ERSE
ENTIDADE REGULADORA
DOS SERVIÇOS ENERGÉTICOS

SELF-ASSESSMENT OF THE CURRENT STATE OF WHOLESALE MARKET FUNCTIONING

PORTUGAL

January 2017

ENTIDADE REGULADORA DOS SERVIÇOS ENERGÉTICOS

Este documento está preparado para impressão em frente e verso

Rua Dom Cristóvão da Gama n.º 1-3.º
1400-113 Lisboa
Tel.: 21 303 32 00
Fax: 21 303 32 01
e-mail: erse@erse.pt
www.erse.pt

TABLE OF CONTENTS

1 ASSESSMENT OF THE CURRENT STATE OF WHOLESALE MARKET FUNCTIONING BASED ON GTM METRICS

1.1 ASSESSMENT OF THE CURRENT STATE OF WHOLESALE MARKET FUNCTIONING

Natural gas was introduced to Portugal in 1997. As a consequence, gas is still a relatively young and developing sector (coupled with the geographic and interconnection circumstances of the Iberian Peninsula). Portugal is not a producer of natural gas, and negotiations and supplies are the first segment of the sector's value chain. The wholesale market for natural gas in Portugal does not have a price formation reference based on an organized market.

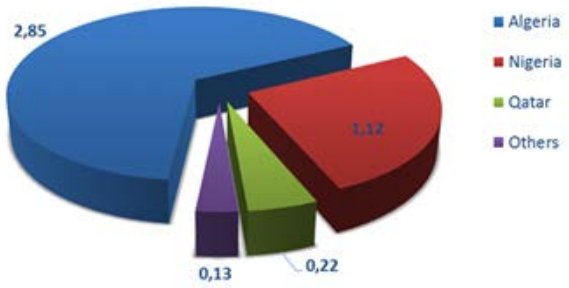
The Portuguese wholesale gas market lacks liquidity and transparency, which hinders the efficient allocation of resources, risk hedging and new entries. Portugal is not a transparent market, in the sense of a “market” whereby the sum of gas trading activities with delivery is agreed on a specific delivery point and is concluded using a transparent trading venue. Considering the above, it is not possible to calculate the Gas Target Model (GTM) metrics related to market participants’ needs such as: order book volume; bid-offer spread; order book price sensitivity and number of trades.

In the absence of an organized gas hub in Portugal, the current assessment presents elements that characterize imports, the wholesale market and the retail market, which are the basis for the conclusions presented on the state of the natural gas market in Portugal.

The functioning of the wholesale market is thus based on the design of international procurement strategies and the management of the infrastructure that comprises the national natural gas system (SNGN), namely interconnections, the LNG terminal and storage, which are critical aspects for the development of trading of natural gas in the wholesale market. The supply of natural gas to the Portuguese market is made through entrances to the SNGN via interconnections with Spain (Campo Maior and Valença) and the port terminal of Sines.

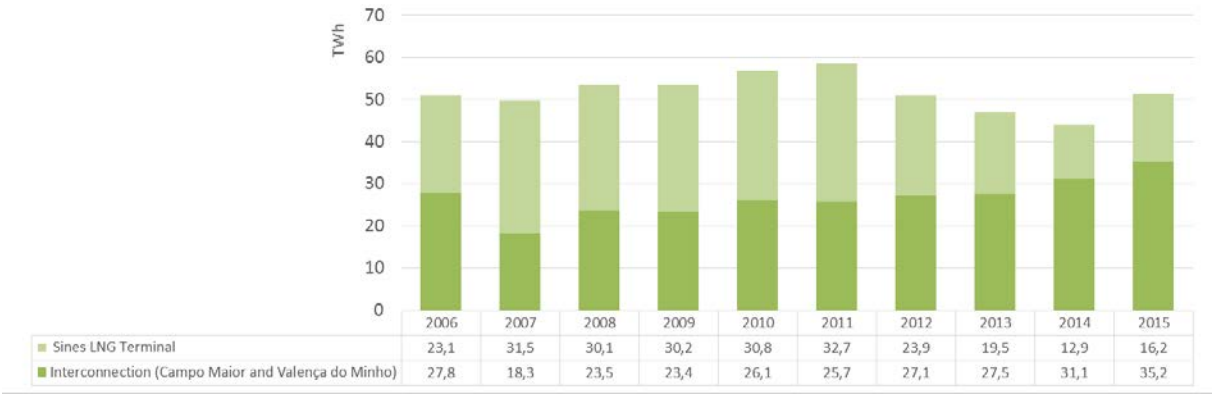
Related to imports, Figure 1-1 represents the geographic origin of natural gas in Portugal. Portugal has two large supply sources from Nigeria and Algeria which together contribute about 80% of the national gas consumption. Qatar and a combination of other sources account for the remainder.

Figure 1-1 - Geographical origin of natural gas in Portugal 2015 (bcm)



From the analysis of Figure 1-2, it can be seen that gas consumption in Portugal in 2015 has resumed the levels of consumption that occurred in 2012. The increase in gas consumption allows foreseeing the continuing importance of this energy source for the industrial sectors, which is a preponderant element in the market design and the characterization of demand.

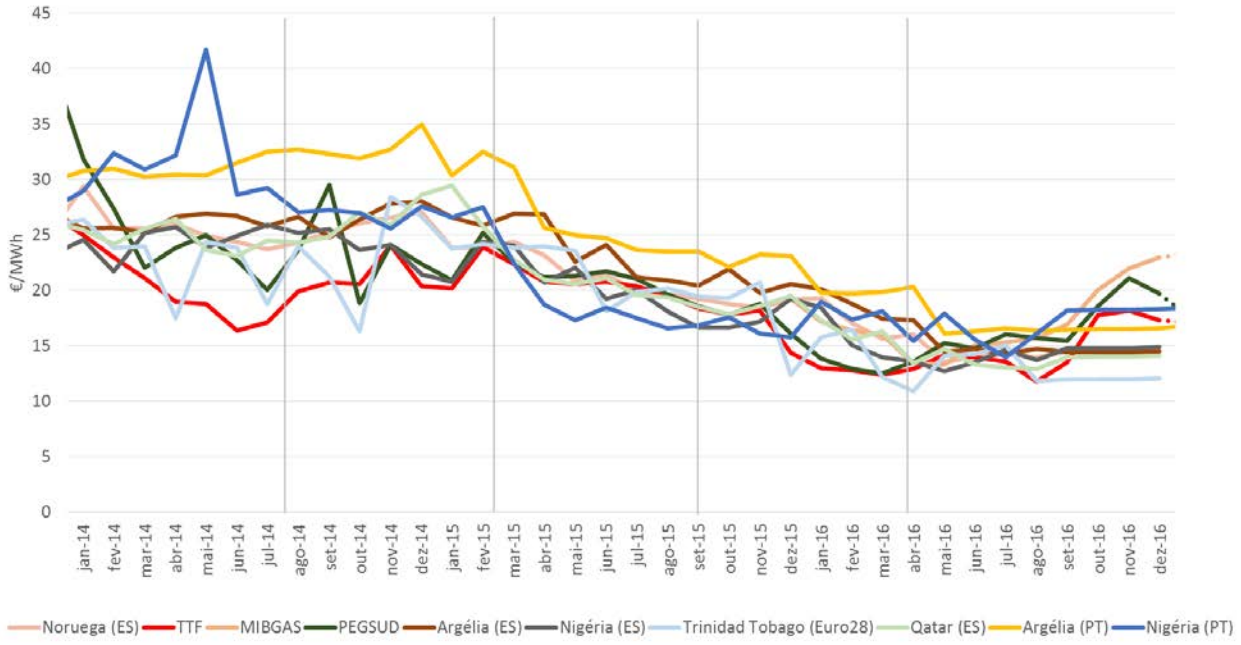
Figure 1-2 - Evolution of natural gas imports for Portugal



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Sines LNG Terminal	23,1	31,5	30,1	30,2	30,8	32,7	23,9	19,5	12,9	16,2
Interconnection (Campo Maior and Valença do Minho)	27,8	18,3	23,5	23,4	26,1	25,7	27,1	27,5	31,1	35,2

Figure 1-3 shows the evolution of natural gas prices for the two main supply sources, at the Portuguese border between 2006 to May 2016, in €/MWh. It presents the NG and LNG gas introduced either by pipeline, through Spain from Maghreb, or by the LNG terminal, respectively. The analysis of the graph shows that since 2014, the main operator's import prices follow the average prices of natural gas, verified in the Iberian market. This makes it possible to anticipate that the functioning of the natural gas market will not lead to large deviations in the Portuguese market, allowing new incumbents to enter the market, which may lead to lower prices.

Figure 1-3 - Evolution of natural gas import prices in Portugal (€/MWh), 2014-2016



The following table shows the monthly evolution of these prices from 2015 to May 2016 (in €/MWh).

Figure 1-4 - Natural gas import prices in Portugal

€/MWh	Natural gas (pipeline)	LNG	Average import price
jan 15	30,35	26,54	28,44
fev 15	32,50	27,50	30,00
mar 15	31,13	22,46	26,79
abr 15	25,61	18,71	22,16
mai 15	24,98	17,28	21,13
jun 15	24,73	18,42	21,57
jul 15	23,65	17,53	20,59
ago 15	23,53	16,55	20,04
set 15	23,49	16,87	20,18
out 15	22,08	17,55	19,81
nov 15	23,26	16,10	19,68
dez 15	23,09	15,77	19,43
jan 16	19,79	18,96	19,37
fev 16	19,69	17,39	18,54
mar 16	19,84	18,12	18,98
abr 16	20,29	15,45	17,87
mai 16	16,10	17,92	17,01
jun 16	16,34	15,55	15,94

In respect to the retail market[1], Figure 1-5 presents the consumption in energy and the number of non-household clients in Portugal. Although the band I0[2] is the most representative in number of clients, the bands I4[3] and I6[4] are the most important as regards energy consumption.

Figure 1-5 - Characterization of natural gas consumption by consumption bands of non-household customers

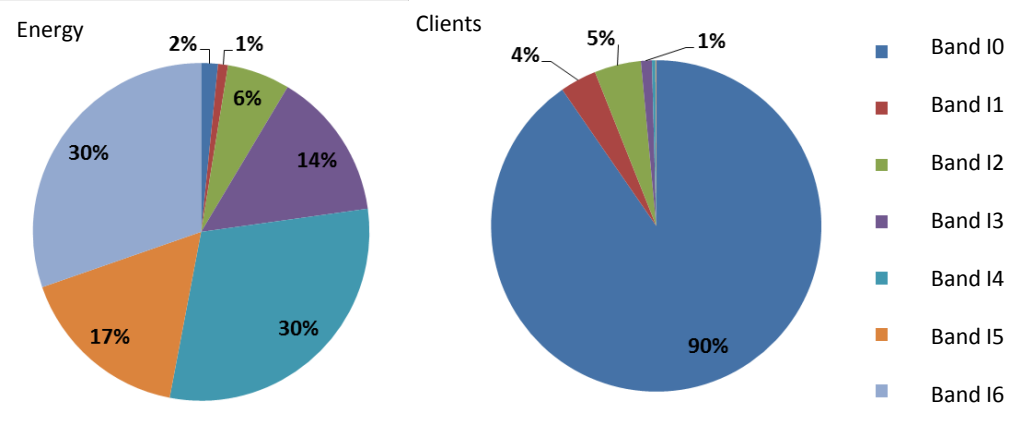


Figure 1-6 presents the consumption in energy and the number of household clients in Portugal. The band D1[5] is the most representative in Portugal, by number of clients and energy consumption.

1 The system of standard annual natural gas consumption bands are according European statistics on natural gas and electricity prices Regulation.

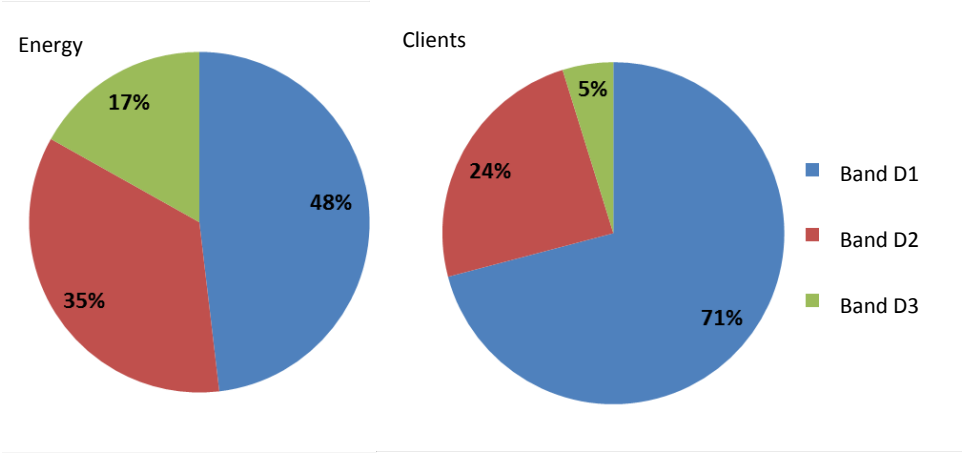
[2] Band I0 has an annual natural gas consumption < 420 (GJ).

[3] Band I4 has an annual natural gas consumption between ≥100 000 and <1 000 000 (GJ).

[4] Band I6 has an annual natural gas consumption ≥ 4 000 000 (GJ).

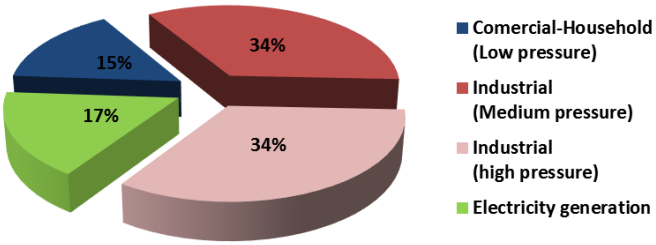
5 Band D1 has an annual natural gas consumption < 20 (GJ).

Figure 1-6 - Characterization of natural gas consumption by consumption bands of household customers



The consumption of natural gas, by sectors can be seen in Figure 1-7. The industrial sector linked to transmission (high pressure) and distribution networks (medium pressure) are the largest customers in the natural gas market. The development of the organized market will give these customers an incentive to seek better prices, contributing to market liquidity and increased competition between energy sources.

Figure 1-7 - Consumption of natural gas by sectors



The following figures present the number of retailers and the Herfindahl--Hirschman index levels for each of the most representative consumption bands in Portugal regarding industrial and domestic clients.

Figure 1-8 shows the number of suppliers for band I4 which has increased since 2nd trimester of 2015 with 6 suppliers in the retail market. The HHI computed by the demand share of the several suppliers is evolving in a favorable way, as shown in Figure 1-9.

Figure 1-8 - Evolution of retailers for band I4

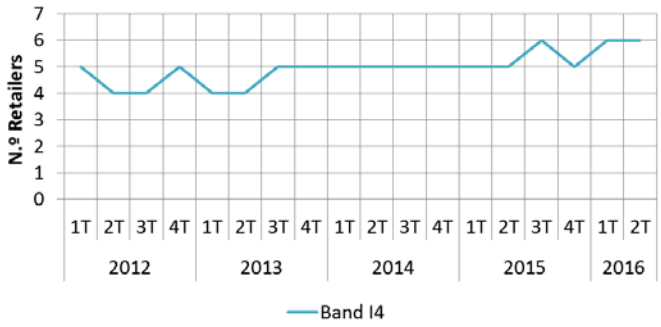


Figure 1-9 - Herfindahl índex evolution for band I4

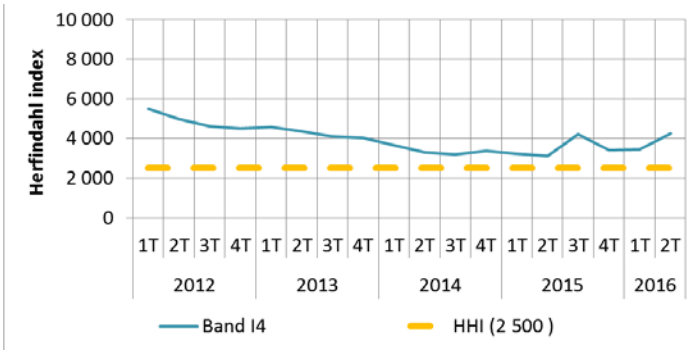


Figure 1-10 and Figure 1-11 show a remarkable evolution of HHI for household consumption band D1 between 2013 and 2016. These data show that despite the lack of an organized market in Portugal competition in the retail market is showing a favorable evolution.

Figure 1-10 - Evolution of retailers for band D1

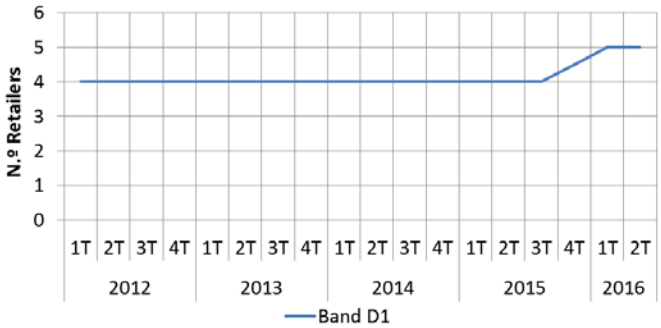
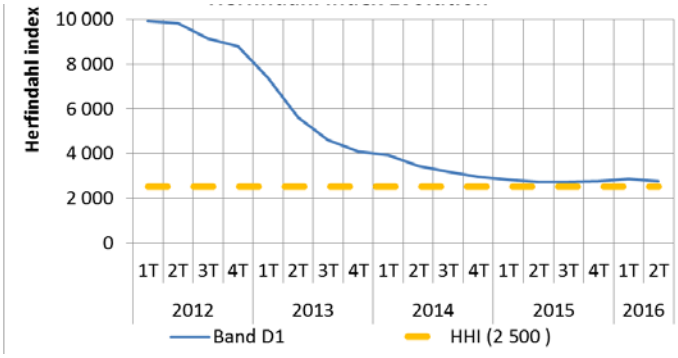


Figure 1-11 - Herfindahl índex evolution for band D1



As can be seen from the graphs above, the market in Portugal presents a diversification of relevant sources of supply, as well as HHI indexes in the order of 2000 in the segment of household consumers, which reveals the capacity of the market to adapt correctly to the existence of an organized market, despite the absence of an organized wholesale market.

1.2 IDENTIFICATION AND DESCRIPTION OF KEY DRIVERS TOWARDS IMPROVED WHOLESALE MARKET FUNCTIONING

The implementation of European Network Codes (NCs) is considered to be a crucial step towards the completion of the gas internal market. ERSE, in cooperation with other regulators, is working in a number of areas according to the priorities defined in the Work Plan for the South Gas Regional Initiative (SGRI)[6].

ERSE has already approved the CMP and CAM mechanisms and also BAL, fully implemented in October 2016.

1.2.1.1 CAPACITY ALLOCATION MECHANISMS

In the context of the early implementation of the CAM NC, auctions in the South Gas Regional Initiative (including France, Spain and Portugal) have allocated capacity for the first time at all interconnections between entry-exit systems in the whole region, via virtual interconnection points (VIPs) between Portugal, Spain and France. Capacity at these VIPs was allocated via PRISMA in 2014.

Annual, quarterly and monthly capacity products were offered to market agents through the PRISMA platform. The auction of the quarterly products was held in June 2014. The monthly auctions were held at

[6] More information about the Work Plan at http://www.acer.europa.eu/en/Gas/Regional_%20Intiatives/South_GRI/Public_Consultations/Documents/GRI%20WP%202015-2016%20Nov%202014_FINAL.pdf

the beginning of each month. The interconnections were virtually integrated into a single point (VIP), a situation that facilitated the functioning of the market.

In November 2015, the European network code for capacity allocation mechanisms for interconnections entered in force. On 1st November of 2015, provisions were adopted for the use of day-gas from 5 a.m. to 5 a.m. and allocation of daily and intraday capacity products according to the rules of the Network Code[7].

1.2.1.2 BALANCING NETWORK CODE

Portugal elected full implementation of the Code from 1 October 2016. Final approval of the relevant proposals were published in April of 2016 by Regulation of Infrastructure Operation[8] (Regulamento de Operação de Infraestruturas) which was complemented by Natural Gas Global Technical Management Procedures Manual[9] (Manual de Procedimentos de da Gestão Técnica Global de Gás Natural) published in October 2016.

1.2.1.3 CROSS-BORDER COOPERATION AND CMP HARMONIZATION IN THE SOUTH REGION

TSOs and NRAs have worked in a coordinated way on CMP harmonization in the South region. The rules for the implementation of the three mechanisms in force (over-subscription and buy-back OSBB, capacity surrender and long term use-it-or-lose-it) have been developed in a coordinated way, and approved by the French, Portuguese and Spanish regulators.

Regarding the adoption of a common OSBB methodology in the region, the three TSOs involved have proposed the OSBB detailed rules which were submitted to Public Consultation in September-October 2015[10]. The specifications of communication, timelines for the additional capacity offer, calculation of trigger values, buy back process, split of costs between TSOs for the buyback procedure as well as the use of PRISMA are defined in the scheme. After an evaluation of the responses received, a common methodology of OSBB was approved in April 2016. Full implementation is expected in April 2017.

[7] More information in ERSE website at http://www.erse.pt/pt/mibgas/capacidadeinterligacao/Documents/An%C3%BAncio%20Ano%20de%20Atribui%C3%A7%C3%A3o%20de%20capacidade%202015-2016.pdf.

[8] Available at ERSE webpage: https://dre.pt/application/file/74305613.

[9] Available at ERSE webpage: http://www.erse.pt/pt/gasnatural/regulamentos/operacaodasinfra-estruturas/Documents/Diretiva%2018_2016%20de%2027%20de%20outubro.pdf

[10] More information available at http://www.acer.europa.eu/en/Gas/Regional_%20Intiatives/South_GRI/Public_Consultations/CMP/20160428_OSBB_France_Portugal_Spain.pdf.

1.2.1.4 INTEROPERABILITY NETWORK CODE

In December 2015, ENTSOG approved the Interconnection Agreement Template, which covers the default terms and conditions for the minimum mandatory content of an interconnection agreement. TSOs of Spain, Portugal and France are working on their Interconnection Agreement, which was already submitted to public consultation in 2016. The agreement was expected to be finished by the end of 2016.

1.2.1.5 BEST PRACTICES - WHOLESALE MARKET ACCESSIBILITY

HARMONIZATION OF TARIFFS FOR ACCESS TO NATURAL GAS INTERCONNECTORS BETWEEN PORTUGAL AND SPAIN

In January 2012, ERSE and the CNE (now CNMC) held a joint Public Consultation on the harmonization of tariffs for access to natural gas interconnections between Portugal and Spain[11]. A price differential of around 3 € / MWh was observed, for a trader that supplies the market of one of the countries with gas injected in the adjacent country, using the interconnection. This price differential represented about 10% of the natural gas wholesale price for a gas-fired combined cycle plant in Spain at the time.

Since 2012, Portugal has eliminated exit prices on the transmission network for nominations in contraflow. These contraflow situations are observed at the point of exit from the transmission network to the Sines terminal as well as in the interconnection from Portugal to Spain.

These measures contribute to provide more flexibility to market players by facilitating capacity nominations, on a virtual and zero cost basis, to place gas in the terminal and make access to LNG storage available from the transmission network.

At the end of 2012, new interconnection tariffs between Spain and Portugal were approved. In Spain, through Order IET / 2812/2012, on 27 December, the variable term of the driving tariff in the amount of € 0.42 / MWh applicable to the exit from the transmission network in Spain to Portugal was cancelled. This decision has reduced payments by the use of the interconnection of Spain to Portugal by about 20%.

IMPLEMENTATION OF A FULLY DECOUPLED ENTRY-EXIT SYSTEM

In April of 2013[12], the Portuguese Tariff Regulation Code approved an Entry-Exit Tariff System full aligned with what was established in FG Tariffs and CAM Network Code. This tariff system is applied and extended to all high pressure infrastructure in order to ensure tariff interoperability of all high pressure natural gas

[11] More information available at http://www.erse.pt/pt/consultaspublicas/historico/Paginas/39.aspx.

[12] More information at http://www.erse.pt/pt/gasnatural/regulamentos/tarifario/Documents/Regulamento%20139-E-2013_RT%20GN.pdf.

infrastructures (Terminal, underground storage and interconnections), facilitating the purchase of capacity by market integration and promoting market integration with Spain.

REDUCTION OF ENTRY BARRIERS TO NEW MARKET AGENTS

In order to reduce barriers to entry for new agents, the following measures have been adopted:

a) Since 2012 Sines LNG Terminal has available a third gas storage tank which allows the loading of 3 boats sequentially and has expanded the total capacity of the natural gas system;

b) Since 2013, the price of LNG storage is aligned with the marginal cost in order to facilitate the entry of new suppliers into the market;

c) Approval of multipliers applied for short term capacity products of all the high pressure infrastructure (LNG terminal, underground storage and entry/exit transmission tariffs): 1,3 for quarterly products; 1,5 monthly and 2 for daily products.

1.3 STEPS TO IMPROVE "MARKET HEALTH" NEEDS METRICS

The main step to improve market conditions is the implementation and start of the Iberian gas market (Mibgas) through the implicit allocation of capacity. In the following points, the main steps to achieve this goal are described.

1.3.1 EXPECTED STATE OF WHOLESALE MARKET FUNCTIONING IN 2017

The main regulatory goal to achieve GTM targets (or at least get closer to these targets) is the development of a liquid gas exchange for Portugal and Spain, which is foreseen to start in 2017, regarding the Portuguese market. The main steps taken since 2015 to implement the gas exchange are described below.

1.3.2 PUBLIC CONSULTATION

During June and July 2014, CNMC and ERSE held a public consultation on *Study about models for integration of the Spanish and Portuguese gas markets in a common Iberian Natural Gas Market*. The draft study posed questions to stakeholders, in order to provide input on the study.

In the Public Consultation document, 3 basic models were presented, namely:

- Market area model: This model consists of the integration of transmission networks into a single input and output system. This model can be implemented in a single Member State or between neighboring Member States. In this model, the virtual point is the main point of wholesale of natural gas.

- The regional market (The Trading Region Model): In this model also the natural gas transmission networks are integrated in a single input and output system, but the main difference with the previous model is the coexistence of two balance areas. In this context, this model requires a lower level of legislative harmonization than the previous one, allowing the continuation of two entities for the balance sheet operations, one for each national network.
- Integrated market with implicit allocation of capacity (Gas Market integration with implicit allocation of capacity). This model is focused on the development of a common organized market, allowing the simultaneous allocation of interconnection and natural gas capacity between two balance areas.

This implicit allocation mechanism allows allocation of capacity in the interconnections based on bids and offers of buying and selling of gas, through a gas exchange, operating on both sides of the border. In this way, the allocation of capacity and the purchase and sale of gas will follow market signals. In this model, the market operator will have to match the gas purchase and sale proposals independently of the area, automatically allocating the capacity of the interconnection in the operation that corresponds to the best offer.

As a result of the public consultation, 23 responses were received. In March 2015, an Evaluation of responses was published which summarized the views expressed by the respondents of the public consultation[13].

In the public consultation, CNMC and ERSE were seeking comments from stakeholders on the way forward with the goal of setting up a common Iberian Natural Gas Market. The questions posed were as follows:

Question 1: Would you agree with the analysis made on current market situation and on the major issues affecting the creation of an Iberian market?

Question 2: Do you agree with the implementation of the wholesale market with implicit allocation of capacity as a step for market integration, but aiming for an even more integrated market in the longer term?

Question 3: What are the most important aspects to take into account and to harmonize from a regulatory point of view for the creation of the wholesale market with implicit allocation?

Question 4: Which is the best model for the integration of Iberia in the longer term? Market area model, trading region or others?

Question 5: When and how should the Balancing Network Code and the Interoperability Network Code be implemented to contribute to the goal of the Iberian market?

[13] All the information regarding this public consultation is available at ERSE webpage http://www.erse.pt/pt/consultaspublicas/historico/Paginas/47_C.aspx.

Question 6: Identify any issue you think is important to achieve further integration. How would you set the timing and prioritization for the discussion/implementation on these issues?

As a result of the evaluation of comments received, the general comments highlighted were the following:

- Nearly all respondents agree that market integration is positive for both countries since Portugal does not fulfil the minimum requirements in terms of size, sources and market players to implement a national organized market on its own and the Spanish market will improve in terms of market liquidity with the integration with the Portuguese market.
- All respondents consider important to highlight that the regulatory harmonization between both countries should aim at guaranteeing that the same best practices are applied; therefore a stronger coordination between Enagas and REN is required from the beginning.
- Naturally, this harmonization has to be developed in accordance with the medium-long term objective of a Common Energy Market, so the European Directives and Regulations – notably the CAM, CMP, Tariffs, Balancing and Interoperability - must be considered whenever they are approved.
- A common remark made is to assure that European network codes already in implementation phase or scheduled to be implemented in the near future, such as Balancing CMP, tariffs and Interoperability NC, should be implemented in a coordinated manner in both countries.
- The best model is a trade-off between the degree of integration, the timing to achieve the goal and the cost of implementation.

As a result of this public consultation, and as defined in the Regional Plan of SGRI, Portugal and Spain agreed on the implementation of an implicit capacity allocation model, which is expected to start operating in 2017.

The realization of MIBGAS contributes to (and it at least mitigates, if not exceeds) some of the structural conditions of operation of the natural gas market in Portugal. Examples include the work on harmonizing the rules governing the functioning of national markets in the Iberian Peninsula and the creation of an Iberian hub for the negotiation of natural gas. The MIBGAS negotiation and development framework is a window of opportunity for the creation of an Iberian price reference mechanism, which promotes gas trading in the Iberian context and constitutes a mechanism to improve transparency in the formation of the price of natural gas to the Iberian market. Likewise, issues such as market concentration and dependence on sources of supply are mitigated by the increase in market integration, which also contributes to reducing the expression of the problem of indivisibilities resulting from LNG shipping. In addition, the development of the regional market in the South (Portugal, Spain and France) allows us to initiate European convergence in the construction of the internal energy market and to place the options in MIBGAS in the more global context of the European energy policy objectives.

2 POTENCIAL STRUCTURAL MARKET REFORMS

The main market reform currently in process to improve wholesale gas market functioning is the development of a wholesale market in Portugal integrated through an implicit capacity allocation mechanism with the wholesale Spanish market, as described in section 1.3.

2.1 WHOLESALE MARKET INTEGRATION – BETWEEN SPANISH AND PORTUGAL

The MIBGAS exchange platform has been nominated by Portugal as its market platform[14]. In 2017, trading of Portuguese products on the platform is planned to begin, thus improving the functioning on both markets (Spanish and Portuguese).

In order to promote the liquidity on both virtual points, ERSE and CNMC are also working on the implementation of a mechanism of market coupling with implicit allocation of capacity in order to reach further Iberian gas market integration.

Considering the public consultations and the joint working groups from NRAs and TSOs from Portugal and Spain it was decided to put aside some capacity from the bundled firm interconnection capacity offered at VIP IBERICO via PRISMA, in order for it to be allocated implicitly according to users' trades in MIBGAS. The implicit allocation mechanism will include day-ahead and within-day capacity products, and also monthly products.

The capacity quantities which are being discussed to be put aside for the implicit allocation and the procedure to develop, are as follows:

- A maximum amount of 9 GWh/day of firm bundled interconnection capacity at VIP IBERICO, in both directions, are reserved to be allocated implicitly via MIBGAS, and therefore they will be put aside from the interconnection capacity offered at PRISMA auctions as annual, quarterly, monthly, day-ahead and within-day products.
- 3 GWh/day of the reserved interconnection capacity will be implicitly allocated as monthly products at MIBGAS. The capacity not allocated in this procedure will go back to PRISMA. The non-allocated capacity will be offered as day-ahead products in PRISMA capacity auctions.1
- 3 GWh/day of the reserved interconnection capacity will be implicitly allocated as day-ahead products at MIBGAS. The capacity not allocated in this procedure will be included in the implicit capacity to be offered as within-day products at MIBGAS.

[14] In accordance to Portaria n.º 643/2015, of 21st August available at http://www.erse.pt/pt/legislacao/Legislacao/Attachments/1915/2015%20Portaria%20643_2015%20Cria%20o%20MIBGAS%20(limites%20de%20participacoes).pdf.

- 3 GWh/day of the reserved interconnection capacity, at least, will be implicitly allocated as within-day products at MIBGAS. This quantity will be increased by the day-ahead capacity offered implicitly at MIBGAS and not allocated.
- These quantities are for the first stages of the market coupling process. After assessing market performance, CNMC and ERSE could revise and modify the previous quantities after consultation of interested parties.

In this model, the Market Operator would match bids together independently of the area, so a bid to buy gas on one side of the border (i.e. Spain) can be matched with a bid to sell gas on the other side (i.e. Portugal). The Market Operator would then allocate cross-border capacity which would enable the maximum increase in welfare. This proposal[15] has been circulated to Iberian stakeholders for comments.

The foreseen roadmap for the implementation of this implicit allocation model is:

- Update of Spanish CAM Circular to foreseen the implicit allocation model – January 2017
- Update of Portuguese Procedures Access Infrastructures Manual[16] (MPAI) – January 2017
- Virtual Trade Point for ES&PT implicit allocation mechanism solution ("manual" procedures) – 1st Quarter of 2017
- VTP ES&PT implicit allocation mechanism solution (IT procedures) - 1 July 2017

[15] Available at http://www.acer.europa.eu/Events/40th-IG-Meeting/Documents/Implicit%20capacity%20allocation%20at%20VIP%20IBERICO%20after%20comments.pdf

[16] The actual "Procedures Access Infrastructures Manual" is dated of 2014, and is available at http://www.erse.pt/pt/gasnatural/regulamentos/acessoasredesinfraestruturaseasinterligacoes/Documents/Diretiva%2014.2014%20MPAI.pdf.