Chalandri, Attica

Operation Report of the NNGS for the Year 2021

(In accordance with the provisions of paragraph 2.z of Article 68 of the Law 4001/2011 on the operation of Energy Markets Electricity and Natural Gas, for Research, Production and Hydrocarbon Transportation Networks and other regulations)

TABLE OF CONTENTS

1 General description of the National Natural Gas System ____ *3*

2 Report for the operation of NNGS ____ *6*

2.1 Technical Characteristics of the System ____ 6

2.2 Variations in Technical Characteristics of the System ____ 7

2.3 NNGTS Entry/Exit Points Capacity ____ 7

2.4 Load Balancing ____ 12

2.5 Maintenance Standard and Quality ____ 15

2.6 Congestion and Congestion Management ____ 21

2.7 Emergencies and Dealing with Emergencies ____ 23

2.8 Operating characteristics of NNGS ____ 23

2.9 Natural Gas Quantities historical data ____ 24

1. General description of the National Natural Gas System

The National Natural Gas System (NNGS) transports Natural Gas from the upstream Interconnected Natural Gas Transmission Systems of Bulgaria and Turkey, the Trans Adriatic Pipeline (TAP) and from the Liquefied Natural Gas (LNG) terminal, which is installed at Revithoussa island at Megara, to consumers connected to the NNGS in the Greek mainland.

The Natural Gas is delivered from the Users to four (4) Entry Points to the National Natural Gas Transmission System (NNGTS) and it is off-taken by the Users via forty-four (44) Exit Points in the Greek mainland, including Reverse Flow Exit Point 'SIDIROKASTRO', through which the delivery of Natural Gas quantities to the Interconnected Natural Gas Transmission System of Bulgaria is achieved.

The NNGS consists of:

- The main pipeline, with 512 Km length and 36'' & 30'' diameter, and the branches of total length 953.20 Km (containing (a) the underwater pipeline of Aliveri branch, with 14.20 Km length and 20" diameter and (b) the two (2) underwater pipes, each one a back-up to the other, of 24'' diameter each and of 620m and 630m length, that connect the Revithoussa LNG Station to the mainland), which connect various areas of the country to the main pipeline;
- The Metering Stations of the Entry Points 'SIDIROKASTRO', 'KIPI', 'NEA MESIMVRIA' and 'AGIA TRIADA' of the NNGTS;
- The Liquefied Natural Gas (LNG) Station at Revithoussa connected to the Entry Point 'AGIA TRIADA';
- The Compression Station at Nea Mesimvria, Thessaloniki;

- The Natural Gas Metering and Regulating Stations;
- The Control and Dispatching Centers;
- The Operation and Maintenance Centers of Sidirokastro Border Station, Eastern Greece, Northern Greece, Central Greece, Southern Greece and Peloponnese; and
- The Remote Control and Communication System.

The Revithoussa LNG Station is the only installation in the NNGS, which following its 2nd upgrade, can now temporarily store Natural Gas quantities up to 221,815.677 m^3 LNG. It consists of:

- Three (3) Liquefied Natural Gas storage tanks of 63,379.931 m^3, 63,379.931 m^3 and of 95,055.815 m^3 LNG storage capacity;
- LNG unloading installations of maximum LNG unloading rate 7,250 m^3 LNG/h; and
- LNG gasification installations of sustained maximum sendout rate 1,250 m^3 LNG/h.

Diagram 1: NNGS Geographical Depiction

2. Report for the operation of NNGS

2.1. Technical Characteristics of the System

Table 1 below shows the diameters and total lengths of the main pipeline and the branches of the NNGTS.

Natural Gas Pipeline	Diameter (inch)	Total Length (Km)
Main Pipeline	36 & 30	**512**
Transmission Branches of NNGTS		
Lavrion Branch	30	100.05
Keratsini Branch	30 & 24	24.48
HAR Branch	14	2.02
Oinofyta Branch	10	20.62
Volos Branch	10	40.42
Thessaloniki North - EKO Branch	24 & 10	9.70
Thessaloniki East Branch	24	24.41
Platy Branch	10	10.98
Karperi - Komotini Branch	24	216.79
Komotini - Kipi Branch	36	86.71
Alouminion Branch	20	28.12
Megara - Korinthos Branch	30	52.88
MOTOR OIL Branch	20	1.46
Trikala Branch	10	71.94
Thisvi Branch	20	26.27
Heron Branch	14	0.75
Aliveri Branch	20	73.13
Elefsina (ELPE) Branch	10	6.41
Korinthos - Megalopoli Branch	24	155.43
Revithoussa - Agia Triada Underwater Pipeline		
East Pipeline	24	0.62
West Pipeline	24	0.63
TOTAL (Transmission Branches and Underwater pipelines)		**953.20**

Table 1: Diameters and lengths of the NNGTS Natural Gas pipelines

2.2. Variations in Technical Characteristics of the System

During the Year 2021 and particularly on the 21st.07.2021, the Metering/Regulating Station 'KOSMIO' (U-2550) was put into operation at the new NNGTS Exit Point 'KOSMIO' with Technical Capacity 12,159,840 kWh/Day.

2.3 NNGTS Entry/Exit Points Capacity

Table 2 below shows the Technical Capacities of the Entry/Exit Points of the NNGTS, and the Maximum Capacity of the relative Metering/Regulating Stations of DESFA.

TECNICAL CAPACITIES OF THE NNGTS ENTRY/EXIT POINTS				
No.	**ENTRY POINT**	**Technical Capacity [kWh/Day] (1)**	**DESFA' s Metering/Regulating Station**	**Maximum Capacity of DESFA's Metering/Regulating Station [kWh/Day]**
1	SIDIROKASTRO (4)	117,804,036	M SIDIROKASTRO (U-2010)	180,383,280
2	AGIA TRIADA	204,481,800	M AGIA TRIADA (U-3020)	241,073,280
3	KIPI (3)	48,592,292	M KIPI (U-3900)	232,202,632
4	NEA MESIMVRIA (3)	53,368,256	M/R NEA MESIMVRIA (U-6910)	117,543,960
No.	**EXIT POINT**	**Technical Capacity [kWh/Day] (1)**	**DESFA' s Metering/Regulating Station**	**Maximum Capacity of DESFA's Metering/Regulating Station [kWh/Day]**
1	ALOYMINION	26,714,340	M AdG (U-2820)	26,714,340
2	ALOYMINION II	20,723,593	M AdG B (U-2830)	20,723,593
3	ALOYMINION III	6,678,585	M AdG III (U-TM1/TM5)	6,678,585
4	MOTOR OIL	26,714,340	M MOTOR OIL (U-7130)	26,714,340
5	MOTOR OIL II	21,371,472	M MOTOR OIL B (U-7140)	21,371,472
6	AG. THEODOROI	2,992,197	M/R AG, THEODOROI (U-7045)	2,992,197
7	ATHENS	101,876,740	M/R NORTH ATHENS (U-2910)	29,444,279
			M/R EAST ATHENS (U-2940)	29,444,279
			M/R THRIASIO (U-2960)	13,545,506
			M/R WEST ATHENS (U-2990)	29,442,676

8	ALEXANDROUPOLIS	7,480,015	M/R ALEXANDROUPOLIS (U-3630)	7,480,015
9	ALIVERI (PPC)	21,371,472	M PPC ALIVERI (U-6370)	21,371,472
10	VIPE LARISSA	2,671,434	M/R VIPE LARISSA (U-2515)	2,671,434
11	VOLOS	13,796,086	M/R VOLOS (U-2680)	13,796,086
12	VFL	6,493,989	M VFL (U-2170)	6,493,989
13	DRAMA	7,480,015	M/R DRAMA (U-2140)	7,480,015
14	ELPE	4,815,794	M/R EKO (U-2250)	4,815,794
15	ELPE-VEE	12,756,552	M ELPE ELEFSINAS (U-7420)	12,756,552
16	ELPE-HAR	8,014,302	M/R ATHENS ELDA (U-2970)	8,014,302
17	ENERGIAKI THESS. (ELPE)	26,714,340	M ELPE DIAVATA (U-2270)	26,714,340
18	HERONAS	10,685,736	M HERON (U-6020)	10,685,736
19	HERON II	22,441,482	M HERON B (U-6030)	22,707,189
20	THESSALONIKI	77,501,024	M/R THESSALONIKI NORTH (U-2240)	38,750,512
			M/R THESSALONIKI EAST (U-2220)	38,750,512
21	THISVI	23,738,101	M IPP THISVI (U-6650)	23,738,101
22	KAVALA	2,671,434	M/R KAVALA (TM4-A)	2,671,434
23	KARDITSA	5,342,868	M/R KARDITSA (U-6240)	5,342,868
24	KATERINI	7,480,015	M/R KATERINI (U-2340)	7,480,015
25	KERATSINI (PPC)	27,289,500	M PPC KERATSINI (U-3090)	27,289,500
26	KILKIS	11,754,309	M/R KILKIS (U-2060)	11,754,309
27	KOKKINA	2,671,434	M/R KOKKINA (U-2670)	2,671,434
28	KOMOTINI (PPC)	28,851,488	M/R PPC KOMOTINI (U-3570)	28,851,488
29	KOMOTINI	5,342,868	M/R KOMOTINI (U-3580)	5,342,868
30	KOSMIO	12,159,840	M/R KOSMIO (U-2550)	12,159,840
30	LAMIA	7,480,015	M/R LAMIA (U-2620)	7,480,015
31	LARISSA	13,843,371	M/R NORTH LARISSA (U-2520)	6,921,685
			M/R SOUTH LARISSA	6,921,685

			(U-2530)	
32	LAVRIO (PPC)	64,114,418	M PPC LAVRIO (U-3430)	64,114,418
33	MEGALOPOLIS (PPC)	42,742,945	M PPC MEGALOPOLIS (U-7320)	42,742,945
34	SPATA	3,072,149	M/R MARKOPOULO (U-3460)	3,072,149
35	XANTHI	11,754,309	M/R XANTHI (U-3530)	11,754,309
36	OINOFYTA	11,836,679	M/R THIVA (U-2740)	4,755,242
			M/R INOFYTA (U-2880)	7,081,437
37	PLATY	5,740,377	M/R PLATY (U-2410)	5,740,377
38	SALFA ANO LIOSSIA	2,671,434	M STATION ANO LIOSSIA (U-5010) (2)	
39	SALFA ANTHOUSSA	1,371,600	M STATION ANTHOUSA (U-5210)	1,371,600
40	SERRES	11,754,309	M/R SERRES (U-2110)	11,754,309
41	TRIKALA	5,342,868	M/R TRIKALA (U-6260)	5,342,868
42	FARSALA	1,870,003	M/R FARSALA (U-6280)	1,870,003
No.	**REVERSE FLOW EXIT POINT**	**Technical Capacity [kWh/Day] (1)**	**DESFA' s Metering/Regulating Station**	**Maximum Capacity of DESFA's Metering/Regulating Station [kWh/Day]**
1	SIDIROKASTRO (4)	64,826,100	M SIDIROKASTRO (U-2010)	180,383,280

Table 2

Comments on Table 2:

1. 'Technical Capacity' is the maximum invariable capacity that DESFA is able to offer to the Transmission Users, considering the integrity and the operational demands of the NNGTS.

2. Given that DESFA has not completed the installation works of the metering facilities through which gas shall be supplied from the Transmission System to the relative Receiving Natural Gas Installation and until the completion of these metering facilities, Exit Point will be considered the location of the last insulating joint weld on the pipeline which supplies the Receiving Natural Gas Installation within the plot land already purchased by DESFA for the construction of the relevant metering facilities.

3. The sum of the Technical Capacities of the Entry Points "KIPI" and "NEA MESIMVRIA" cannot exceed 53,368,256 kWh/Day.

4. From 01.10.2021 the Technical Capacity of the Entry Point "SIDIROKASTRO" is 117,265,409 kWh/Day and the Technical Capacity of the Reverse Flow Exit Point "SIDIROKASTRO" is 64,529,700 kWh/Day, due to a change in the Gross Calorific Value used to calculate the energy.

Finally, Table 3 depicts the Annual profile of Natural Gas Deliveries and Off-takes at the Entry and Exit Points of the NNGTS for the Year 2021.

Annual profile of Natural Gas Deliveries/Off-takes and Daily peaks at the NNGTS Entry/Exit Points					
Year 2021					
Entry Point	**Technical Capacity [kWh/Day]**	**Annual Average of Natural Gas Deliveries to the Point [kWh/Day]**	**Daily peak of the Point [kWh/Day]**	**Annual Average of Natural Gas Deliveries to the Point as a percentage of Technical Capacity [%]**	**Daily peak of the Point as a percentage of Technical Capacity [%]**
SIDIROKASTRO (1)	117,804,036	96.898.705	118.368.959	82,3	100,5
AGIA TRIADA	204,481,800	67,731,780	201,456,727	33.1	98.5
KIPI	48,592,292	11,030,954	38,018,789	22.7	78.2
NEA MESIMVRIA	53,368,256	37.309.603	61.354.301	69,9	115,0
Exit Point	**Technical Capacity [kWh/Day]**	**Annual Average of Natural Gas Off-takes from the Point [kWh/Day]**	**Daily peak of the Point [kWh/Day]**	**Annual Average of Natural Gas Off-takes from the Point as a percentage of Technical Capacity [%]**	**Daily peak of the Point as a percentage of Technical Capacity [%]**
ALOYMINION	26,714,340	11,069,562	17,159,399	41.4	64.2
ALOYMINION II	20,723,593	12,440,322	18,916,903	60.0	91.3
ALOYMINION III	6,678,585	2,014,513	3,041,319	30.2	45.5
MOTOR OIL	26,714,340	9,152,602	15,626,318	34.3	58.5
MOTOR OIL II	21,371,472	9,297,222	18,089,946	43.5	84.6
AG, THEODOROI	2,992,197	130,267	238,879	4.4	8.0
ATHENS	101,876,740	11,666,282	43,512,807	11.5	42.7
ALEXANDROUPOLIS	7,480,015	97,168	191,374	1.3	2.6
ALIVERI (PPC)	21,371,472	13,509,466	19,060,811	63.2	89.2
VIPE LARISSA	2,671,434	231,608	363,301	8.7	13.6
VOLOS	13,796,086	2,296,448	7,369,303	16.6	53.4
VFL	6,493,989	3,453,292	4,853,333	53.2	74.7
DRAMA	7,480,015	869,803	1,060,107	11.6	14.2

ELPE	4,815,794	1,215,495	2,423,685	25.2	50.3
ELPE-VEE	12,756,552	5,061,158	13,693,280	39.7	107.3
ELPE-HAR	8,014,302	2,870,315	7,500,318	35.8	93.6
ENERGIAKI THESS. (ELPE)	26,714,340	11,121,808	18,201,030	41.6	68.1
HERONAS	10,685,736	1,094,179	6,029,025	10.2	56.4
HERON II	22,441,482	10,082,141	18,944,770	44.9	84.4
THESSALONIKI	77,501,024	10,249,455	37,678,133	13.2	48.6
THISVI	23,738,101	10,088,520	18,205,272	42.5	76.7
KAVALA	2,671,434	3,044	25,977	0.1	1.0
KARDITSA	5,342,868	662,980	2,124,772	12.4	39.8
KATERINI	7,480,015	307,867	505,170	4.1	6.8
KERATSINI (PPC)	27,289,500	0	0	0.0	0.0
KILKIS	11,754,309	1,405,935	2,214,284	12.0	18.8
KOKKINA	2,671,434	180,508	300,864	6.8	11.3
KOMOTINI (PPC)	28,851,488	11,856,847	22,048,375	41.1	76.4
KOMOTINI	5,342,868	164,112	251,501	3.1	4.7
KOSMIO	12,159,840	146	26,916	0.0	0.2
LAMIA	7,480,015	169,288	269,178	2.3	3.6
LARISSA	13,843,371	2,383,996	8,219,206	17.2	59.4
LAVRIO (PPC)	64,114,418	21,222,992	42,940,757	33.1	67.0
MEGALOPOLIS (PPC)	42,742,945	19,815,576	31,078,491	46.4	72.7
SPATA	3,072,149	319,787	573,310	10.4	18.7
XANTHI	11,754,309	173,198	329,882	1.5	2.8
OINOFYTA	11,836,679	3,272,575	4,293,863	27.6	36.3
PLATY	5,740,377	16,355	116,762	0.3	2.0
SALFA ANO LIOSSIA	2,671,434	215,465	330,611	8.1	12.4
SALFA ANTHOUSSA	1,371,600	96,048	370,457	7.0	27.0
SERRES	11,754,309	761,344	1,673,112	6.5	14.2
TRIKALA	5,342,868	572,077	2,056,717	10.7	38.5
FARSALA	1,870,003	61,214	263,710	3.3	14.1

Reverse Flow Exit Point	Technical Capacity [kWh/Day]	Annual Average of Natural Gas Off-takes from the Point [kWh/Day]	Daily peak of the Point [kWh/Day]	Annual Average of Natural Gas Off-takes from the Point as a percentage of Technical Capacity [%]	Daily peak of the Point as a percentage of Technical Capacity [%]
SIDIROKASTRO (1)	64,826,100	20.816.363	57.250.000	32,1	88,3

Table 3

Comments on Table 3:

1. From 01.10.2021 the Technical Capacity of the Entry Point "SIDIROKASTRO" is 117,265,409 kWh/Day and the Technical Capacity of the Reverse Flow Exit Point "SIDIROKASTRO" is 64,529,700 kWh/Day, due to a change in the Gross Calorific Value used to calculate the energy.

2.4. Load Balancing

Balancing Gas is the Natural Gas required for the load balancing of the NNGTS. The Balancing Gas Quantity that the Operator injects/takes to/from the NNGTS, during a certain period, is set out to create a balance between Natural Gas Deliveries and Off-takes (during the same period) so as in every case the reliable, safe and efficient operation of the NNGS is considered secure. As part of his responsibilities and obligations, DESFA ensures the above balance by undertaking Balancing Actions, taking into account the losses and the stored Natural Gas quantities in the NNGTS.

In accordance with the provisions of Chapter 8 of the NNGS Network Code, during the Year 2021 the Operator could undertake Balancing Actions through (a) purchase and sale of Balancing Gas in the form of Short-Term Standardized Products which are auctioned at the Balancing Platform and/or (b) use of Balancing Services through Balancing Services Contracts.

Diagram 2 on the next page shows the Balancing Actions performed by the Operator during the Year 2021.

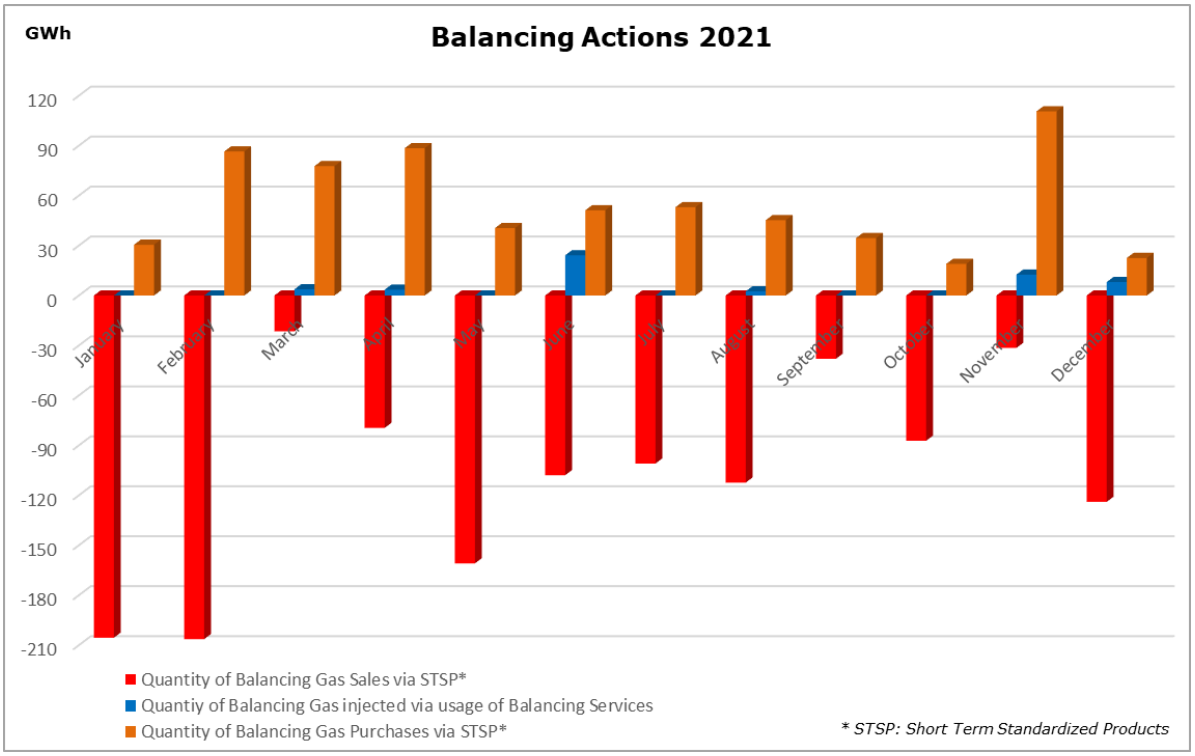

Diagram 2

Table 4 on the next page shows data on the cost/revenue, frequency and quantity of the Balancing Actions undertaken by the Operator during the Year 2021, in accordance with the provisions of paragraph 7 of Article 44^{A} of the NNGS Network Code.

	Balancing Gas Purchases via usage of LNG Supply Agreements for performing Balancing Services			Balancing Gas Purchases via Short Term Standardized Products			Balancing Gas Sales via Short Term Standardized Products		
	Quantiy of Balancing Gas injected {kWh}	Balancing LNG Supply Cost	Frequency of Balancing Gas injected (number of Days)	Quantity of Balancing Gas Purchases {kWh}	Balancing Gas Purchases Cost	Frequency of Balancing Gas Purchases (number of Days)	Quantity of Balancing Gas Sales {kWh}	Balancing Gas Sales Revenue	Frequency of Balancing Gas Sales (number of Days)
JANUARY	0	0	0	30,500,000	949,965.07 €	5	205,480,000	2,467,233.03 €	23
FEBRUARY	0	0	0	86,500,000	2,407,663.00 €	6	206,350,000	2,160,111.73 €	21
MARCH	3,748,679	0	1	77,710,000	1,705,906.02 €	9	21,500,000	259,554.40 €	4
APRIL	3,540,929	0	1	88,500,000	1,968,568.50 €	9	79,500,000	1,171,844.81 €	12
MAY	0	0	0	40,510,000	1,066,703.00 €	5	160,840,000	2,456,393.16 €	16
JUNE	24,172,752	866,250.00 €	2	51,180,000	2,295,065.44 €	6	107,900,000	2,086,898.58 €	13
JULY	0	626,535.00 €	0	53,060,000	1,801,652.61 €	8	100,910,000	2,229,085.20 €	14
AUGUST	2,491,926	0	1	45,250,000	2,149,370.80 €	9	112,350,000	3,056,258.03 €	12
SEPTEMBER	0	0	0	34,500,000	1,988,778.56 €	7	38,000,000	1,492,397.59 €	8
OCTOBER	0	0	0	19,000,000	1,721,724.66 €	4	87,200,000	4,737,147.24 €	15
NOVEMBER	12,585,392	932,000.00 €	3	110,600,000	9,810,539.10 €	15	31,460,000	1,711,098.92 €	6
DECEMBER	8,098,957	826,000.00 €	3	22,560,000	2,831,747.98 €	4	123,920,000	7,473,863.76 €	15
YEARLY SUM	**54,638,635**	**3,250,785.00 €**	**11**	**659,870,000**	**30,697,684.74 €**	**87**	**1,275,410,000**	**31,301,886.45 €**	**159**

Table 4

2.5 Maintenance Standard and Quality

Table 5 shows the Maintenance Program of NNGS for the Year 2021, as it was announced in DESFA website, according to the provisions of Article 98 of the NNGS Network Code, and its revision. Preventive and repairing maintenance of all electromechanical installations, supervision, management and control of the pipeline row zone as well as the supervision and control of cathodic and lighting protection of the pipeline and the installations were carried out in accordance with the provisions of the maintenance manuals, the current legislation and the experience granted so far by the multiannual operation of the system.

The calibration of the measuring systems was done according to Table 6, with only minor time deviations from the Annual Calibration Program that was uploaded on DESFA website in December 2020, according to the provisions of Article 27 of the NNGS Metering Regulation.

DESFA is certified with ISO 9001:2008, OHSAS 18001:2004 & EN ISO 14001:2004 for all his activities, including the procedures of preventive and repairing maintenance and calibration of measuring systems. Furthermore, DESFA has a Pressure and Chemical Laboratory and a Chemical Analysis Testing Laboratory certified by the Hellenic Accreditation System (E.SY.D.) with ELOT EN ISO/IEC 17025:2017.

NATIONAL NATURAL GAS TRANSMISSION SYSTEM MAINTENANCE PROGRAM - YEAR 2021 / NON-SCHEDULED MAINTENANCE						
No.	**NNGS POINT**	**DESCRIPTION OF WORKS**	**IMPLICATIONS**	**PERIOD OF WORKS**	**MAINTENANCE DAYS**	**REMARKS**
1	Entry Point: 'NEA MESIMVRIA'	Control of equipment of the installation of the interconnection of the NNGTS with the TAP network in Nea Mesimvria Thessaloniki	Transmission Capacity for Delivery at Entry Point 'NEA MESIMVRIA': (A) 0 kWh/Day [for the Days January 01and 02] (B) 17,477,850 kWh/ Day [for the Days January 03 and 04] and (C) 34,500,000 kWh/ Day [for the Days January 05]	01.01.2021 07:00 – 06.01.2021 07:00	5	Works were not included in the NNGS Maintenance Program for the Year 2021
2	Entry Points: 'SIDIROKASTRO' 'NEA MESIMVRIA' Reverse Flow Exit Point: 'SIDIROKASTRO'	In Line Inspection in the 'Kipi-Komotini' pipeline section of the NNGTS (1)	Transmission Capacity for Delivery at Entry Point 'SIDIROKASTRO': 75,000,000 kWh/Day Transmission Capacity for Delivery at Entry Point 'NEA MESIMVRIA': 23,000,000 kWh/Day Transmission Capacity for Reception at Reverse Flow Exit Point 'SIDIROKASTRO': 0 kWh/Day	08.03.2021 07:00 - 10.03.2021 07:00	2	Works were included in the NNGS Maintenance Program for the Year 2021
3	Entry Point: 'SIDIROKASTRO' Reverse Flow Exit Point: 'SIDIROKASTRO'	In Line Inspection in the 'Kula - Sidirokastro' pipeline section of the NNGTS	Transmission Capacity for Delivery at Entry Point 'SIDIROKASTRO': 112,000,000 kWh/Day Transmission Capacity for Reception at Reverse Flow Exit Point 'SIDIROKASTRO': 0 kWh/Day	12.03.2021 07:00 – 14.03.2021 07:00	2	Works were included in the NNGS Maintenance Program for the Year 2021
4	Entry Points: 'SIDIROKASTRO' 'KIPI' Reverse Flow Exit Point: 'SIDIROKASTRO'	- Maintenance at Nea Mesimvria Compression Station [three (3) Days] - Works of rearangement of pipelines at Nea Mesimvria Compression Station to achieve Natural Gas reverse flow [eight (8) Days]	Transmission Capacity for Delivery at Entry Point 'SIDIROKASTRO': (A) 16,000,000 kWh/Day [for the Days May 14 – May 19] and (B) 49,085,015 kWh/Day [for the Day May 20] Transmission Capacity for Delivery at Entry Point 'KIPI': 0 kWh/Day Transmission Capacity for Reception at Reverse Flow Exit Point 'SIDIROKASTRO': (A) 0 kWh/Day [for the Days May 14 – May 19] and (B) 27,010,875 kWh/Day [for the Day May 20]	14.05.2021 07:00 – 22.05.2021 07:00	8	Works were included in the NNGS Maintenance Program for the Year 2021
5	Entry Point: 'NEA MESIMVRIA'	Replacement of a damaged valve in the interconnection station (U-6930) of the DESFA and TAP networks	Transmission Capacity for Delivery at Entry Point 'NEA MESIMVRIA': 0 kWh/Day	31.08.2021 07:00 – 03.09.2021 07:00	3	Works were included in the NNGS Maintenance Program for the Year 2021
6	Entry Points: 'SIDIROKASTRO' 'KIPI' 'NEA MESIMVRIA' Reverse Flow Exit Point: 'SIDIROKASTRO'	- Maintenance at Border Metering Station (BMS) Sidirokastro [two (2) Days] - Maintenance at Nea Mesimvria Compression Station [four (4) Days]	Transmission Capacity for Delivery at Entry Point 'SIDIROKASTRO': 0 kWh/Day Transmission Capacity for Delivery at Entry Point 'KIPI': 23,000,000 kWh/Day Transmission Capacity for Delivery at Entry Point 'NEA MESIMVRIA': 43,000,000 kWh/Day Transmission Capacity for Reception at Reverse Flow Exit Point 'SIDIROKASTRO': 0 kWh/Day [for the Days September 27 and 28]	27.09.2021 07:00 – 01.10.2021 07:00	4	Works were included in the NNGS Maintenance Program for the Year 2021
LNG FACILITIES MAINTENANCE PROGRAM - YEAR 2021 / NON-SCHEDULED MAINTENANCE						

No.	NNGS POINT	DESCRIPTION OF WORKS	IMPLICATIONS	PERIOD OF WORKS	MAINTENANCE DAYS	REMARKS
1	Revithousa LNG Station	Replacement of control system of Revithousa LNG Station's unloading arms movement	LNG Injection Rate: 0 m^3 LNG/hour (2)	01.04.2021 07:00 – 11.04.2021 07:00	10	Works were included in the LNG Facilities Maintenance Program for the Year 2021
2	Revithousa LNG Station	Maintenance of Revithousa LNG Station's unloading arms	LNG Injection Rate: 5,500 m^3 LNG/hour	10.05.2021 07:00 – 11.08.2021 07:00	93	Works were included in the LNG Facilities Maintenance Program for the Year 2021
3	Revithousa LNG Station	Maintenance of Revithousa LNG Station's unloading arms - Phase B	LNG Injection Rate: 5,500 m^3 LNG/hour	16.08.2021 07:00 – 31.11.2021 07:00	106	Works were included in the LNG Facilities Maintenance Program for the Year 2021

Table 5

Comments on Table 5:

1. The execution of these works took place successfully because during the above period the necessary Natural Gas flow conditions occurred, that had been defined as (a) at the Entry Point "Kipi" the Natural Gas flow to be greater than 38,000,000 kWh/Day and (b) at the Exit Point "Komotini (PPC)" to be greater than 15,000,000 kWh/Day.

2. LNG Cargo Unloading was not available during the execution of these works.

CALIBRATIONS – YEAR 2021

ENTRY POINT STATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
SIDIROKASTRO / U – 2010				15-16, 20-23						14-15, 18-21		
AGIA TRIADA / U – 3020				8-9						13-14		
KIPI / U – 3900				21-22						21-22		
EXIT POINT STATION	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**
PPC LAVRIO / U – 3430			16 - 19				5 - 9				1 - 5	
THRIASSIO / U – 2960					11						9	
PPC ALIVERI PPC / U – 6370	20						14					
ATHENS WEST / U – 2990						22-23						16
ATHENS NORTH / U – 2910				8					27			
ATHENS EAST / U – 2940				12						7		
STATION ANTHOUSA / U-5210				13						8		
ATHENS HAR / U-2970		8						26				
INOFYTA / U – 2880						8						14
HERONAS / U – 6020			9						6			
HERON B / U – 6030			9						7			
MARKOPOULO / U-3460					10						10	

PP THISVI / U-6650	18						13					
AdG / U – 2820						15-16						7
AdG B / U-2830						16						09
AdG III / TM1/TM5						17						08
THIVA / U-2740	19						12					
ELPE ELEFSINAS / U-7420				6					27			
MOTOR OIL / U – 7130	13-14						28-29					
MOTOR OIL B / U – 7140	20						24-25					
PPC MEGALOPOLI / U – 7320		10						27 & 30				
AG. THEODOROI / U – 7045				6-7						20-21		
VOLOS / U – 2680					17-18						16-17	
LARISSA NORTH / U – 2520					19-20						18-19	
LARISSA SOUTH / U – 2530					24-25						24-25	
VIPE LARISSA / U – 2515					7 & 10						3-4	
LAMIA / U–2620					5-6						10-11	
KARDITSA / U–6240					12-13						8-9	
TRIKALA / U-6260						2-3						2 & 6
FARSALA / U-6280					11						15	
KOKKINA / U-2670					26-27						29-30	
THESSALONIKI NORTH / U–2240				19-20						20		

THESSALONIKI EAST / U-2220				15-16						18-19		
ELPE DIAVATA / U-2270				21						25-26		
PLATY / U–2410				28						4, 5, 8		
EKO / U–2250				26						25 & 27		
KILKIS / U–2060					6-7						2-3	
KATERINI / U–2340				5							4-5	
PPC KOMOTINI / U–3570			24, 30-31				5-8				23-25	
KOMOTINI / U-3580				23 & 29						8 & 27		
KAVALA / TM4-A				27						11		
VFL / U–2170						3-4						1 & 3
XANTHI / U–3530			11-12						23 & 28			
ALEXANDROUPOLIS / U–3630					13-14						11-12	
DRAMA / U–2140			29						22-23			
SERRES / U–2110			22						20-21			

Table 6

2.6 Congestion and Congestion Management

Congestion occurs when the available Transmission Capacity at an Entry Point or Exit Point or Reverse Flow Entry Point or Reverse Flow Exit Point is not sufficient to fulfill a User's request for Booking Transmission Capacity at that Point in order to serve a new Natural Gas Consumer.

Table 7 below presents the Technical Capacities of the NNGTS Entry/Exit/ Reverse Flow Exit Points and the Maximum Booked Transmission Capacity (MBTC) at the Points for Year 2021, in absolute terms and as a percentage of the Technical Capacity.

ENTRY POINT	Technical Capacity [kWh/Day]	Maximum Booked Transmission Capacity at Point [kWh/Day]	Maximum Booked Transmission Capacity at Point as a percentage of Technical Capacity [%]
SIDIROKASTRO(1)	117,804,036	158,504,036	135%
AGIA TRIADA	204,481,800	204,481,800	100%
KIPI	48,592,292	38,000,000	78%
NEA MESIMVRIA	53,368,256	33,346,301	62%
EXIT POINT	Technical Capacity [kWh/Day]	Maximum Booked Transmission Capacity at Point [kWh/Day]	Maximum Booked Transmission Capacity at Point as a percentage of Technical Capacity [%]
ALOYMINION	26,714,340	17,500,000	66%
ALOYMINION II	20,723,593	18,500,000	89%
ALOYMINION III	6,678,585	2,100,000	31%
MOTOR OIL	26,714,340	13,500,000	51%
MOTOR OIL II	21,371,472	18,000,000	84%
AG. THEODOROI	2,992,197	230,000	8%
ATHENS	101,876,740	41,572,732	41%
ALEXANDROUPOLIS	7,480,015	139,000	2%
ALIVERI (PPC)	21,371,472	19,008,000	89%
VIPE LARISSA	2,671,434	317,600	12%
VOLOS	13,796,086	6,876,839	50%
VFL	6,493,989	5,120,000	79%
DRAMA	7,480,015	1,008,102	13%

ELPE	4,815,794	2,500,000	52%
ELPE-VEE	12,756,552	12,756,551	100%
ELPE-HAR	8,014,302	7,500,000	94%
ENERGIAKI THESS. (ELPE)	26,714,340	16,000,000	60%
HERONAS	10,685,736	7,000,000	66%
HERON II	22,441,482	18,000,000	80%
THESSALONIKI	77,501,024	38,681,391	50%
THISVI	23,738,101	16,000,000	67%
KAVALA	2,671,434	13,000	0%
KARDITSA	5,342,868	2,181,023	41%
KATERINI	7,480,015	444,095	6%
KERATSINI (PPC)	27,289,500	0	0%
KILKIS	11,754,309	2,010,328	17%
KOKKINA	2,671,434	292,029	11%
KOMOTINI (PPC)	28,851,488	21,900,000	76%
KOMOTINI	5,342,868	269,201	5%
KOSMIO	12,159,840	2	0%
LAMIA	7,480,015	178,226	2%
LARISSA	13,843,371	8,954,426	65%
LAVRIO (PPC)	64,114,418	42,855,000	67%
MEGALOPOLIS (PPC)	42,742,945	32,486,000	76%
SPATA	3,072,149	649,535	21%
XANTHI	11,754,309	253,636	2%
OINOFYTA	11,836,679	4,201,589	35%
PLATY	5,740,377	311,002	5%
SALFA ANO LIOSSIA	2,671,434	320,000	12%
SALFA ANTHOUSSA	1,371,600	158,000	12%
SERRES	11,754,309	1,485,265	13%
TRIKALA	5,342,868	2,001,423	37%
FARSALA	1,870,003	230,248	12%
REVERSE FLOW EXIT POINT	Technical Capacity [kWh/Day]	Maximum Booked Transmission Capacity at Point [kWh/Day]	Maximum Booked Transmission Capacity at Point as a percentage of Technical Capacity [%]
SIDIROKASTRO	64,826,100	60,250,008	93%

Table 7

Comments on Table 7:

1. The percentage of the Entry Point 'SIDIROKASTRO' was calculated based on the sum of the Technical Capacity of the specific Point on the Day of its Maximum Booked Transmission Capacity and the maximum of the sum of the Additional and the Interruptible Transmission Delivery Capacity, booked by the Transmission Users in the Year 2021.

2.7 Emergencies and Dealing with Emergencies

During the Year 2021 there was no Crisis in the National Natural Gas System, as defined in the current Emergency Plan (Government Gazette 2501/B/25.06.2019), in accordance with Articles 8 and 10 of Regulation (EU) 2017/1938 of the European Parliament and of the Council of 25 October 2017 concerning measures to safeguard the security of gas supply and repealing of Regulation (EU) 994/2010, as well as those referred to in Chapter 10 of the NNGS Network Code.

2.8 Operating characteristics of the NNGS

The Minimum Inlet Pressure at Entry Points 'SIDIROKASTRO', 'KIPI' and 'NEA MESIMVRIA' is 47.75 barg, 50 barg and 50 barg, respectively. Diagram 3 below shows the average Daily Inlet Pressure at the NNGTS Entry Points 'SIDIROKASTRO', 'KIPI', 'AGIA TRIADA' and 'NEA MESIMVRIA' for the Year 2021.

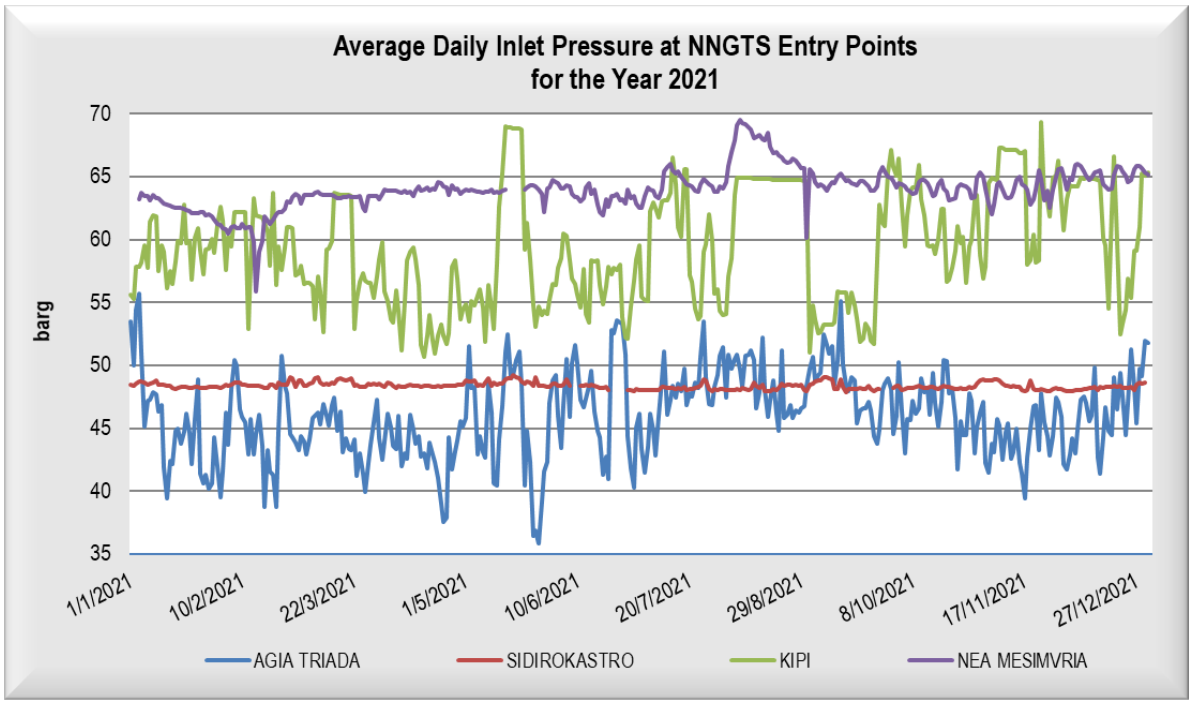

Diagram 3

Furthermore, Diagram 4 shows the average Daily Network Pressure of the NNGTS for the Year 2021, as calculated by data recorded by DESFA's SCADA system.

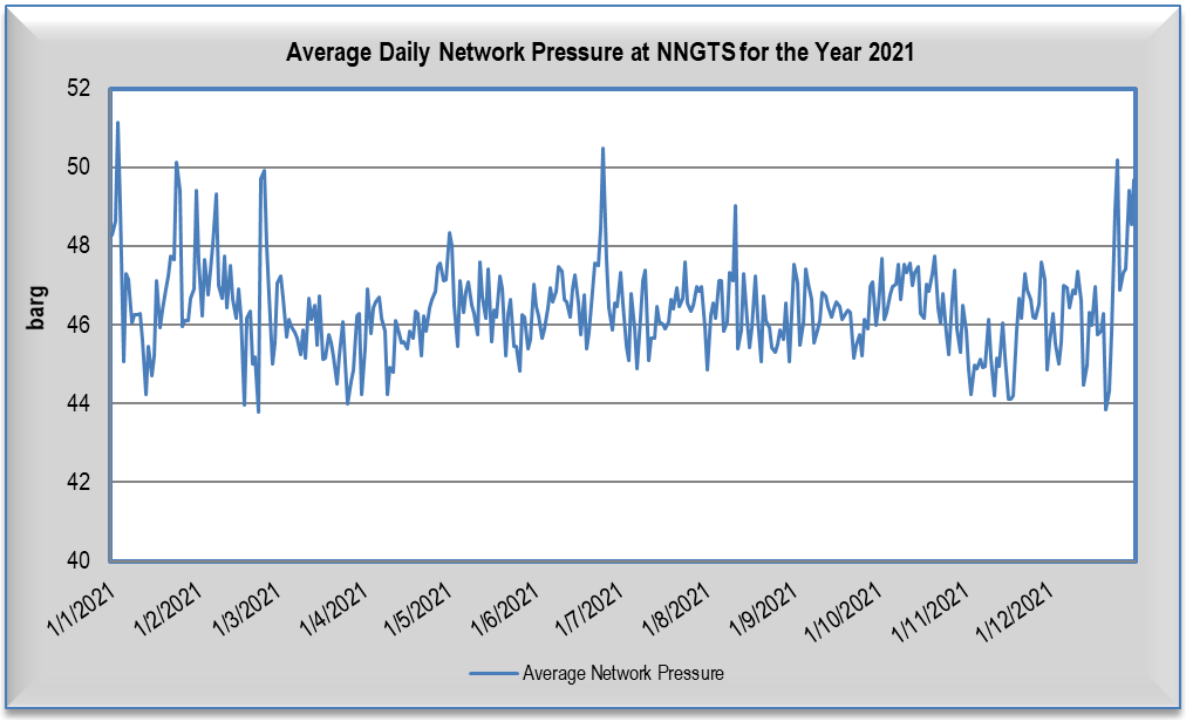

Diagram 4

2.9 Natural Gas Quantities historical data

2.9.1 Daily Natural Gas Deliveries/Off-takes

During the Year 2021 the total Natural Gas Off-takes at the NNGTS Exit/ Reverse Flow Exit Points was 77,559 mil. kWh (compared to 70,474 mil. kWh during the Year 2020). Diagram 5 shows the Daily Natural Gas Off-Takes at the NNGTS Exit/Reverse Flow Exit Points, as a sum, for the Year 2021. It is worth mentioning that the maximum amount of the Natural Gas Off-Takes at the NNGTS Exit/Reverse Flow Exit Points for the Year 2021 was recorded on the Day 21.12.2021, i.e. 362,757,654 kWh.

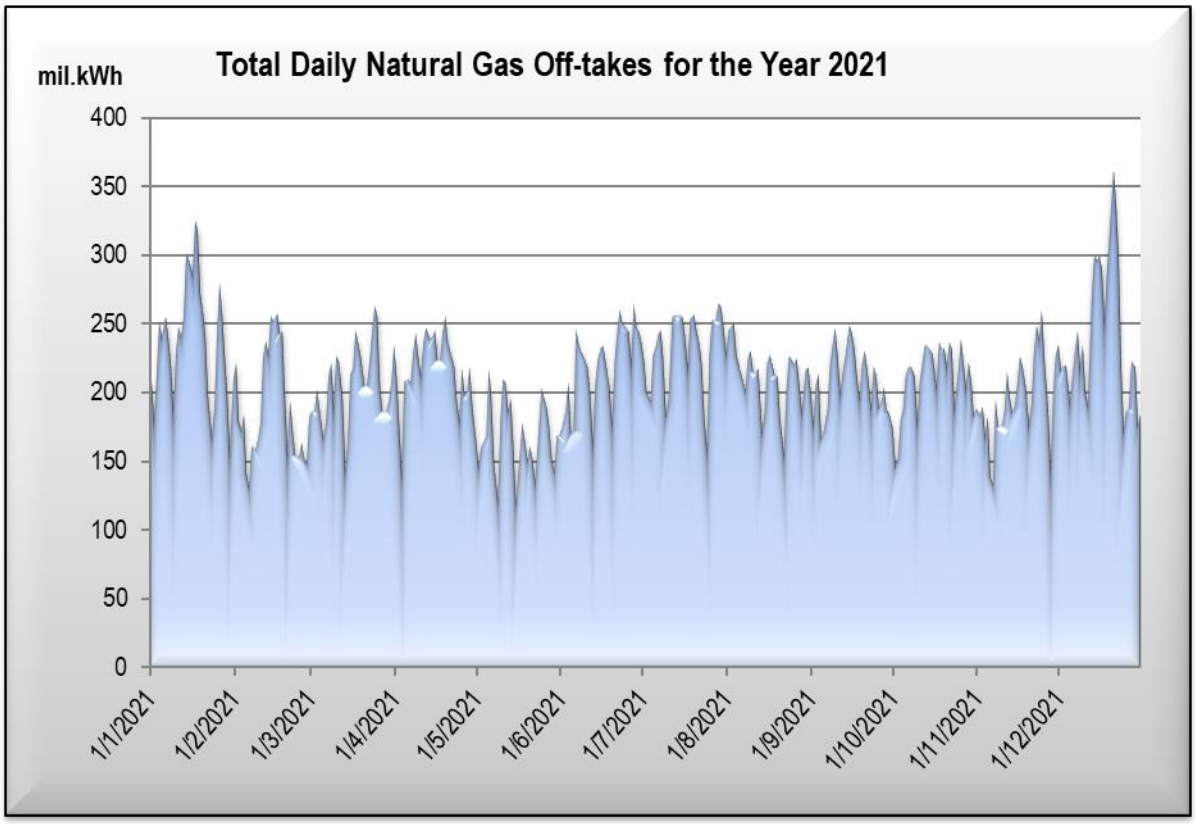

Diagram 5

During the Year 2021 the total Natural Gas Deliveries at the NNGTS Entry Points was 77,734 mil. kWh (compared to 70,649 mil. kWh during the Year 2020). Diagram 6 below shows the shares of Natural Gas Delivery quantities per NNGTS Entry Point for the Year 2021.

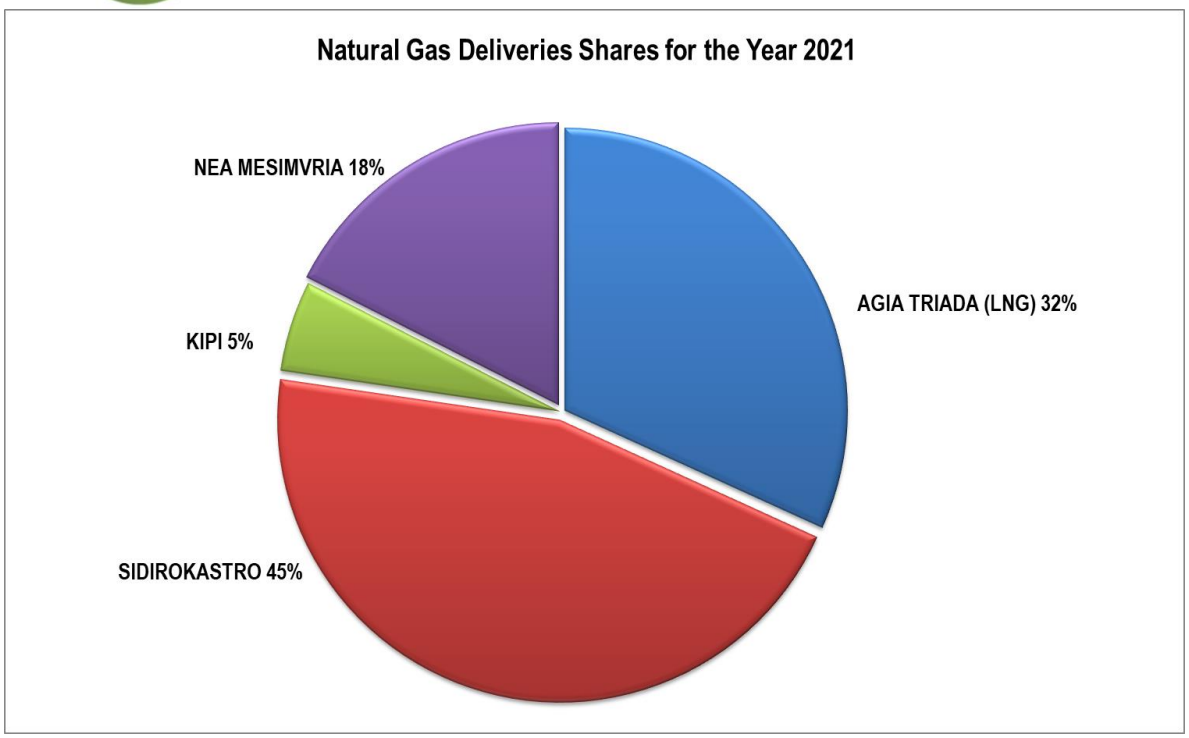

Diagram 6

2.9.2 Daily Natural Gas Quantity stored in the network of NNGTS

The Daily Natural Gas quantity stored in the NNGTS (i.e. Line Pack) varied from 22,252,563 Nm^3 (Day 23.02.2021) to 26,300,692 Nm^3 (Day 04.01.2021). Diagram 7 below shows the Daily variation of the NNGTS Line Pack, as well as the delimitation of the Line Pack for the Year 2021, according to which the Operator performs Balancing Actions so that at the end of a Day, the Line Pack is aimed within the range [22.3 - 24.3] million Nm3, in order to ensure the cost-effective and efficient operation of the NNGTS during the Day without violating the functional limits of the NNGTS within the Day.

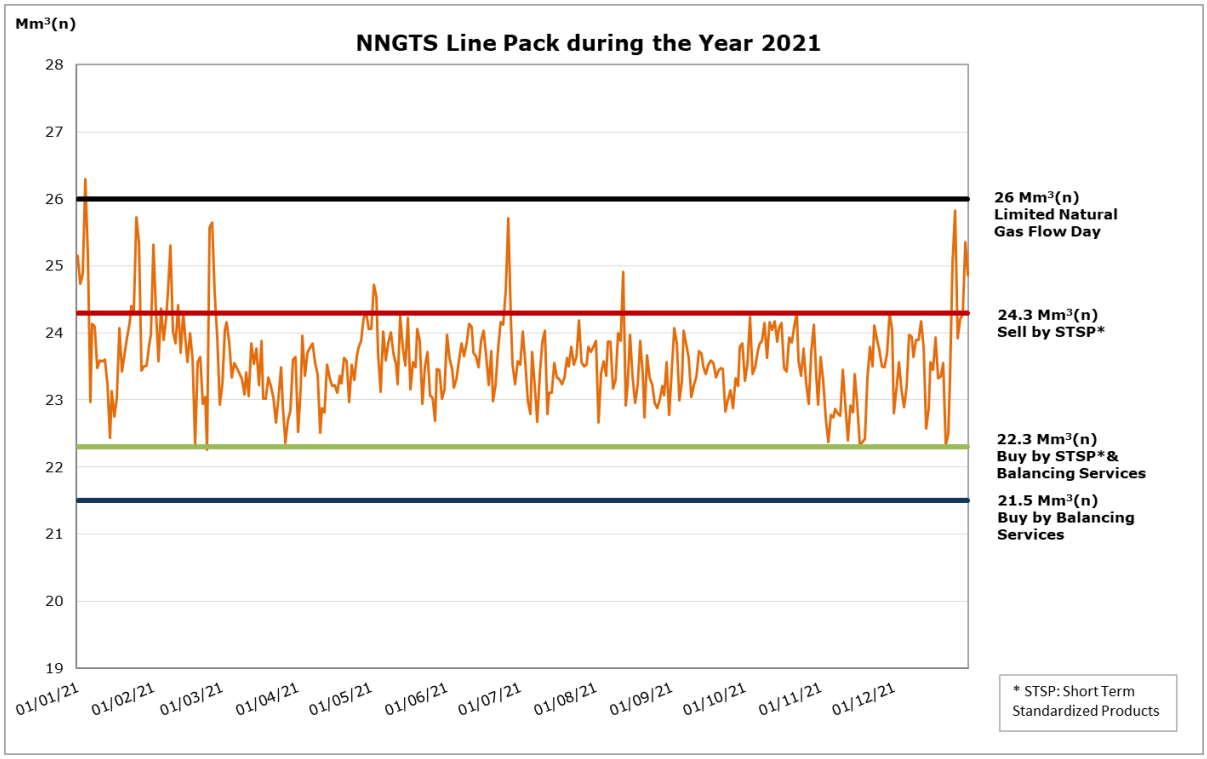

Diagram 7

2.9.3 Total Daily LNG Stock

Through the Entry Point 'AGIA TRIADA' 24,722 mil. kWh of Natural Gas were injected into the NNGTS (compared to 32,627 mil. kWh during the Year 2020), while the LNG unloads led to 24,515 mil. kWh (compared to 33,405 mil. kWh during the Year 2020).

Diagram 8 on the next page shows the Daily configuration of the total LNG stock, including the Balancing Gas that DESFA stored for performing balancing services, during the Year 2021.

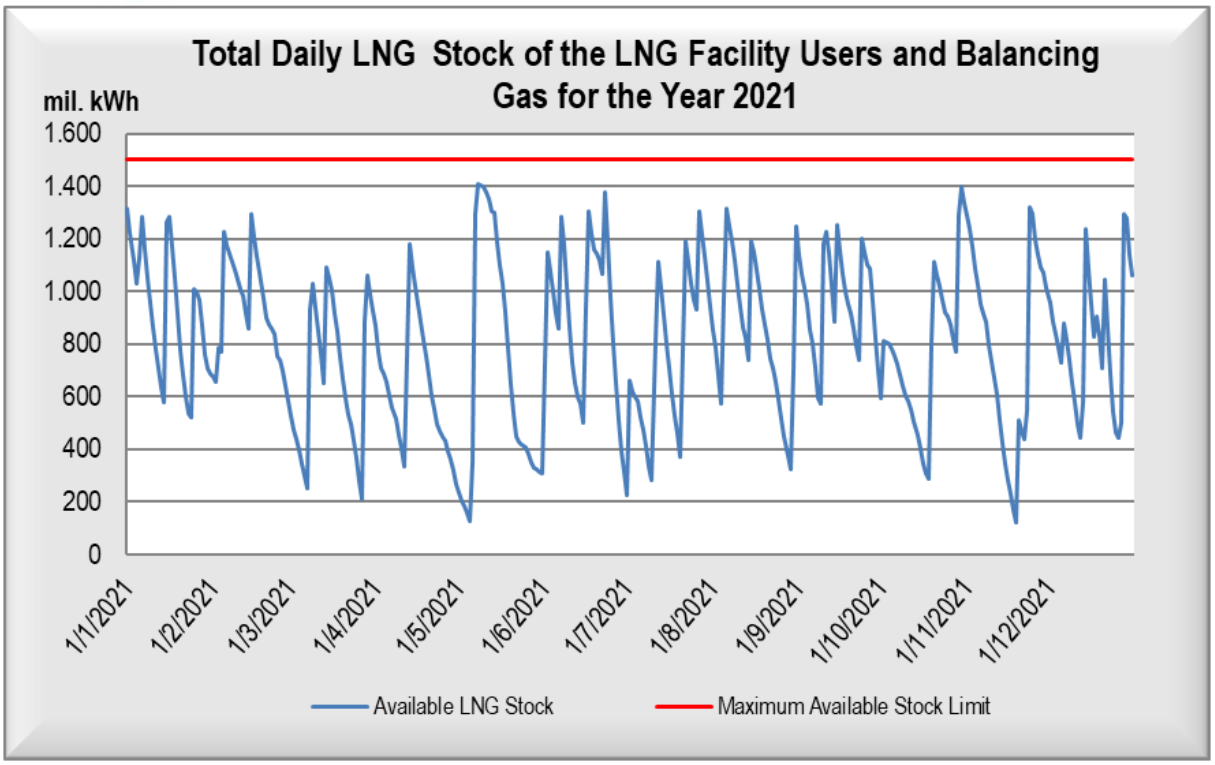

Diagram 8

2.9.4 Historical Operational data of the Compression Station in Nea Mesimvria

The Compression Station in Nea Mesimvria, Thessaloniki, consumed 108,566,106 kWh of Natural Gas as fuel during the Year 2021. The amount corresponds to 92% of the total Operational Gas that was used in the NNGTS during the Year 2021, which amounts to 117,487,639 kWh.

Diagram 9 on the next page shows the Operational Gas used in the NNGTS and the Natural Gas consumed as fuel for the operation of the Compression Station on a Monthly basis during the Year 2021.

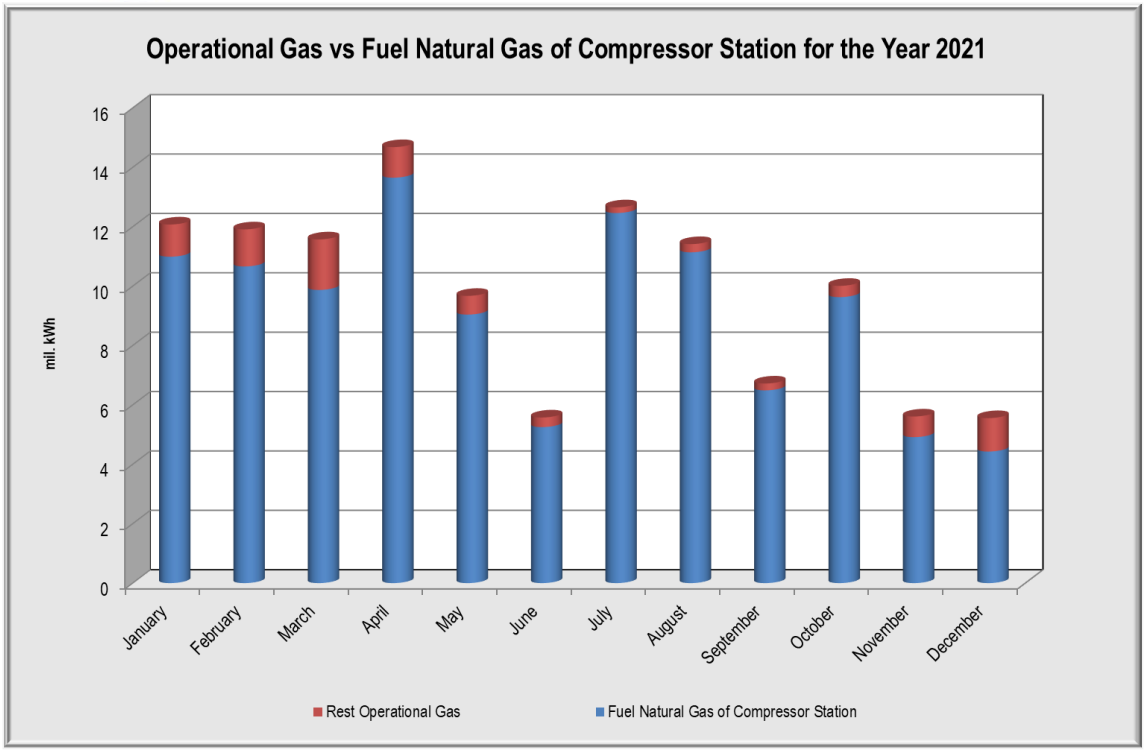

Diagram 9

Diagram 10 below shows the Natural Gas quantity that was handled by the Compression Station on a Monthly basis during the Year 2021.

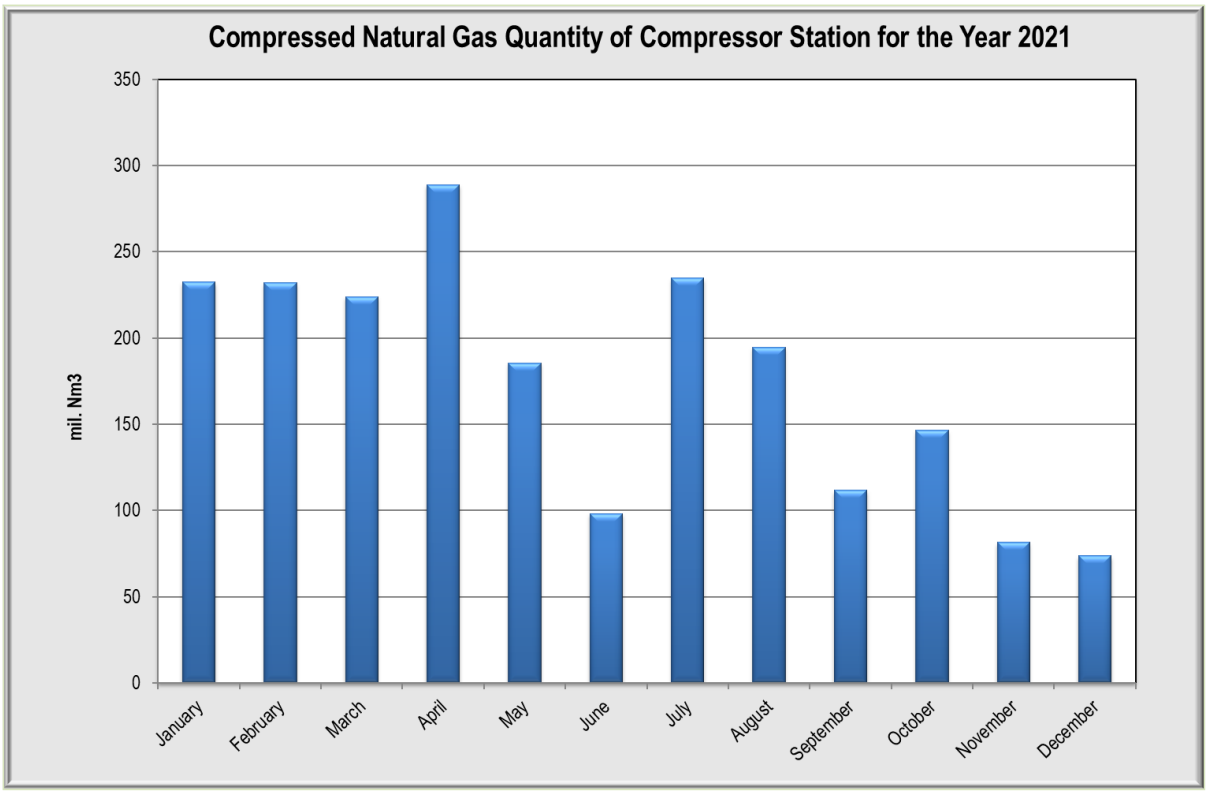

Diagram 10

2.9.5 Natural Gas out of specifications during the Year 2021

During the Year 2021, there was no average Daily Delivery Pressure lower than the Minimum Entry Pressure at any of the NNGTS Entry Points.

Finally, during the Year 2021, there was one incident where the Natural Gas was out of the quality specifications, as these are specified in Annex I of the NNGS Network Code, and concerned the temperature of the Natural Gas off-taken at the "TRIKALA" Exit Point for one (1) Day.