 2017, as a result of higher temperatures during 2017 and despite the increase of around 80.000 in the number of gas consumers.

The next table shows the evolution of gas demand in the Spanish market in 2017.

|   | 2016<br>(GWh)  | 2017<br>(GWh)  | Annual<br>Variation<br>(%) |
|---|----------------|----------------|----------------------------|
| Demand of gas (except power generation) | 262.536        | 275.215        | 4,8%                       |
| Demand of gas for power generation      | 58.473         | 75.673         | 29,4%                      |
| <b>Total demand in Spain</b>            | <b>321.009</b> | <b>350.888</b> | <b>9,3%</b>                |

**Table 25. Gas demand in Spain in 2017 vs 2016**

**Source: CNMC**

#### Gas demand scenario

A stabilization of the gas demand with regard to the current value is expected, with a slight increase of conventional demand and the demand for electricity generation, largely because of increases in renewable sources, mainly wind power. Nevertheless, it must be noticed that demand for power generation is difficult to forecast, as it can be affected by several annual circumstances: coal versus gas prices, generation with hydro power (depending on the level of reserves of water for hydroelectric power) and the amount of electricity produced renewable sources.

CNMC's demand forecast for the period 2017-2022 in Spain is detailed in the following table:

| Energy Demand (TWh)                  | 2017<br>(Real) | 2018       | 2019       | 2020       | 2021       | 2022       |
|--------------------------------------|----------------|------------|------------|------------|------------|------------|
| Gas demand (except power generation) | 275            | 259        | 261        | 262        | 263        | 264        |
| Gas demand for power generation      | 76             | 56         | 56         | 58         | 62         | 64         |
| <b>Total gas demand in Spain</b>     | <b>351</b>     | <b>315</b> | <b>316</b> | <b>320</b> | <b>325</b> | <b>328</b> |

**Table 26. Forecast of annual gas demand 2017-2022**

**Source: CNMC. Report on the Forecast of the evolution of different items of income and cost of natural gas system for the period 2017-2022**

It is important to underline that expected gas demand in 2022 is still expected to be below 2005 levels, so there is no need for new internal transmission infrastructures.

#### **4.3.3 Capacity of infrastructures and new investments**

Spain has international gas pipeline interconnections with Morocco, Portugal and France, and a direct connection with Algeria (Medgaz).

Six LNG import terminals are operational in the Spanish gas system, and one has been mothballed.

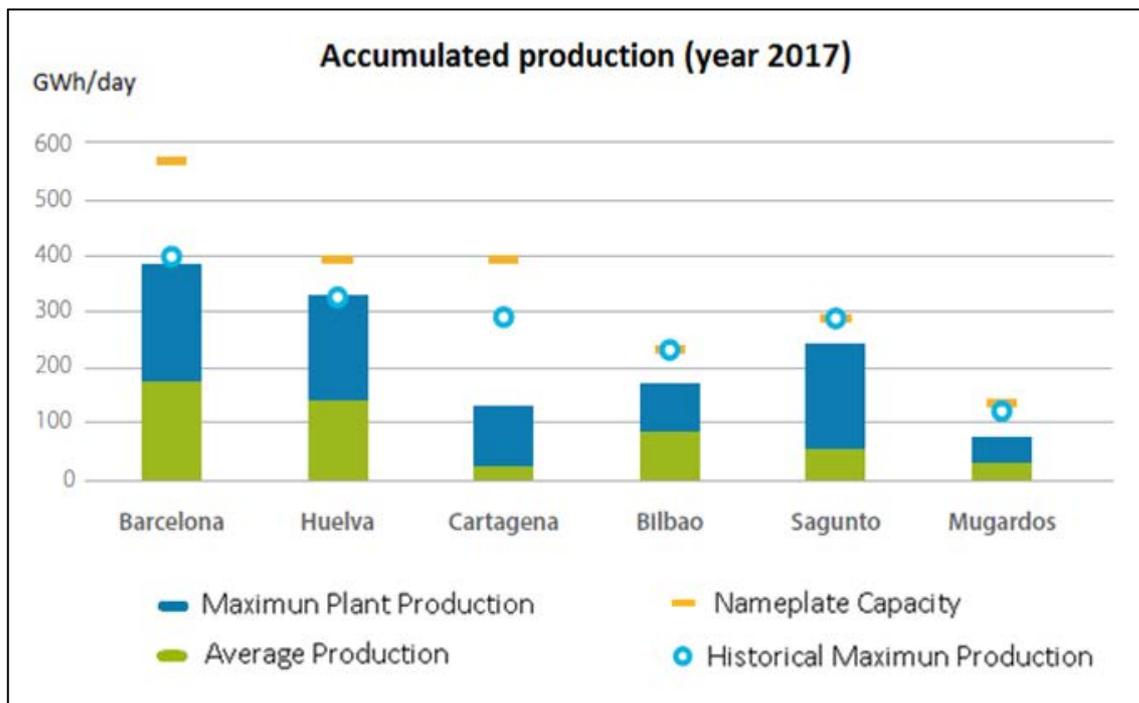
While LNG terminals represent around 62 bcm/year of entry capacity to the transmission network, the connection from Algeria through Morocco represents 12 bcm/year of import capacity (8

bcm/year to Spain and 4 bcm/year to Portugal), the direct connection with Algeria (Medgaz pipeline) adds 8 bcm/year and the connection with France at Larrau with 7,5 bcm/year importing capacity ( 5,5 firm capacity and 2 interruptible in the French side, and fully firm on the Spanish side) and 7,5 bcm/year exporting capacity.

**a) Capacity of LNG import terminals**

In Spain LNG regasification plants are all subject to regulated TPA, allowing the access to new capacity by the new entrants, which has favoured the development of gas competition in Spain.

The capacity use rate in 2017 was only 30,4% in average for the LNG plants, varying from 7% (the minimum, at Cartagena), to 44% (maximum, at Bilbao). In addition to that, there is a LNG terminal in Gijón (Musel) that is mothballed, as there is no need for this plant to be in operation with the current gas demand.



**Figure 39. Use rate of LNG terminals in 2017**

**Source: ENAGAS**

The following table shows the LNG storage and send-out capacity of each one of the six terminals:

| LNG Terminal | LNG storage capacity (m <sup>3</sup> ) | Send-out capacity (m <sup>3</sup> (n)/h) |
|--------------|--|--|
| Barcelona    | 760.000                                | 1.950.000                                |
| Huelva       | 619.500                                | 1.350.000                                |
| Cartagena    | 587.000                                | 1.350.000                                |
| Bilbao       | 450.000                                | 800.000                                  |
| Sagunto      | 600.000                                | 1.000.000                                |
| Mugardos     | 300.000                                | 412.800                                  |
| <b>TOTAL</b> | <b>3.316.500</b>                       | <b>6.862.800</b>                         |

**Table 27. Capacity of LNG terminals at Dec, 31 2017**

Source: ENAGAS

**b) Capacity of international pipeline interconnections**

Spain has several international gas pipeline connections to other countries: to Algeria through Morocco (Tarifa) and Almeria (Medgaz), to Portugal through Tuy and Campo Maior (Badajoz), and to France through Larrau and Irún.

The current capacities of international interconnections are the following:

| Interconnection        | Capacity (GWh/day) |
|------------------------|--------------------|
| VIP. Pirineos (ES->FR) | 225                |
| VIP. Pirineos (FR->ES) | 225 (*)            |
| VIP. Ibérico (ES->PT)  | 144                |
| VIP. Ibérico (PT->ES)  | 80                 |
| Tarifa (MO->ES)        | 444                |
| Almería (AL->ES)       | 290                |

(\*) *bundled firm capacity from Spain to France, interruptible from France to Spain*

**Table 28. Interconnection physical capacities at 31st December 2017**

Source: ENAGAS

Since January 1<sup>st</sup>, 2017, the capacity to import natural gas through the interconnection with France VIP. PYRENEES has increased by 60 GWh per day (during winter) and by 50 GWh per day during the summer (firm on the Spanish side, interruptible in the French side). This is an increase of 36%, going from the 165 GWh per day previously marketed in winter period (175 GWh per day the rest of the year) to 225 GWh per day during every month of the year.

In compliance with the code of network CAM, 60 GWh per day will be marketed as firm capacity, not coordinated, through auctions of capacity during winter (from October to March), while in the summer months will be 50 GWh per day capacity marketed as firm not coordinated, maintaining 175 GWh/day capacity sign coordinated.



| Entry (or exit) point      |               | Contracted capacity in 2017 (%) | Available capacity in 2017 (%) |
|----------------------------|---------------|---------------------------------|--------------------------------|
| Barcelona LNG terminal     |               | 35,2%                           | 64,8%                          |
| Sagunto LNG terminal       |               | 25,5%                           | 74,5%                          |
| Cartagena LNG terminal     |               | 7,4%                            | 92,6%                          |
| Huelva LNG terminal        |               | 42,1%                           | 57,9%                          |
| Mugardos LNG terminal      |               | 30,2%                           | 69,8%                          |
| Bilbao LNG terminal        |               | 43,9%                           | 56,1%                          |
| <i>TOTAL LNG TERMINALS</i> |               | 30,4%                           | 69,6%                          |
| Tarifa (import)            |               | 67,0%                           | 33,0%                          |
| Almeria (import)           |               | 81,0%                           | 19,0%                          |
| France (Larrau+Irun)       | Import (F=>E) | 71,0%                           | 29,0%                          |
|                            | Export (E=>F) | 56,0%                           | 44,0%                          |
| Portugal (Badajoz+Tuy)     | Import (F=>E) | 0,05%                           | 99,95%                         |
|                            | Export (E=>F) | 81,0%                           | 19,0%                          |

**Table 30. Contracted and Available capacities in 2017 (LNG terminal and Interconnections)**

**Source: ENAGAS**

**e) New investments in infrastructure**

New infrastructures in 2017

This new infrastructures have entered into operation in 2017:

- Yeles-Seseña pipeline: included in the Planning 2008-2016 and designed with a maximum service pressure of 59 bar, it is 9 km long and it has an 8 inches diameter.
- Villacarrillo-Villanueva del Arzobispo pipeline: also included in the Planning 2008-2016 and designed with a maximum service pressure of 49,5 bar. It is 12 km long and it has an 8 inches diameter.

Future investments

The large investments made in the gas sector in recent years and the decrease in demand have already created a surplus on capacity, and an imbalance between revenues and costs, albeit much lower than the past imbalances in the electricity sector.

The Royal Decree Law 13/2012 contains some measures in order to prevent further non needed expansion: (i) a moratorium on new regasification plants; (ii) a moratorium on administrative authorisations for new gas transport pipelines and metering stations. Also, the new LNG terminal























