REPORT OF THE HELLENIC GAS TRANSMISSION SYSTEM OPERATOR (DESFA S.A.)

ON THE IMPLEMENTATION OF INTERIM MEASURES

UNDER REGULATION (EU) 312/2014 "ESTABLISHING A NETWORK CODE

ON GAS BALANCING OF TRANSMISSION NETWORKS"

March 2015

1. Introduction

In April 2014 the Regulation (EU) No. 312/2014 of 26 March 2014, for establishing a network code on gas balancing of transmission networks (hereinafter "Regulation") came into force.

The Regulation includes, among other things, rules and measures related to the operational balancing of the Transmission System, the daily nominations of Transmission Users, the daily imbalance charges and the provision of information to and from the Transmission System Operator (TSO).

Although the Regulation is the basis of business rules for balancing, several provisions are also related to Regulation (EU) No. 984/2013 for Capacity Allocation Mechanisms in Interconnection Points and to Regulation for Interoperability in Interconnection Points which is under conformation.

The objective of the Regulation is to establish rules and measures which contribute to the promotion of a competitive and effective short-term gas market.

The Regulation, in its full implementation, establishes the basic principles for the creation and development of a balancing scheme for the Transmission System, based on natural gas (NG) market rules. Transmission Users participate actively on a daily basis, balancing their

portfolios by buying and selling short-term standardized products in marginal prices, set by the trading of products taking place in a Virtual Trading Point.

A prerequisite for its implementation is the existence of adequate liquidity of short-term wholesale gas market.

According to Article 45 of the Regulation, "In the absence of sufficient liquidity of the short term wholesale gas market, suitable interim measures referred to in Articles 47 to 50 shall be implemented by the transmission system operators".

The Regulation, according to Articles 45 and 46, provides that the TSO may implement interim measures, to that end DESFA submits this Report on interim measures, in order to be approved by RAE.

The submitted Report includes a description and overview of the current situation of the natural gas market in Greece, the proposed interim measures and the reasons for applying them as well as the incentives and actions to be undertaken by DESFA, in the direction of suspension of the measures.

2. Overview of the Greek natural gas market.

Through the National Natural Gas Transmission System (NNGTS) natural gas is transmitted to consumers in the Greek mainland, from the following entrances:

- Pipe gas, through the Border Metering Station (BMS) Sidirokastro Serres (Entry Point "Sidirokastro" - upstream Operator BULGARTRANSGAZ), in the Greek-Bulgarian border.
- Pipe gas, through the Border Metering Station Kipi Evros (Entry Point "Kipi" - upstream Operator BOTAS), in the Greek-Turkish border.
- Regasified Liquefied Natural Gas (LNG), through the Agia Triada Metering Station (Entry Point "Agia Triada"), from the LNG terminal, which is located on the island of Revithoussa in Megara Gulf.

NNGTS consists of:

- the main gas pipeline and its HP branches,
- the Border Metering Stations at Sidirokastro (Serres) and at Kipi (Evros),
- the LNG Terminal Station in Revythoussa, and the entry point of regasified LNG to the Transmission System in Agia Triada
- the Compression Station in New Messimvria Thessaloniki
- the Metering and Regulating Stations,

- Valve stations and scrapper stations of the main pipeline and its HP branches,
- Control centers and dispatching centers (main and backup)
- the Operation and Maintenance Centers at Sidirokastro, Eastern Greece, Northern Greece, Central Greece and Southern Greece, and
- the supervisory control and data acquisition (SCADA) system.

Data presented below reflect the evolution of the NG market for the period 2010-2014. Following the entry into force of the Gas Network Code (hereinafter "the Code") of NNGTS in 2010, the principles for the effective opening of the NG market and for the development of a secondary Technical Capacity (TC) market have been implemented.

For the period 1996-2009 the only supplier of NNGTS and therefore of the NG consumers, was the DEPA S.A.

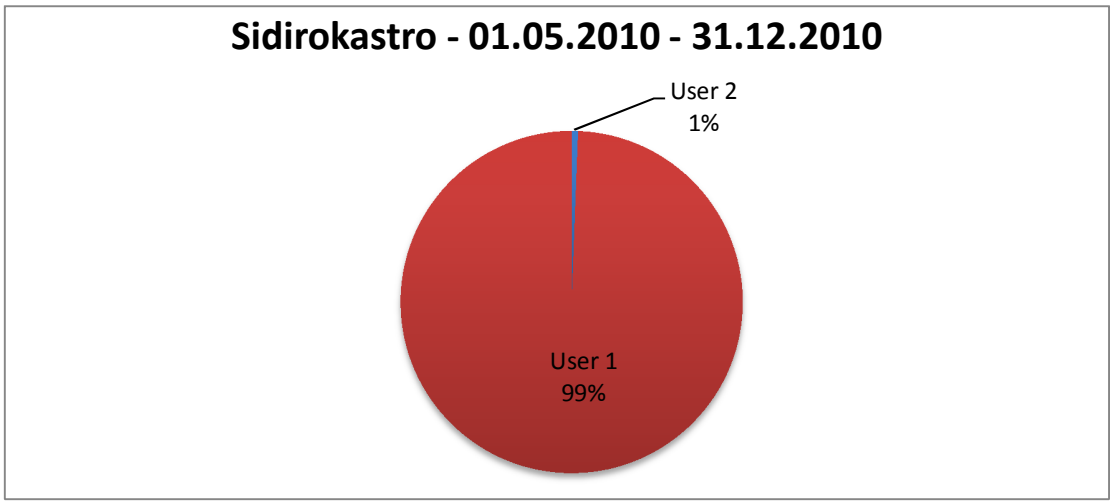
Emphasis is given on the number of Users that are active in the NG market, the mapping of the characteristics of existing supply sources of the Transmission System, and hence to the estimation of the flexibility of a short term wholesale NG market based on the current market characteristics.

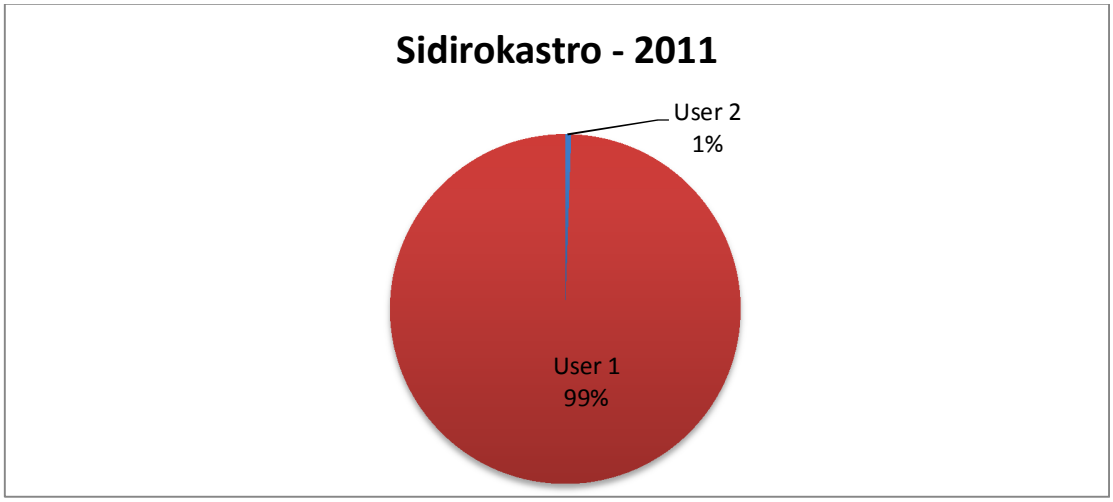
Table 1 below, presents data related to the total number of Users that are registered in RAE registry and the number of active Users for the period 2010-2014.

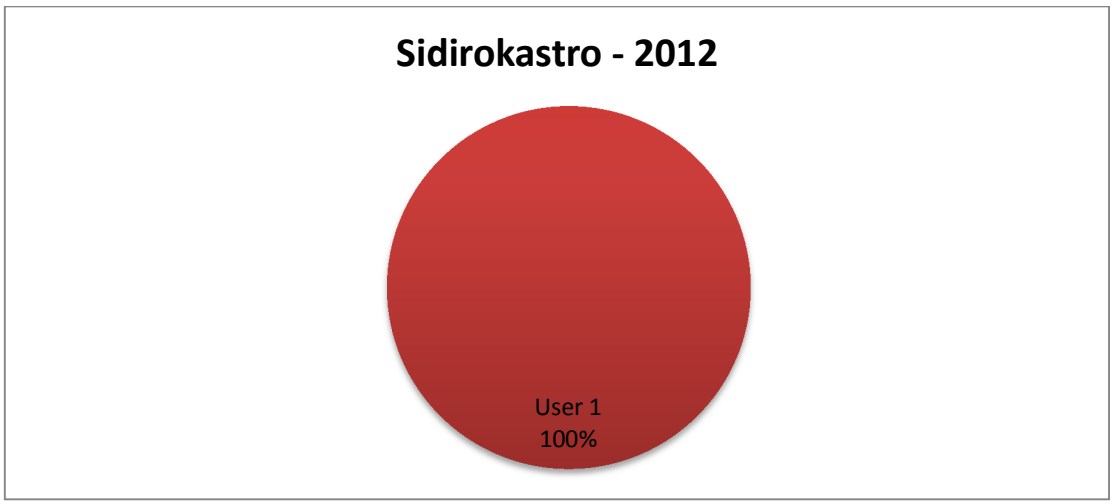
	2010	**2011**	**2012**	**2013**	**2014**
NNGTS Users	11	18	21	26	35
Active Transmission Users	4	5	6	5	5
Active LNG Users	3	5	3	3	3

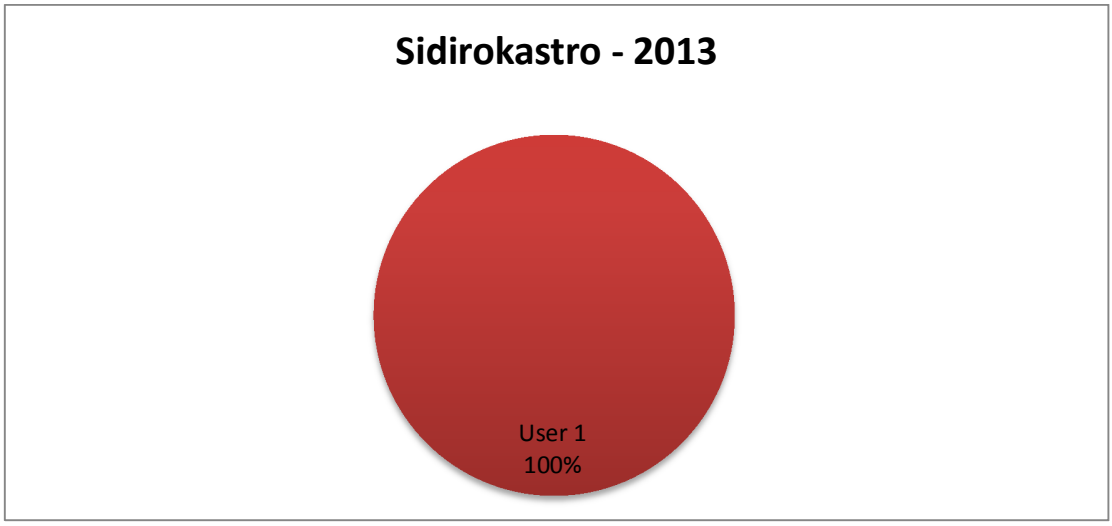
In the next, information is presented regarding the booking of TC for Delivery at Entry Points of the Transmission System and for the unloading of LNG ships, per User for the period 2010-2014.

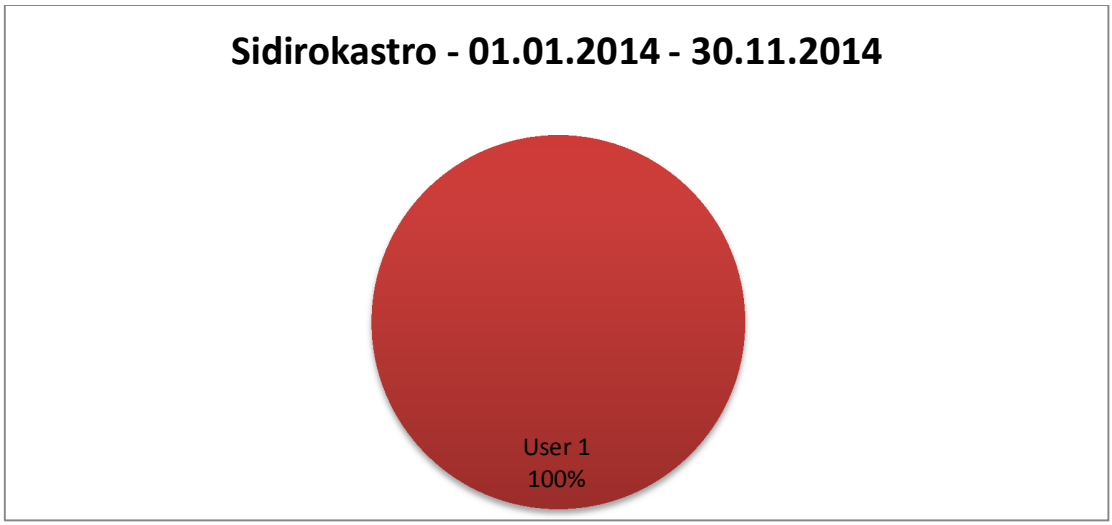
The following charts present the booking percentage of the TC for Delivery per Transmission User at the Entry Point Sidirokastro.



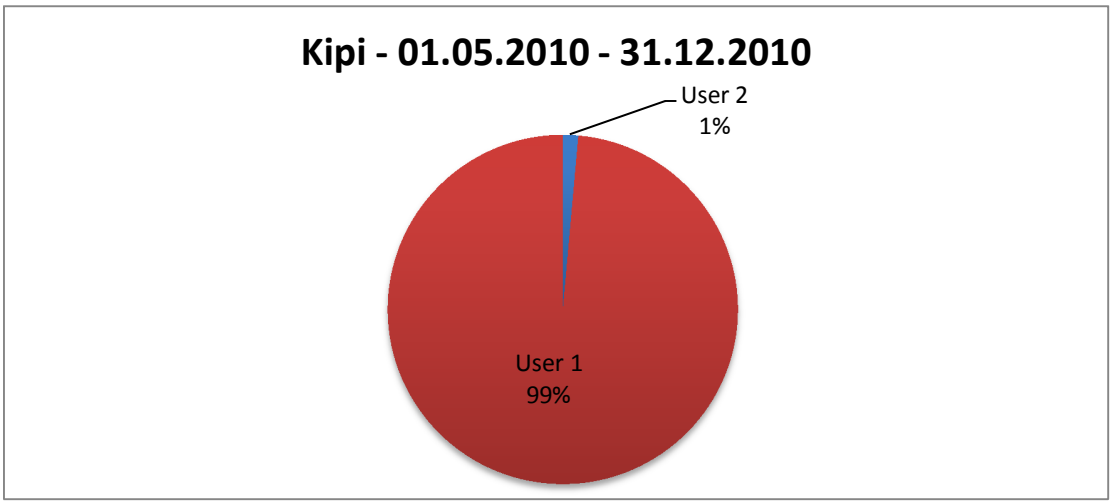


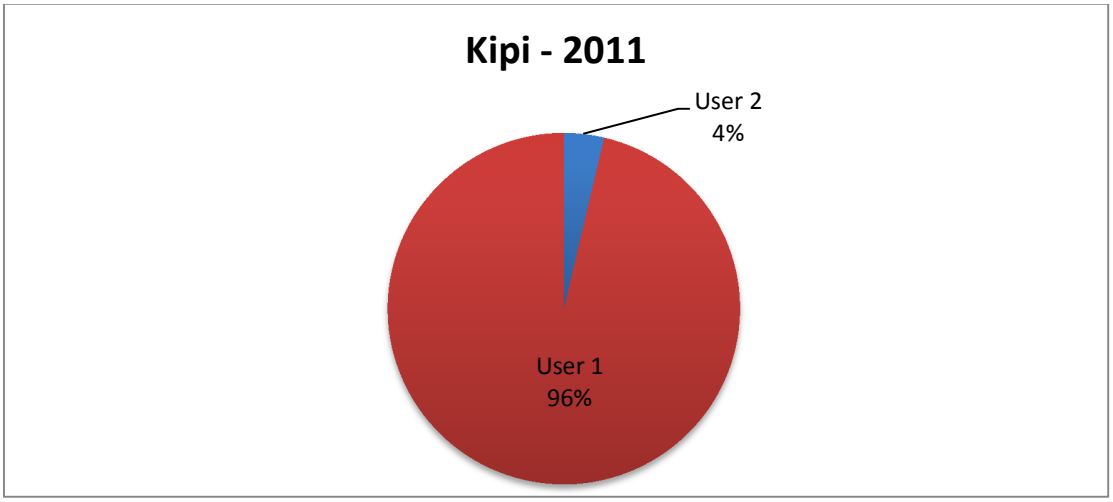


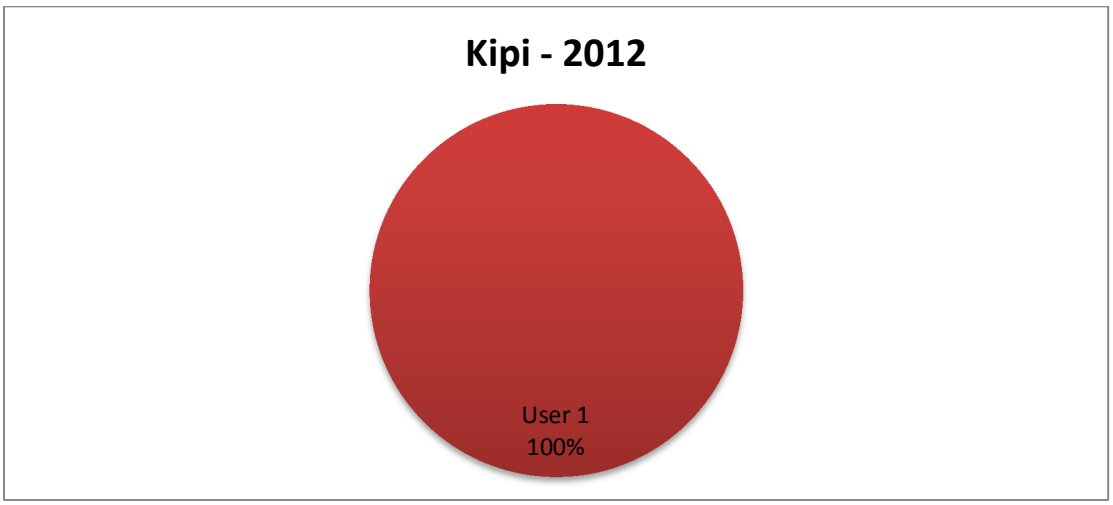

Sidirokastro - 2013
User 1
100%

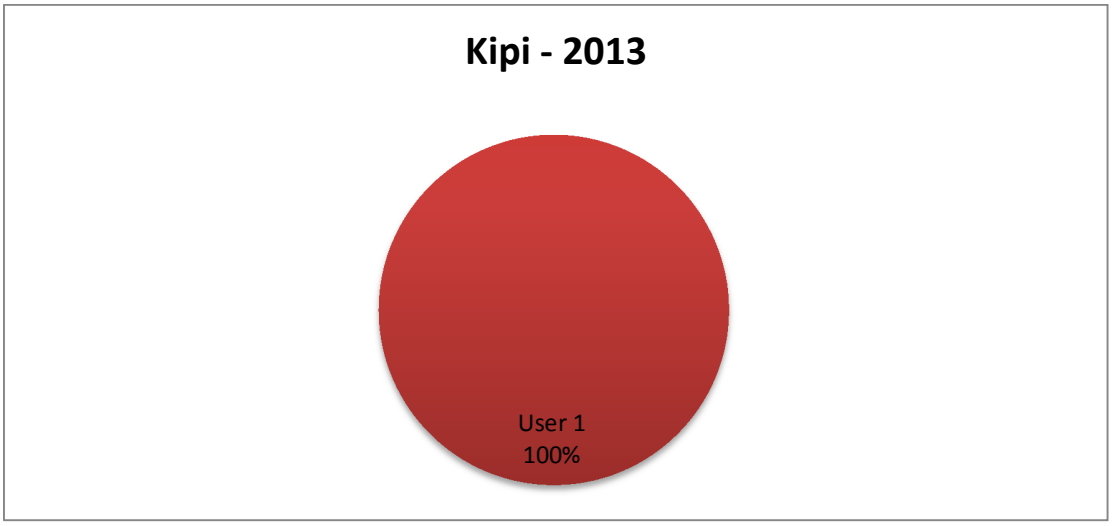

Sidirokastro - 01.01.2014 - 30.11.2014
User 1
100%

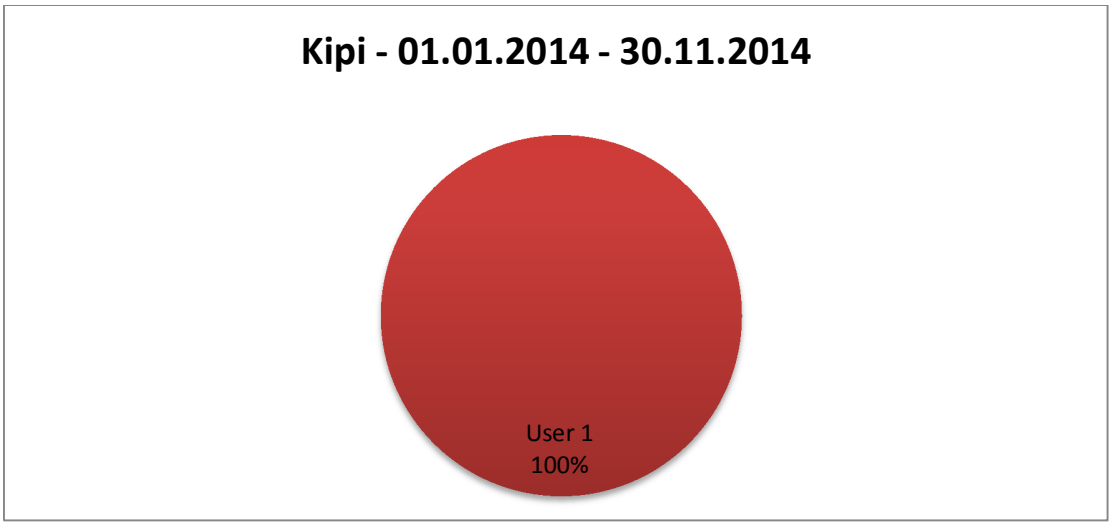
The following charts present the booking percentage of the TC for Delivery per Transmission User at the Entry Point Kipi



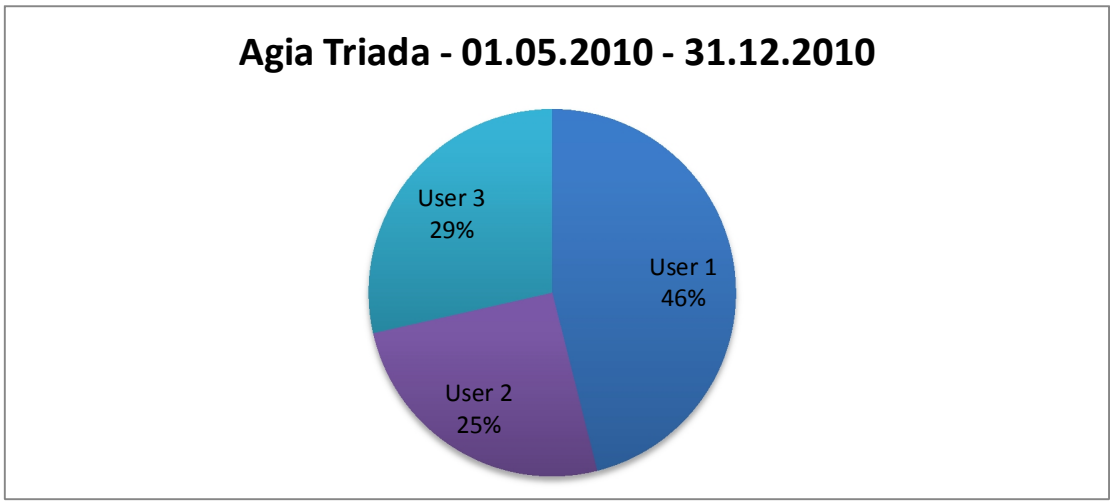


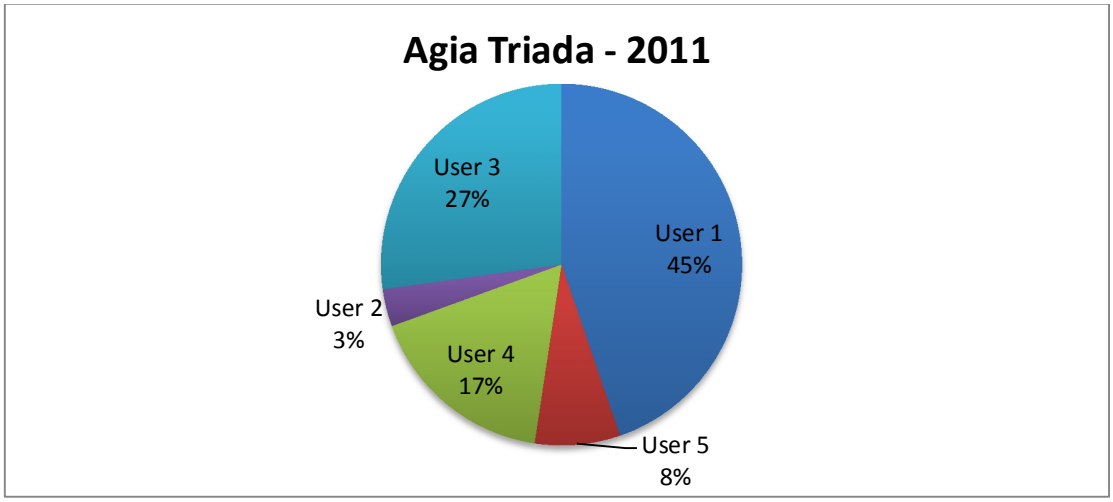


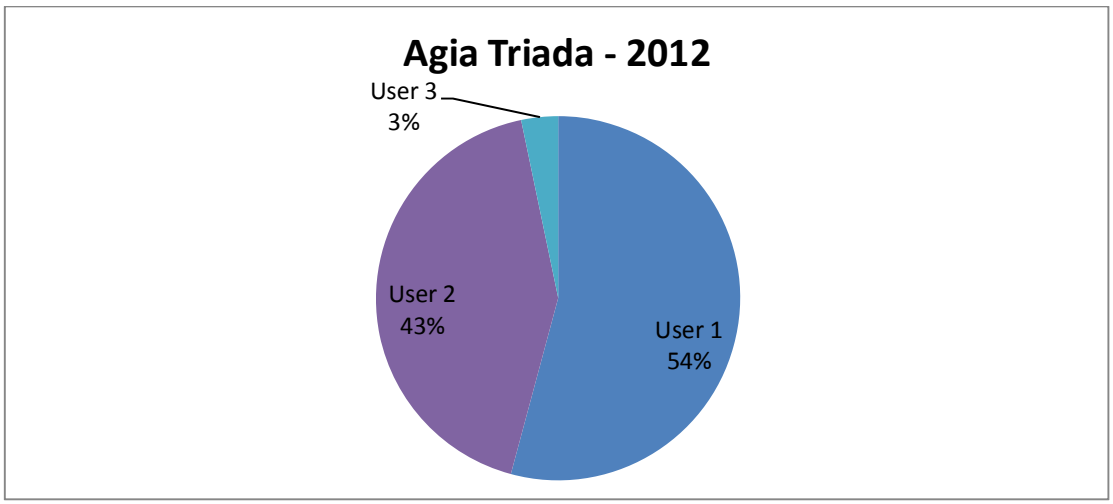

Kipi - 2013
User 1
100%

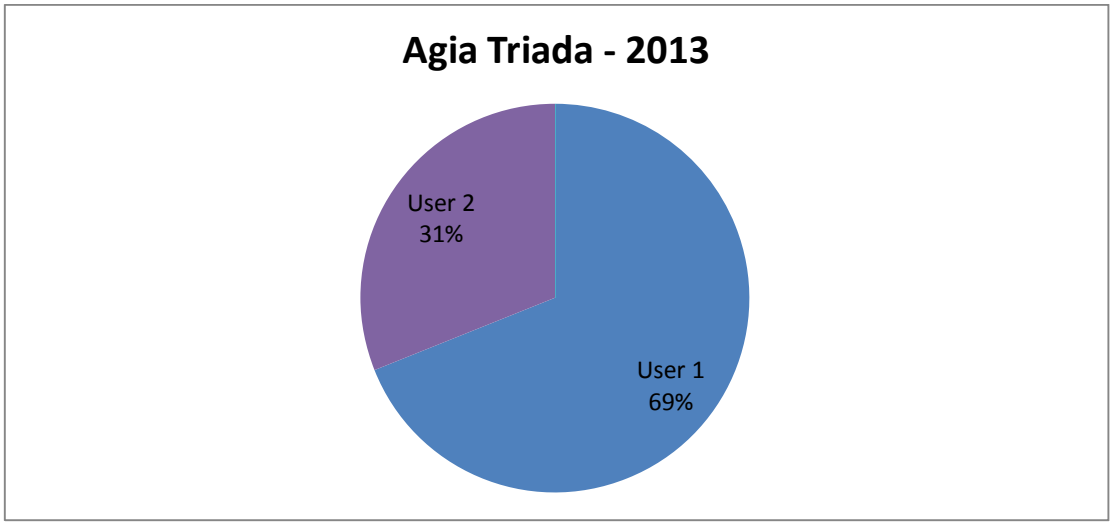

Kipi - 01.01.2014 - 30.11.2014
User 1
100%

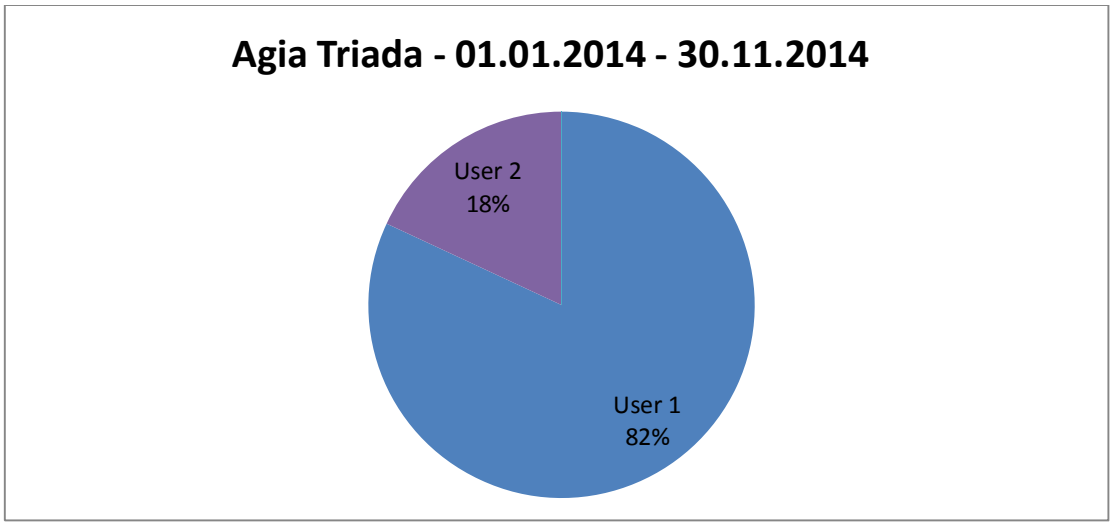
The following charts present the booking percentage of the TC for Delivery per Transmission User at the Entry Point Agia Triada.







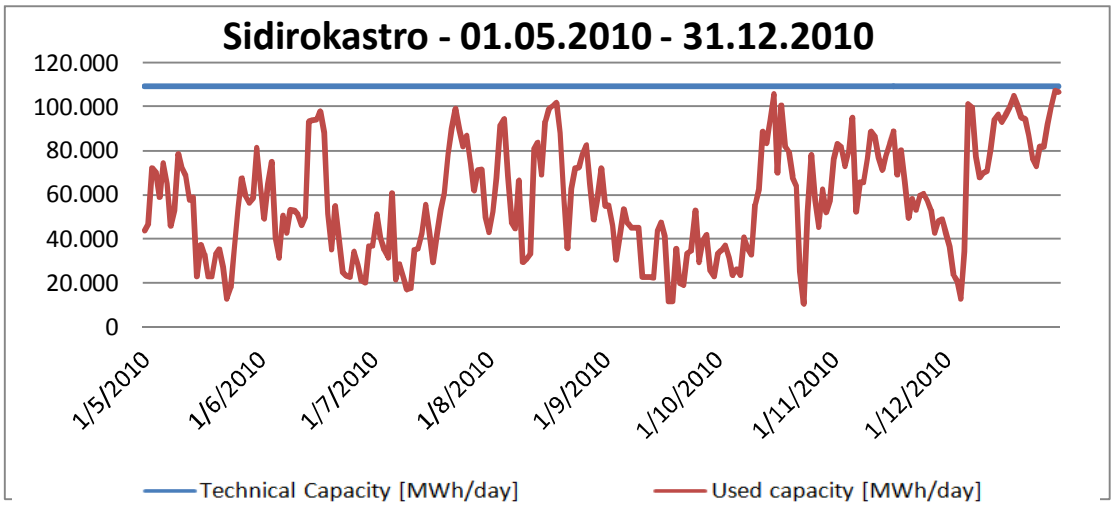


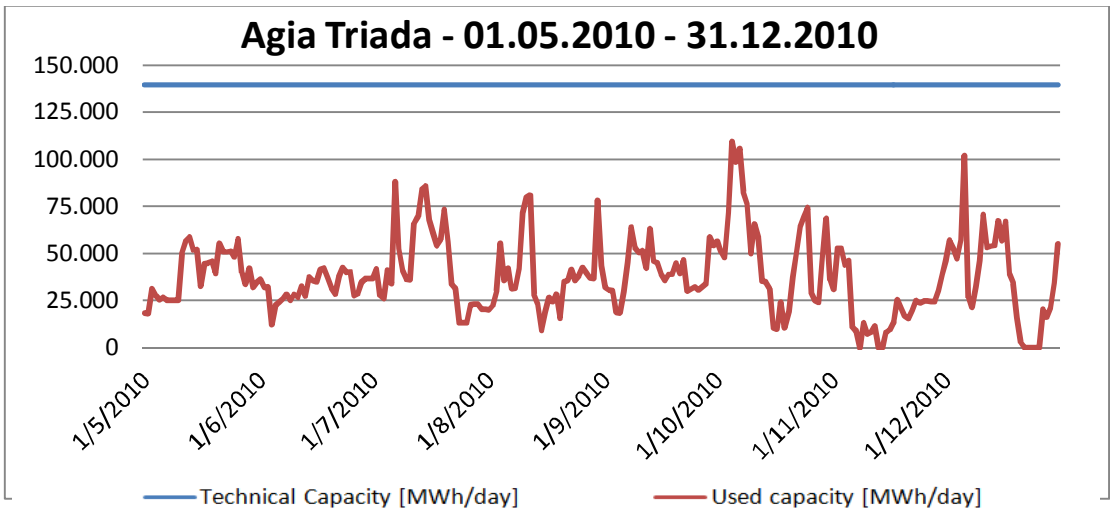


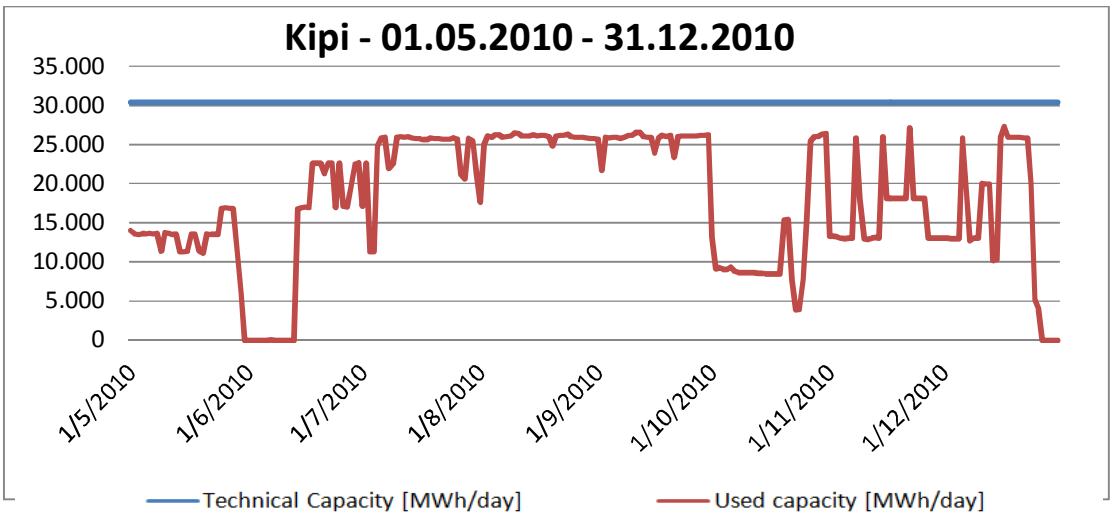
The table below presents data for the LNG ships unloading (LNG m^3) for the period 2010-2014.

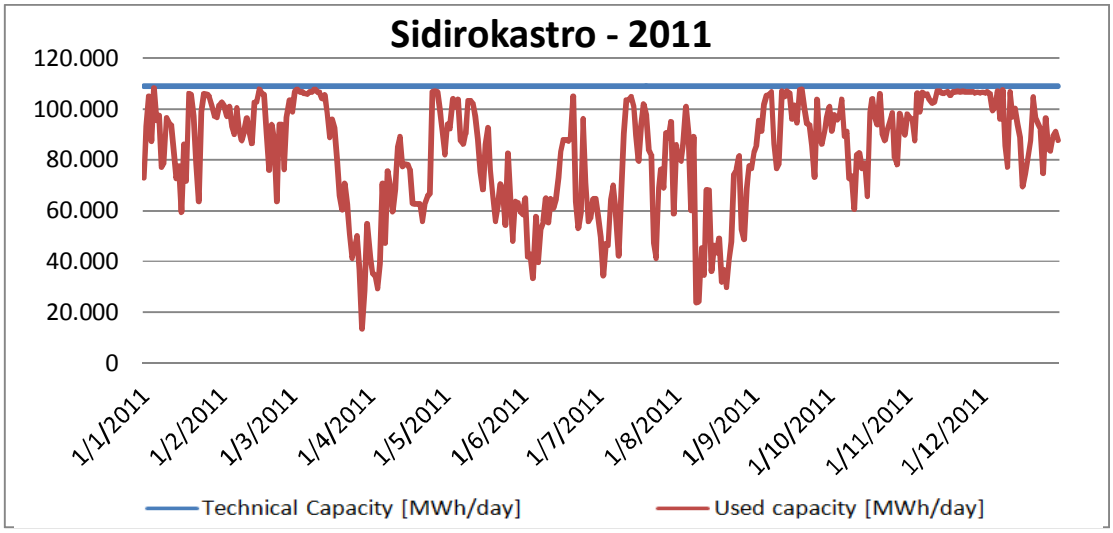
LNG ships unloading (LNG in m^3)	2010 (01.05.2010-31.12.2010)	2011	2012	2013	2014 (01.01.2014-30.11.2014)
User 1	1.208.705	1.207.788	1.545.796	1.004.154	744.859
User 2	339.000	278.645	631.557	18.013	167.874
User 3	340.589	262.031			
User 4		114.025			
User 5		123.317			

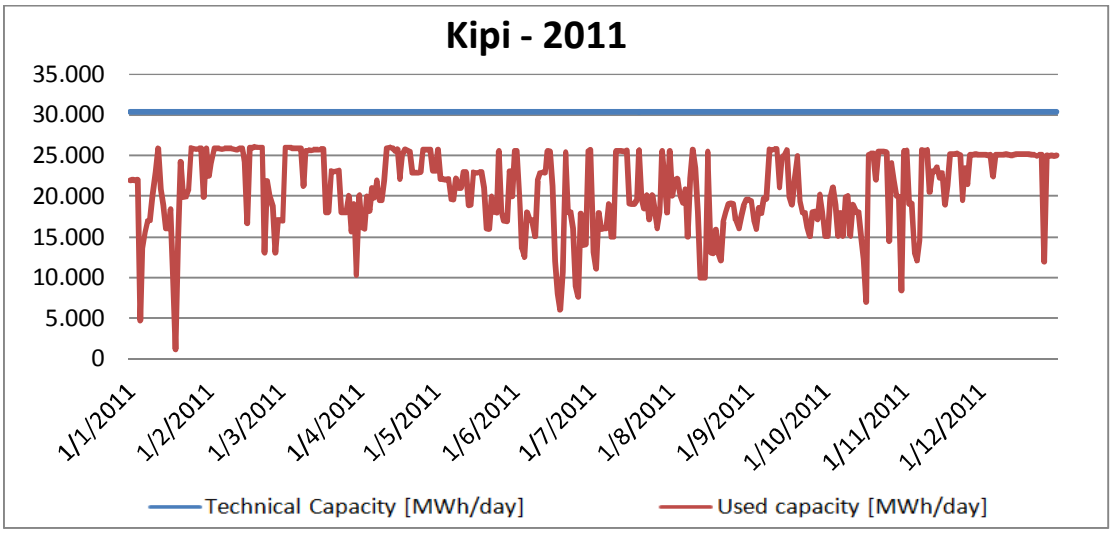
The annual use of existing NNGTS entry points for the years 2010-2014, in terms of TC for Delivery, is shown below:

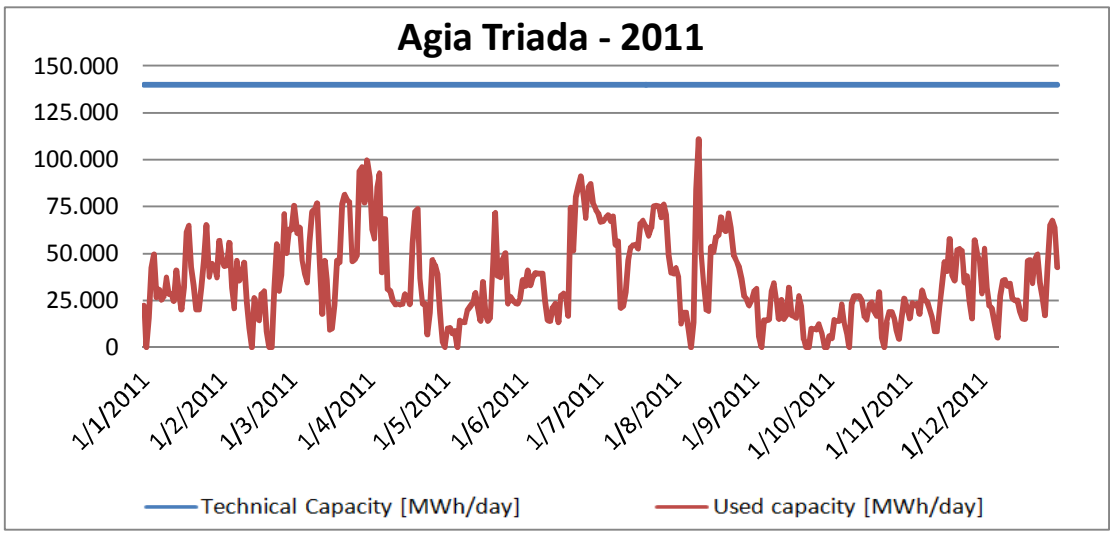


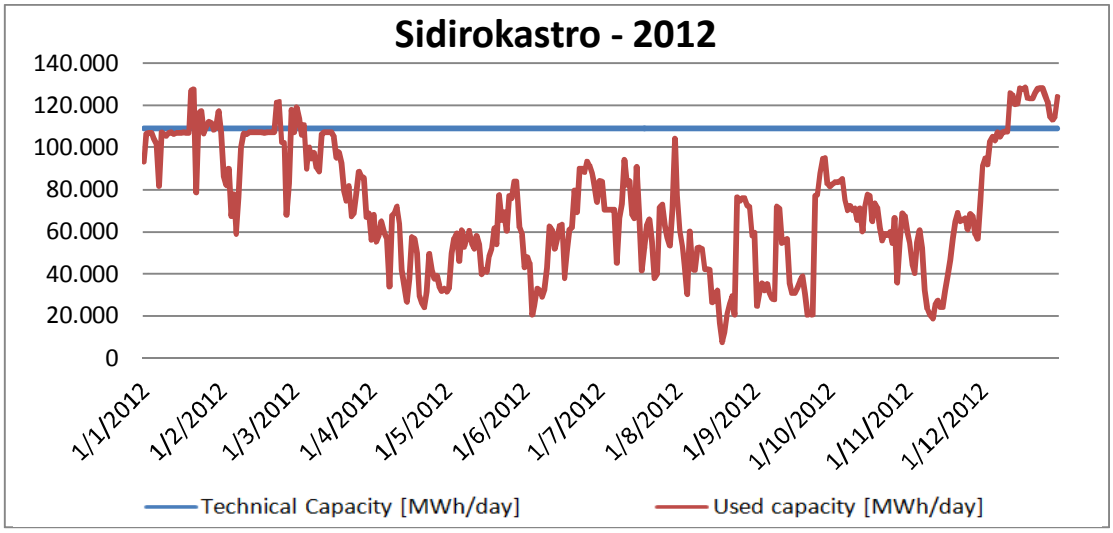


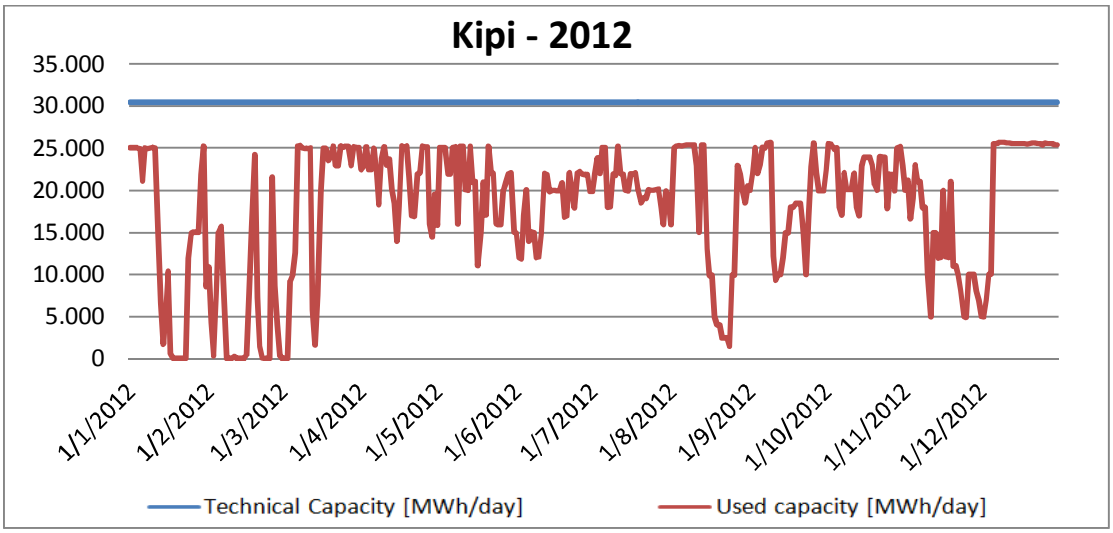


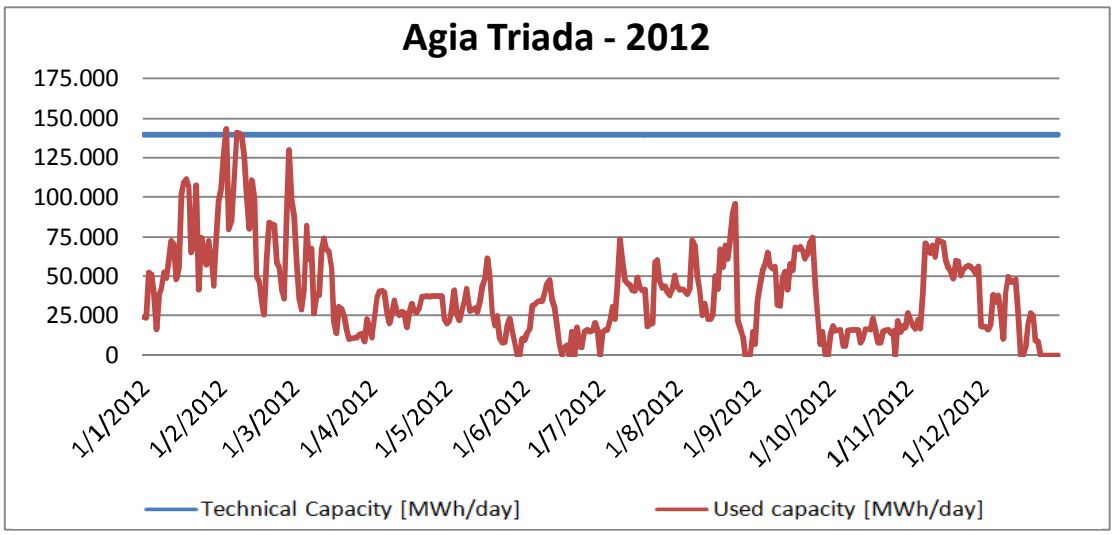

Sidirokastro - 2011
120.000
100.000
80.000
60.000
40.000
20.000
0
1/1/2011
1/2/2011
1/3/2011
1/4/2011
1/5/2011
1/6/2011
1/7/2011
1/8/2011
1/9/2011
1/10/2011
1/11/2011
1/12/2011
Technical Capacity [MWh/day]
Used capacity [MWh/day]

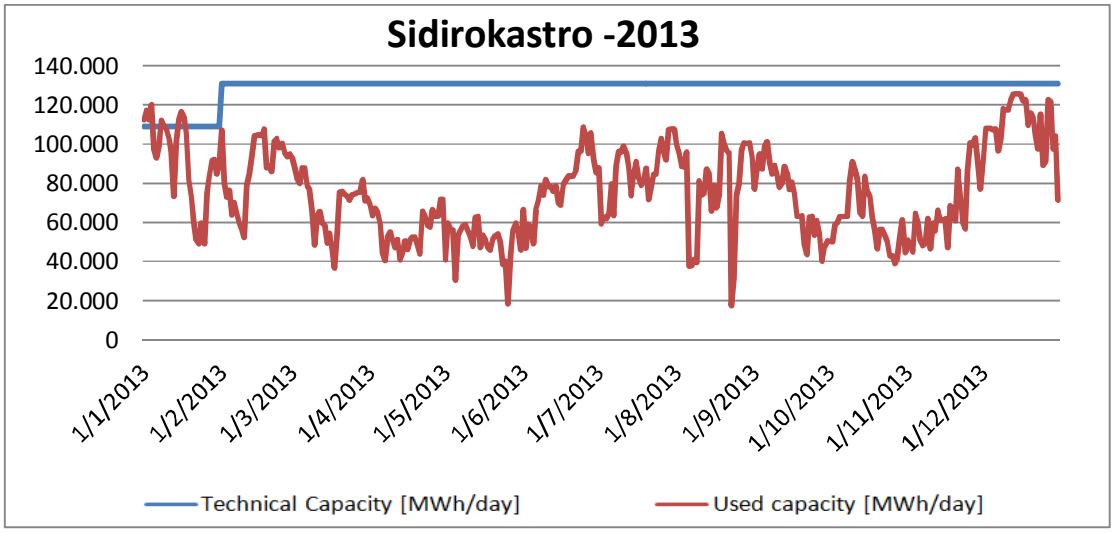

Kipi - 2011
35.000
30.000
25.000
20.000
15.000
10.000
5.000
0
1/1/2011
1/2/2011
1/3/2011
1/4/2011
1/5/2011
1/6/2011
1/7/2011
1/8/2011
1/9/2011
1/10/2011
1/11/2011
1/12/2011
Technical Capacity [MWh/day]
Used capacity [MWh/day]

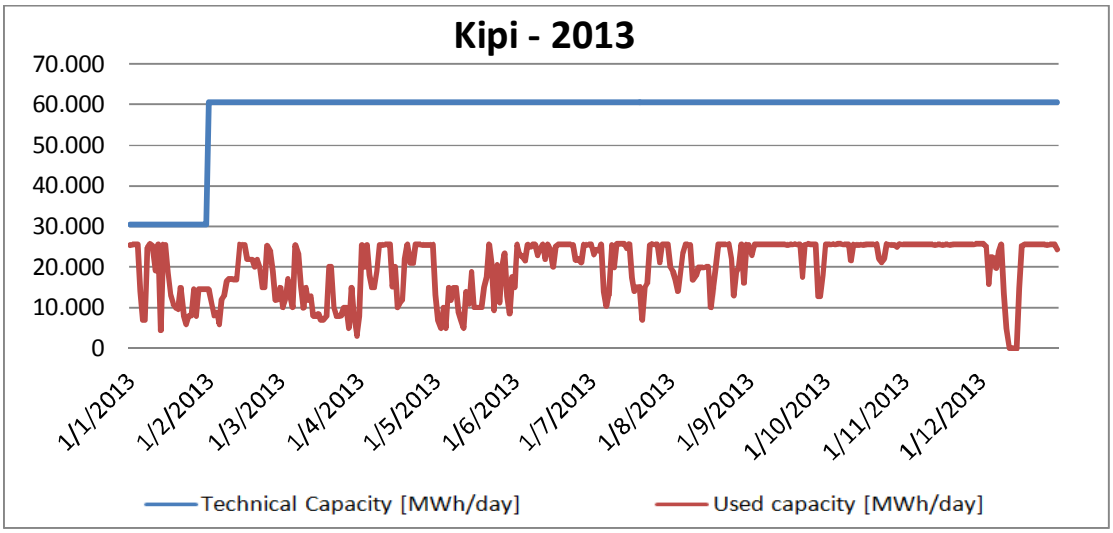

Agia Triada - 2011
150.000
125.000
100.000
75.000
50.000
25.000
0
1/1/2011
1/2/2011
1/3/2011
1/4/2011
1/5/2011
1/6/2011
1/7/2011
1/8/2011
1/9/2011
1/10/2011
1/11/2011
1/12/2011
Technical Capacity [MWh/day]
Used capacity [MWh/day]

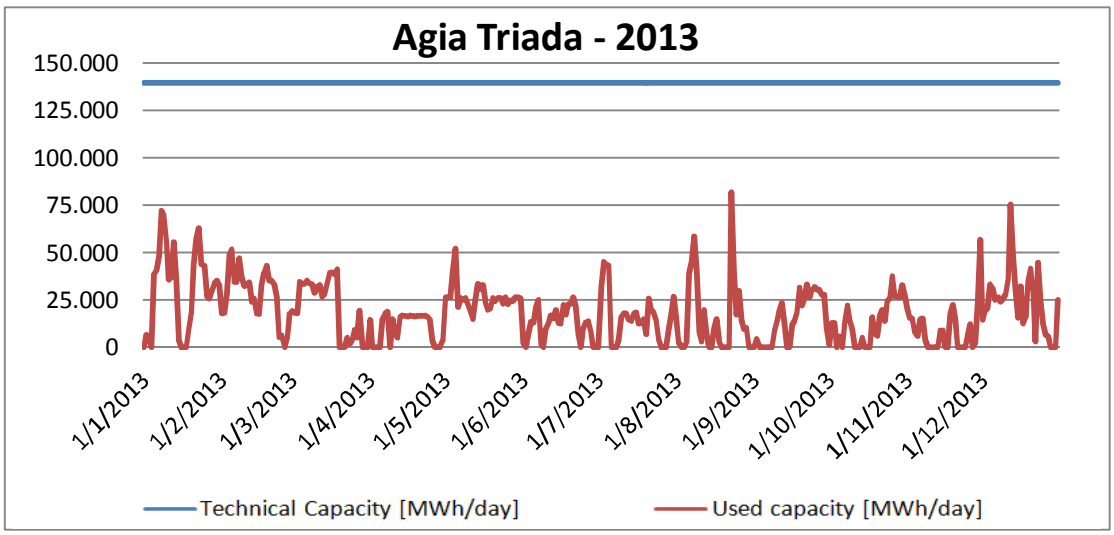

Sidirokastro - 2012
140.000
120.000
100.000
80.000
60.000
40.000
20.000
0
1/1/2012
1/2/2012
1/3/2012
1/4/2012
1/5/2012
1/6/2012
1/7/2012
1/8/2012
1/9/2012
1/10/2012
1/11/2012
1/12/2012
Technical Capacity [MWh/day]
Used capacity [MWh/day]

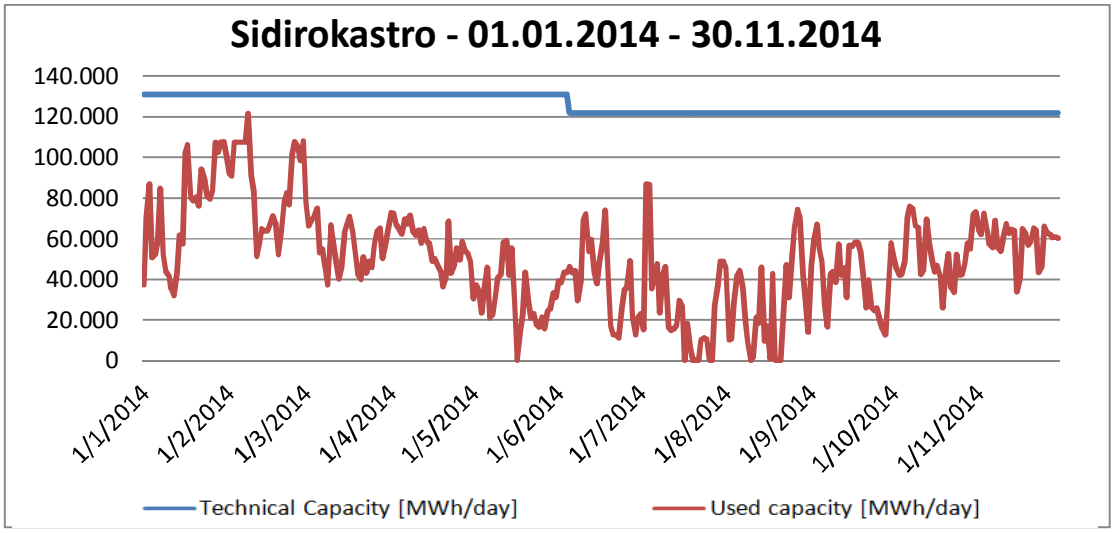

Kipi - 2012
35.000
30.000
25.000
20.000
15.000
10.000
5.000
0
1/1/2012
1/2/2012
1/3/2012
1/4/2012
1/5/2012
1/6/2012
1/7/2012
1/8/2012
1/9/2012
1/10/2012
1/11/2012
1/12/2012
Technical Capacity [MWh/day]
Used capacity [MWh/day]

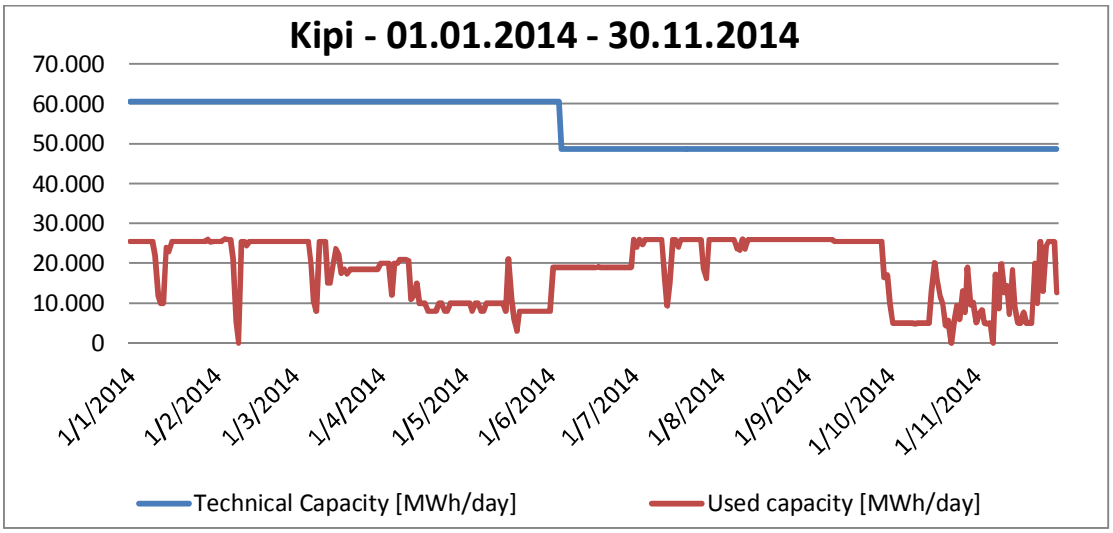

Agia Triada - 2012
175.000
150.000
125.000
100.000
75.000
50.000
25.000
0
1/1/2012
1/2/2012
1/3/2012
1/4/2012
1/5/2012
1/6/2012
1/7/2012
1/8/2012
1/9/2012
1/10/2012
1/11/2012
1/12/2012
Technical Capacity [MWh/day]
Used capacity [MWh/day]

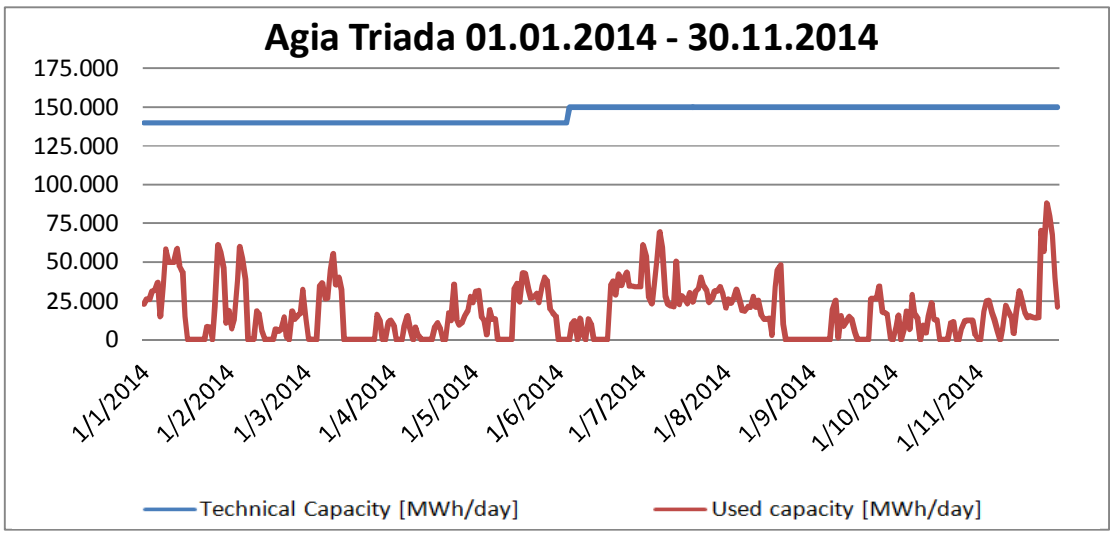

Sidirokastro -2013
140.000
120.000
100.000
80.000
60.000
40.000
20.000
0
1/1/2013
1/2/2013
1/3/2013
1/4/2013
1/5/2013
1/6/2013
1/7/2013
1/8/2013
1/9/2013
1/10/2013
1/11/2013
1/12/2013
Technical Capacity [MWh/day]
Used capacity [MWh/day]


Kipi - 2013
70.000
60.000
50.000
40.000
30.000
20.000
10.000
0
1/1/2013
1/2/2013
1/3/2013
1/4/2013
1/5/2013
1/6/2013
1/7/2013
1/8/2013
1/9/2013
1/10/2013
1/11/2013
1/12/2013
Technical Capacity [MWh/day]
Used capacity [MWh/day]


Agia Triada - 2013
150.000
125.000
100.000
75.000
50.000
25.000
0
1/1/2013
1/2/2013
1/3/2013
1/4/2013
1/5/2013
1/6/2013
1/7/2013
1/8/2013
1/9/2013
1/10/2013
1/11/2013
1/12/2013
Technical Capacity [MWh/day]
Used capacity [MWh/day]

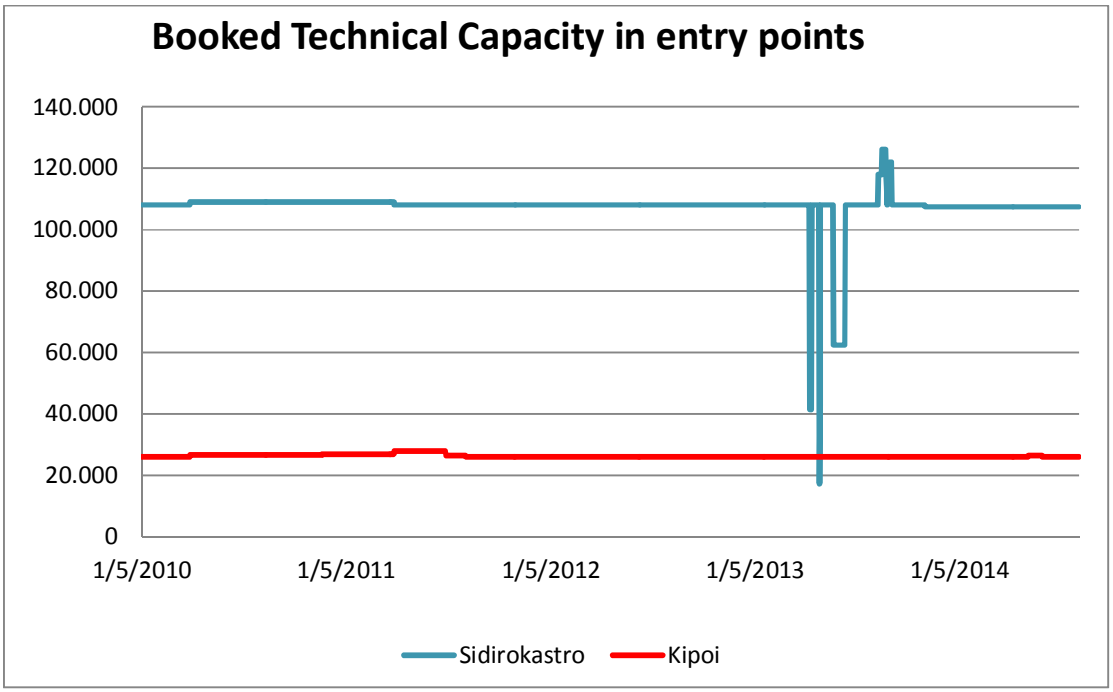

Sidirokastro - 01.01.2014 - 30.11.2014
140.000
120.000
100.000
80.000
60.000
40.000
20.000
0
1/1/2014
1/2/2014
1/3/2014
1/4/2014
1/5/2014
1/6/2014
1/7/2014
1/8/2014
1/9/2014
1/10/2014
1/11/2014
Technical Capacity [MWh/day]
Used capacity [MWh/day]


Kipi - 01.01.2014 - 30.11.2014
70.000
60.000
50.000
40.000
30.000
20.000
10.000
0
1/1/2014
1/2/2014
1/3/2014
1/4/2014
1/5/2014
1/6/2014
1/7/2014
1/8/2014
1/9/2014
1/10/2014
1/11/2014
Technical Capacity [MWh/day]
Used capacity [MWh/day]


Agia Triada 01.01.2014 - 30.11.2014
175.000
150.000
125.000
100.000
75.000
50.000
25.000
0
1/1/2014
1/2/2014
1/3/2014
1/4/2014
1/5/2014
1/6/2014
1/7/2014
1/8/2014
1/9/2014
1/10/2014
1/11/2014
Technical Capacity [MWh/day]
Used capacity [MWh/day]

The lack of contractual congestion at all the three Entry Points of the NNGTS is depicted.

The following diagram, presents the historical data for the booking of the TC for Delivery in primary and secondary markets for the Entry Points "Sidirokastro" and "Kipi", through which pipe gas flows to the Transmission System.



It is noted that in the secondary market, there is no TC for Delivery booking.

From what mentioned above, the absence of activation of third Users, except the main User, is obvious, in Entry Points for pipe gas. In those points - as well as in the Entry Point Agia Triada - no contractual congestion on the TC for Delivery booking is taking place.

Finally, the analysis of these data shows the very high concentration of the TC for Delivery booking in only one basic User. Additionally, it is highlighted that the users activated at the above Entry Points during the periods indicated, are registered in the RAE's Users Registry either as Suppliers or as eligible Customers and not as third parties. A consequence of this is that the use of NNGTS characterizes – primarily - the Greek natural gas Supply market.

3. Existing balancing scheme

The balancing process of the Transmission System is described in Chapter 8 of the Code. DESFA (the Greek TSO) provides balancing services, applying operational balancing of the

Transmission System through Balancing Actions, if the balance between deliveries and receptions of Natural Gas by Transmission System Users is not secured. From the balance between all deliveries and receptions, DESFA estimates any Unaccounted For Gas (UFG) quantity and allocates it to the Transmission Users. Based on the daily delivery/reception quantities of Natural Gas in the Entry/Exit Points of the Transmission System, and the UFG quantity allocated to every Transmission User, DESFA calculates the difference between deliveries and receptions of the User and informs him. The above are compatible with the provisions of Article 21 of the Regulation.

The supply of the annual quantity of Natural Gas, which is injected by DESFA into the Transmission System for the operational balancing (Balancing Gas), is materialized exclusively through an international open tender, which is compatible with Article 8 of the Regulation. In all tendering procurement procedures for Balancing Gas for the years 2011-2015, only the main user participated, which reflects the illiquidity of the wholesale gas market.

The settlement of the difference between the daily deliveries and receptions of the Transmission User (Daily Gas Imbalance - HEEF) is based on the tolerance limits, which is common for all Transmission Users and has a value of (+/-) 10% in case of positive and negative differences respectively.

If the HEEF lies within the interval defined by the tolerance limits applied to the maximum value of the total Transmission Capacity (TC) for Delivery and for Reception of the User, the User is credited / debited with the amount of the daily of balancing gas price (HTAE) multiplied by the HEEF. Otherwise, the User is credited/debited additional charges, proportional to the excess.

The calculation of HTAE is related to the supply price of Balancing Gas quantity of DESFA, based on the terms of the international tender. The methodology of HTAE calculation and the relevant one for the allocation of Balancing Gas to the Transmission Users, must be approved by RAE. The above is compatible with the provisions of Articles 46 and 50 of the Regulation.

DESFA keeps a separate account (Balancing Account) which is debited/credited with the amounts related to the DESFA's acts for balancing. The Balancing Account must be balanced at the end of each year. The above is compatible with the provisions of Article 29 of the Regulation.

DESFA's balancing acts announced to Transmission Users, while in DESFA's website are published the data specified in the relevant provisions of Regulation (EC) 715/2009, in accordance with Articles 32 and 33 of the Regulation. Specifically, daily historical quality data (Gross Calorific Value) and volume data (on an hourly and daily basis) of the NG delivered to and the received from the NNGTS are published, aggregated data for daily gas delivery and reception nominations of Transmission Users, DESFA estimations of the linepack and its hourly

variation during the day, as well as data related to the available TC for Delivery and Reception at Entry and Exit Points of NNGTS respectively.

Finally, there are no intraday obligations and no flexibility service is provided for the linepack.

4. Analysis of short-term wholesale gas market

This section presents the historical market data, in order to estimate the degree of development and liquidity of short-term wholesale market.

Emphasis is given on the capabilities and utilization of the transactions between market participants, as well as on relevant information reflecting the degree of activation of such transactions on short term basis, within the limits of the existing legal framework.

Regarding the legal frame (Code), what is provided for the possibility of trading and transactions between the NG market players are:

The Trading / transaction made through bilateral agreements and concerns to:

- Natural Gas resale between the Eligible Customers (Article 19 of the Code)
- LNG quantities transactions (Chapter 11 of the Code)
- Ownership transfer at the Virtual Nomination Point (VNP) through the Users Daily Nominations via bilateral agreements, in accordance with Chapter 4 of the Code.

The transactions are being made branded and traders take full risk for their settlement.

Tables below present the evolution of such transactions and the traded quantities for the years 2010-2014.

Year	Transactions/year	LNG Users	LNG quantity [MWh]
2010	0	0	0,000
2011	6	3	399.000,000
2012	20	2	2.857.000,000
2013	2	2	42.264,158
2014	4	2	940.000,000

Year	User	Delivered quantity at VNP [MWh]	Received quantity by VNP [MWh]	Virtual delivered quantity [MWh]	Virtual received quantity [MWh]	Physical delivered quantity [MWh]	Physical received quantity [MWh]
2012	1	0	0	0	0	41.090.219,23	43.263.318,74
	2	0	0	0	0	3.340.531,76	3.190.900,42
	3	0	0	0	0	366.117,70	326.838,17
	4	0	0	0	0	0	0
	5	0	0	0	0	322.536,07	305.440,81
	6	0	0	1.679.201,23	0	0	252,23
2013	1	0	0	0	0	40.241.901,61	41.142.530,66
	2	0	0	0	0	115.983,91	107.477,48
	3	0	0	0	0	200.062,02	200.062,02
	4	0	0	409.892,25	0	0	382,744
	5	0	0	109.459,63	0	0	109.459,63
2014	1	0	388.616,20	0	0	25.272.779,77	26.769.626,56
	2	0	356.400,00	0	0	1.225.770,08	801.676,19
	3	353.100,00	0	0	0	0	327.396,99
	4	0	6.350,00	0	0	6.348,92	0
	5	0	0	8,658	0	0	9.007,88
	6	398.266,20	0	0	0	0	441.362,98

The analysis and the processing of the historical data for the VNP use, results to a total number of 291 transactions, through Daily Nominations of Transmission Users for the year 2014, after the entry into force of the second revision of the Code (GG B' 3131 / 12.09.2013).

It must be mentioned that, during that period, changes in continuity of use of the VNP regarding Delivery / Reception of NG quantities by the same pair of Transmission Users, was observed only in 5 cases, which reflects the low liquidity of short-term wholesale gas market. The above mentioned are shown in Table below.

Year	Use of VNP according to Daily Nominations	Transmission Users	Number of changes of continuous VNP use by a single pair of Users.
2014	291	5	5

The following Table shows the evolution of the number of Natural Gas resale transactions between Eligible Customers per year for the time period 2011-2014.

Year	Transactions/year	Transmission Users
2011	6	1
2012	10	1
2013	13	2
2014	1	1

The evolution of bilateral transactions follows, for the years 2010 - 2014, as a percentage of the total annual quantity of NG receptions of the respective years.

Bilateral Transactions of NG Quantities (as a percentage of the total annual amount of NG receptions)					
	2010	2011	2012	2013	2014
Resale	0%	0,37%	4%	1%	0%
Transactions via the VDP	0%	0%	0%	0%	3%
LNG transactions	0%	0,78%	6%	0,104%	4%

In particular, until now, gas supply from consumers is undertaken:

- either via supply contracts, following respective bilateral negotiations between suppliers and consumers,
- or through open public tender procedure for assigning NG quantities by the basic User, following a process similar to the one which deals with the transfer of unused TC for Delivery at the entry points of the NNGTS.

From the above it is concluded that:

a) There is not enough developed short-term wholesale natural gas market

b) There are neither important bilateral gas transactions, nor remarkable activation of more than one User at the Entry Points of the Transmission System, particularly in Sidirokastro and Kipi through which pipe gas enters to NNGTS, despite the fact that short-term TC for Delivery booking is available and furthermore the Code contains all the relevant provisions to prevent contractual congestion.

c) As a result of the above mentioned, there is no mechanism for determining the gas price on the basis of supply and demand in the short term in order to determine the marginal price of gas

d) Both the figures of bilateral transactions and the market shares show an extremely limited liquidity. The lack of participation, beyond the basic User, in international tendering procedures for balancing gas, also lies in the same direction.

e) Limited use of LNG terminal in Revythoussa, which is the most flexible entrance of the NNG TS, especially in the last three years. According to the table showing the data of unloads of the years 2010-2014, for the period 2012-2014 only two LNG Users are active.

It must also be mentioned that there is also lack of liquidity in the wholesale gas market of the neighboring countries with which the NNGTS is interconnected.

5. Proposed interim measures / actions to remove them

Based on the data analysis of Greek NG market, which reflect the current lack of liquidity of the wholesale market, DESFA proposes to apply the following interim measures according to Article 46 of the Regulation:

1. Continuation of the implementation of the existing balancing scheme that is compatible with the provisions of Articles 21 and 48 of the Balancing Regulation. Lack of liquidity makes necessary the existence of at least one annual balancing gas supply contract by DESFA for the security of operation of the National Natural Gas Transmission System (NNGTS).
2. Creation of a balancing platform, according to Article 47 of the Regulation and of a Virtual Trading Point (VTP). The balancing platform, that can evolve to a trading platform, will operate initially in a pilot mode; through this, the procurement of, at least, balancing gas on short term basis will take place by DESFA or / and Users. DESFA will continue to act as the last reserve for balancing gas. After the pilot operation, an evaluation of the situation will take place (with respect to the liquidity of the wholesale NG market) in order to examine if the conditions exist for a faster implementation of the whole Balancing Regulation. It is estimated that the pilot platform will start operation within 2016.
3. In addition, DESFA will propose to RAE the revision / introduction of provisions in the regulatory framework with the purpose of alignment with the Balancing Regulation. In particular, it will be examined:
   (a) Introduction of a within-day re-nomination cycle by Transmission Users
   (b) Obligation for booking TC exclusively in entry or exit points for the full adoption of an entry/exit capacity booking system, with the use of the VNP in any case.
   (c) Change of the NG resale scheme in order the latter to take place exclusively at the VNP, and then, at a later stage, via the VTP in accordance to paragraph 2 of

this Chapter. NG transactions will be separated from the NG Transmission Contracts and no approval by DESFA will be needed for them.

(d) Alternative ways to treat Unaccounted-for-gas (UFG) quantity.

(e) In conjunction with the revision of Tariff Regulation:
- Different pricing of the Daily Gas Imbalance (HEEF) for Users with positive or negative HEEF, linked also with their corresponding level.
- Gradual reduction of tolerance limits, according to Article 50 of the Balancing Regulation.

4. Full implementation of Balancing Regulation by 2019, when the duration of interim measures expires. It is estimated that from 2020, the wholesale market will have an adequate liquidity due to the start of operation of new projects which will diversify the NG sources of the Greek NG market. Since interim measures are intermediate steps towards full implementation of Balancing Regulation, there is no reason to remove them, but only to optimize and, possibly, to supplement them.

The time schedule for the implementation of the above mentioned interim measures, will be updated in the frame of the annual report prepared by DESFA, and subject to RAE's approval, according to Article 46 of the Balancing Regulation.

6. Actions that contribute to the increase of liquidity of short-term gas market

It is estimated that the level of liquidity of the short-term natural gas market will increase in the future for the following reasons:

1. Finalization of the second upgrade of the Revithoussa LNG terminal, which is expected to take place by the end of 2016 (it is already under construction). The increase of the available storage capacity given to the Users, is expected to relax the current restrictions on the temporary storage of LNG. The impact of this project on the liquidity of the wholesale market, will be assessed during the pilot implementation of the balancing platform, under paragraph 3 of Section 5 hereof.

2. With the start of operation of the TAP pipeline (estimated by 2020, Final Investment Decision has been taken), which will be connected to the NNGTS, additional natural gas quantities from a new supply source (Azerbaijan) could be delivered to Greece, while natural gas from Italy (or other European markets associated with Italy) can be delivered to Greece via virtual reverse (backhaul) flow through the TAP pipeline.

3. The implementation of the planned Interconnector Greece-Bulgaria (IGB) and / or the operation of the existing interconnection in bi-directional flow, will enable the delivery of natural gas quantities from the Romanian production and will also make possible for consumers / suppliers of Bulgarian and Romanian market to have access to the Greek hub.

4. The possible transition from a VTP to a trading NG hub of the wider region (eg including Bulgaria and Romania, regional gas hub) will contribute also to the increase of liquidity

5. The implementation of the planned Underground Storage (UGS) in South Kavala will enable the activation of more new LNG importers, since it will make possible to store regasified LNG to the UGS when it is not possible to be consumed within the temporary storage time period which is imposed by the effective operation of Revithoussa LNG terminal.

6. Possible developments related to the successor of the South Stream pipeline, as well as developments in the export routes of Eastern Mediterranean gas, may add new options and additional liquidity to the Greek hub.