DESFA
Hellenic Gas Transmission System Operator S.A.

Draft NNGS Development Plan 2021-2030

July 2020

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ABBREVIATIONS

BCC: Back up Control Center
Bcma: Billion cubic meter per annum
BMS: Boarder Metering Station
CCTV: Closed Circuit Television
CHP: Combined Heat and Power unit
CNG: Compressed Natural Gas
DCS: Distributed Control System
DESFA: TSO of the Greek Natural Gas System
EIB: European Investment Bank
GCC: Gas Control Center
HP: High Pressure
IGB: Interconnector Greece Bulgaria

IISNG: Integrated IT System for Natural Gas
INGS: Integrated Natural Gas System
L/V: Linevalve
LNG: Liquefied Natural Gas
M/R: Metering/Regulating
NNGS: National Natural Gas System
NNGTS: National Natural Gas Transmission System
NSRF or PA: National Strategic Reference Framework or Partnership Agreement 7-year E.U. program for the support of the Greek economy
O&M Centers: Centers of Operation and Maintenance
P/P: Power Producer
PLC: Programmable Logic Controller
RAB: Regulated Asset Base
RAE: Regulatory Authority of Energy
REM: Remote
RTU: Remote Terminal Unit
SCADA: Supervisory Control and Data Acquisition
TAP: Trans Adriatic Pipeline
TDM/PDH: Time Division Multiplexing/ Plesiochronous Digital Hierarchy
TSO: Transmission System Operator
Nm^3: Normal Cubic meter
TM: Tele-metering

Chapter I. Introduction

Present Development Plan is conducted in accordance with applicable legislation namely article 14 of L. 4001/2011 and applicable provisions of NNGS Network code.

For the preparation of the Development Plan, the Development Study is taken into consideration as well as:

a) data of the current and the estimated supply and demand of natural gas
b) the fulfillment of obligations to provide public utility services and gas supply security, aiming at the continuity of supply and prevention of congestions and of refusal of access for new users, in a reliable and economically efficient manner
c) the continuous improvement of the NNGS safety, reliability and efficiency, aiming at the prevention of incidents, failures and emergencies, in a reliable and economically efficient manner
d) the supply of new areas with natural gas and the ensuring of new Users' potential access
e) the protection of the environment, also by expanding the use of natural gas as an alternative, cleaner and more sustainable fuel in maritime and road transportation
f) the European development plan and the regional investment programs in accordance with the provisions of part (b) of paragraph 3 of Article 8 and of paragraph 1 of Article 12 of Regulation 715/2009
g) the viability of projects that are included in the Plan and their potential financing.

The Development Plan includes projects whose construction is scheduled to begin within the timeframe of the Plan (i.e. for the period 2021-2030) as well as the Planned Projects whose construction has not been completed yet.
The TSO substantiates the feasibility of the inclusion of the new projects in the Development Plan and includes information about the construction method, the estimated budget, the time schedule of the implementation, the way of financing the relevant investments as well as the cost recovery method.
In the following paragraphs the projects of the Development Plan of 2021-2030 are presented, including for each project all the necessary elements arising from the Network Code for the regulation of NNGS.

The Development Plan is structured as follows:

I. Projects included in the three years Development Period
A. New Pojects
   i. Projects for the interconnection of NNGS with other interconnected systems (connection/development projects)
   ii. Projects for the connection of Users
   iii. Development Projects: Expansion of NNGS to new areas or markets
   iv. Development Projects: Increase of capacity & security of supply of NNGS
   v. Development Projects: Improvement / modernization/ maintenance of NNGS
B. Planned Projects

i. Projects for the interconnection of NNGS with other interconnected systems (connection/development projects)
ii. Projects for the connection of Users
iii. Development Projects: Expansion of NNGS to new areas or markets
iv. Development Projects: Increase of capacity & security of supply of NNGS
v. Development Projects: Improvement / modernization/ maintenance of NNGS

II. Projects outside the three years Development Period

A. New Projects

i. Projects for the interconnection of NNGS with other interconnected systems (connection/development projects)
ii. Projects for the connection of Users
iii. Development Projects

B. Planned Projects

i. Projects for the interconnection of NNGS with other interconnected systems (connection/development projects)
ii. Projects for the connection of Users
iii. Development Projects

III. Projects that are not included in the Development Plan 2021-2030

The TSO is duly justifying in the Development Plan any reasons for not including any planned project. It is mentioned at this point that according to Article 5A par. 8 of the Tariff Regulation (RAE Decision 539/2019), the Development Projects that are defined as Projects of Major Importance are eligible for an increased return.

For each project a summary table of the following information is given, as presented below:

- the type of project (Planned or New Development or Connection))
- the type of investment (pipeline, compressor station, metering station, LNG and small scale LNG facilities, CNG facilities, including all related plants, machineries, devices, equipment and systems for process monitoring/supervision/control/management and ancillary facilities such as consolidation/protection works, service roads, buildings, offices, IT systems, etc.)
- the expected benefit (according to the criteria of art. 92 par. 2 of NNGS Network Code)
- the current status:
  - under preliminary study, which includes preliminary market analysis, dimensioning and cost estimation that will allow the definition of the project for approval by RAE
  - under maturity, which includes basic design study, environmental authorization and possibly procedure for award of the construction, that is all the actions from approval by RAE up to the Final Investment Decision (i.e. Resolution to Construct) according to the definition of the NNGS Administration Code
  - under construction, which includes the detailed design, procurement of materials and construction of the project as well as any tests following mechanical completion, that

are all the actions from the Final Investment Decision (i.e. Resolution to Construct) and up to inclusion of the project in the system

- the project milestone dates:
  - the start date, which is the first inclusion of the project to the Development Plan or List of Small Projects
  - the date of Final Investment Decision, as this term described in the NNGS Network Code, i.e. "*the approval decision for the implementation of the project by the Operator without technical, commercial or financial conditions*. *The FID is taken after (a) the approval of the Development Plan or the publication of the Small Projects List, in which it is included, (b) the execution of Connection Agreement for the Connection Projects, (c) the financing decisions, at least in relation to own capital and grants and (d) the approval of Environmental Terms. Contracts for procurement of materials and construction of projects are executed by the Operator after the taking of the FID*" (art. 1 par. 66 of the Network Code).
  - the estimated Operation Date, as described in the NNGS Network Code, which is the starting date of operation (for testing if necessary) after the mechanical completion of the project
  - the scheduled day for Entry into System, which is the start of normal operation (or Commercial Operation Date). Entry of a project into the system is performed after the issuance of operation license, where relevant.
- the current budget of the project, as well as the part of which is considered maintenance capex. *Maintenance capex is considered to be any addition to or replacement of existing NNGS assets in order the latter to be maintained in their initial operational capability as long as possible.*
- for new projects their impact on the Average NNGS Tariff is calculated, as described and provided for in the Tariff Regulation
- the financing plan and the recovery method of the investment are presented for each project.
- whether a commitment with a User has been made for booking of Transmission Capacity for a certain period of time
- whether the project is part of the three-year Development Period provided for in the respective NNGS Network Code. This period includes projects which the final Investment Decision (i) has been taken, or (ii) is considered possible to be taken within three (3) years from the publication of the draft Development Plan in DESFA's website (i.e. up to July 2023). For projects not included in the 3-year Development Period, no planning is given.

Project Summary	
Type of project	
Type of investment	
Current Budget	
of which Maintenance Capex	

Expected benefit	
Start date	
Final Investment Decision	
Operation Date	
Entry in the system	
Current Status of Project	
Financing plan	
Recovery method	
Connection Agreement with User	
Impact on the Average Tariff for the use of NNGS (for "new" projects only)	
Inclusion in the 3 year Development Period	

Following the project summary of each project, a short description of the scope of it and any other necessary relevant information is given.

Compliance of NNGS Development Plan with ENTSOG's Ten-Year Development Plan (TYNDP) and Gas Regional Investment Plan (GRIP)

In compliance with Regulation 715/2009/EC Transmission System Operators are obliged to establish a regional cooperation in the framework of European Network of Transmission System Operators for Gas (ENTSO-G). Specifically, the TSO publishes every two years a non-binding ten-year network development plan (TYNDP), as well as the gas regional investment plan (GRIP).
The purpose of these documents is to provide information to stakeholders about the new projects that will create opportunities for transporting natural gas in each country.
DESFA has taken into consideration the TYNDP 2020 under preparation as well as the Southern Corridor GRIP 2018-2027 under finalization.

Chapter II. Projects included in the three years Development Period

A. New Projects

A1. Projects for the interconnection of NNGS with other interconnected systems (connection/development projects)

There are no new projects for the interconnection of the NNGS with other interconnected systems.

A2. Projects for the connection of Users

There are no new projects for the connection of the NNGS with Users' installations.

A3. Development Projects: Expansion of NNGS to new areas or markets

1. High Pressure pipeline to West Macedonia

Project Summary	
Type of project	New Project
Type of investment	Pipeline & M/R station
Current Budget	110 million €
Expected benefit	the supply of new areas with natural gas and the ensuring of new Users' potential access
Start date	July-20
Final Investment Decision	Mar-21
Operation Date	Aug-23
Entry into the system	Sep-23
Current Status of Project	Under preliminary study
Financing plan	DESFA's own equity or loan, possible grant
Recovery method	Inclusion in the RAB of Transmission System (w/o possible grants)
Impact on the Average Tariff for the use of NNGS (for "new" projects only)	0-2,1% (w/o grants) 0-0,34 % (with 50% grant)
Inclusion in the 3 year Development Period	Yes

The project is included to support the decarbonization policy introduced by the Hellenic Republic and it concerns the extension of the existing NGTS via a new pipeline branch up to the region of West Macedonia. According to the preliminary routing, the pipeline starts from the area of the existing Line Valve Station (LVS) at Trikala Imathias and will have a length of about 130km, out of which 102km with diameter of 30'' and apr29 km with diameter of 10''.
The project includes a Metering & Regulating station to supply the district heating installations, as well as line valves to supply other consumption in the region. It will also include connection to the M/R stations of Aspros and Perdikas (already planned projects to be supplied from TAP pipeline until construction of this pipeline).
Another benefit of this pipeline will be the connection of the NNGS with an area where production of hydrogen is planned (White Dragon project), therefore it will initiate actions for adaptation of the NNGS to carry hydrogen (first as blend with natural gas).
The potential market of the region is not fully identified yet; in the best (but realistic) scenario there will be no impact on the Average NNGS Tariff. In the lowest scenario, the impact will be an increase of about 2,1 %. In the case grants are approved the above impact may be decreased significantly.

2. High Pressure Pipeline to Patras

Project Summary	
Type of project	New Project
Type of investment	Pipeline & M/R Station
Current Budget	85,0 million €
Expected benefit	the supply of new areas with natural gas and the ensuring of new Users' potential access
Start date	Jul -20
Final Investment Decision	Dec -21
Operation Date	Dec -24
Entry in the system	Mar -25
Current Status of Project	Under preliminary study
Financing plan	DESFA's own equity or loan, grant (assumed at the level of 50%)
Recovery method	Inclusion in RAB of Transmission Services (w/o possible grants)
Impact on the Average Tariff for the use of NNGS (for "new" projects only)	2,1 % (w/o grant) 0,86 % (with 50% grant)
Inclusion in the 3 year Development Period	Yes

In line with relative request of the Western Greece Region, the project concerns the connection of the city of Patra and the Industrial Area (VIPE) of Patras with the NNGS, with the possibility of future extensions to supply also other cities of the Region of Western Greece (e.g. Pyrgos, Agrinio).
According to preliminary design, the project consists of a 16" high pressure pipeline, of approximately 140 km, which will start from a suitable point on the high pressure pipeline to Megalopolis. The project also includes two metering and regulating stations.
An application for grant will be submitted under the NSRF 2021-2027. The project will be constructed after the approval of grant.
DESFA will coordinate with the Distribution System Operator who will undertake the development of the distribution network in the region.

3. Korinthos M/R city gate station

Project Summary	
Type of project	New Project
Type of investment	M/R Station
Current Budget	2 million €
Expected benefit	Enabling access to new Users
Start date	Jul -20
Final Investment Decision	Oct-20
Operation Date	Oct-22
Entry in the system	Oct-22
Current Status of Project	Under preliminary study
Financing plan	DESFA's own equity or loan
Recovery method	Inclusion in RAB of Transmission Services
Impact on the Average Tariff for the use of NNGS (for "new" projects only)	0,01%
Inclusion in the 3 year Development Period	Yes

The investment consists of one Metering Regulating city gate station at the area of Korinthos including building construction and installation (M/R Control Building), construction of Metering and Regulating skid, construction of auxiliary installations, construction of steel shelter for the protection of M/R skid (Skid Shelter), as well as connection with the existing NNGTS pipeline.
Construction of the project will be awarded following coordination with the Distribution System Operator who will undertake the development of the distribution network in the city of Korinthos.

4. Argos/Nafplio M/R city gate station

Project Summary	
Type of project	New Project
Type of investment	M/R Station
Current Budget	2,2 million €
Expected benefit	Enabling access to new Users
Start date	Jul -20
Final Investment Decision	Oct-20
Operation Date	Oct-22
Entry in the system	Oct-22
Current Status of Project	Under preliminary study
Financing plan	DESFA's own equity or loan
Recovery method	Inclusion in RAB of Transmission Services
Impact on the Average Tariff for the use of NNGS (for "new" projects only)	0,02%
Inclusion in the 3 year Development Period	Yes

The investment consists of one Metering Regulating city gate station including building construction and installation (M/R Control Building), construction of Metering and Regulating skid, construction of auxiliary installations, construction of steel shelter for the protection of M/R skid (Skid Shelter), as well as connection with the existing NNGTS pipeline.
Construction of the project will be awarded following coordination with the Distribution System Operator who will undertake the development of the distribution network in the cities of Argos and Nafplio.

5. Tripoli M/R city gate station

Project Summary	
Type of project	New Project
Type of investment	M/R Station
Current Budget	2 million €
Expected benefit	Enabling access to new Users
Start date	Jul -20

Final Investment Decision	Oct-20
Operation Date	Oct-22
Entry in the system	Oct-22
Current Status of Project	Under preliminary study
Financing plan	DESFA's own equity or loan
Recovery method	Inclusion in RAB of Transmission Services
Impact on the Average Tariff for the use of NNGS (for "new" projects only)	0,01%
Inclusion in the 3 year Development Period	Yes

The investment consists of one Metering Regulating city gate station at the area of Tripolis including building construction and installation (M/R Control Building), construction of Metering and Regulating skid, construction of auxiliary installations, construction of steel shelter for the protection of M/R skid (Skid Shelter), as well as connection with the existing NNGTS pipeline.
Construction of the project will be awarded following coordination with the Distribution System Operator who will undertake the development of the distribution network in the city of Tripolis.

A4. Development Projects: Increase of capacity & security of supply of NNGS

There are no new development projects that aim to increase the capacity & security of supply of the system.

A5. Development Projects: Improvement / modernization/ maintenance of NNGS

There are no new development projects that aim to contribute to the improvement, modernization or maintenance of the NNGS.

A6. Impact of the Development projects in the Average Tariff for the Use of the system of NNGS

It is estimated that the inclusion in the RAB of the above projects increases the Average Tariff for the usage of NNGS to 4,2% considering no grants and a low market scenario for West Macedonia region. With a higher market scenario for West Macedonia, that is assumed to be probable considering the possible evolution of natural gas demand induced by the de-carbonization of the region - the impact will be reduced to 2,1%. Nevertheless, the benefits achieved from the above mentioned projects would be important and decisive for the economy, the environment and the quality of life for the new regions concerned.

B. Planned Projects

B1. Projects for the interconnection of NNGS with other interconnected systems (connection/development projects)

1. M/R Station in N. Messimvria for the Connection of NNGTS to TAP

Project Summary	
Type of project	Planned Project
Type of investment	Pipeline, Metering Station
Current Budget	12 million €
Expected benefit	Security of supply, enhancement of competition
Start date	19-Jul-07[1]
Final Investment Decision	Taken
Operation Date	Oct-20
Entry in the system	Dec-20
Current Status of Project	Under construction
Financing plan	INEA Grants (for studies), NSRF 2014-2020 grants[2], DESFA's own equity or loan
Recovery method	Inclusion in RAB of the Transmission Services
Inclusion in the 3 year Development Period	Yes

According to the provisions of the paragraph 4.7.4 of Joint Decision of Greek, Albanian and Italian Regulators for the exemption of TAP from articles 9, 32, 41(6), (8) and (10) of Directive 2009/73/EC (Decision of RAE 269/2013 Gov. Gaz. 1833/29.07.2013) at least one (1) Tie-In Point between NNGS and TAP pipeline should be realized, with a nominal flow design of 10 mil. Nm^3/ day and bi-directional flow capability. The cost of construction of the above mentioned investment, based on the exemption decision, will be covered by DESFA and will be recovered through the tariffs of the Users of the National Natural Gas System.

[1] Approval time for the basic design
[2] Approved to the level of 59% of the eligible cost.

The budget of the project is 12 million € and includes a) engineering-procurement-construction of the Metering/Regulating station b) engineering-procurement-construction of a small connecting pipeline between the two systems c) purchase of land for the M/R station and compressor station in next future.

With this investment, the uni-directional flow from TAP to NNGTS is secured (1st phase of the project) as well as the land acquisition where the compressor station will be installed in the future, enabling full bi-directional flow in the interconnection. In order to enable firm entry capacity into the Greek system, the completion of the planned project of the new compressor station of Ambelia is needed, while for the firm exit capacity, the planned project of the new booster compressor station of Nea Messimvria is needed.
The project is included in the 4th PCI list of 2019. The FEED study was co-financed from Connecting Europe Facility (CEF), while the construction of the project is co-financed from NSRF 2014-2020.

2. Pipeline Nea Messimvria – Evzonon/ Gevgelija and Metering station

Project Summary	
Type of project	Planned Project
Type of investment	Pipeline, Metering station
Current Budget	51,4 million €
Expected benefit	Development SEE market, increase of usage of NNGS
Start date	Jun-17
Final Investment Decision	Dec-20[3]
Operation Date	Nov-23
Entry in the system	Dec-23
Current Status of Project	Under maturity
Financing plan	EIB loan[4], DESFA's own equity or other loan
Recovery method	Inclusion in RAB of Transmission Services
Inclusion in the 3 year Development Period	Yes

The project aims at the interconnection of natural gas transmission systems of Greece and North Macedonia which will enhance the diversification of supply sources for North

[3] Conditional to sufficient booking of capacity.
[4] Application submitted for 50% of the budget.

Macedonia. The latter one is currently solely dependent on the supply of gas from Trans Balkan Pipeline.
DESFA and NER have signed a Memorandum of Understanding for the project in October 2016.
Access to NNGS, and especially to the LNG terminal of Revithoussa and to natural gas through TAP pipeline, can benefit market competition thus leading to lower prices for the supply of natural gas in the neighboring country. Meanwhile the project enhances the regional development of natural gas market and the involvement of more market players thus enhancing the role of Greece as a hub. Furthermore, it will lead to the increased usage of infrastructure such as the LNG terminal in Revithoussa, in order to reduce the tariffs for the usage of the transmission system in the long term.

The required project within Greece is constituted from:

-A 57 km pipeline of 30 in with 70 barg design pressure and 66.4 barg maximum operating pressure starting from Nea Messimvria (downstream of the current compressor station) an ending to the Border Station U-7550 which belongs to the Administrative limits of the Community of Evzoni, eastern of river Axios.

-A Metering Station, two (2) Scraper Stations, Launcher and Receiver.

The project is in the phase of completing the basic design, while the environmental terms have already been approved.

Picture 1 - Routing of the pipeline from Nea Messimvria to the border with North Macedonia

The project will be implemented after the completion of the market test and the signing of a cooperation agreement with NER that will include the steps to be followed by both Parties for the implementation of the interconnection and will detail the responsibilities and liabilities of each Party.

3. Interconnection of IGB Pipeline with the NNGS in Komotini

Project Summary	
Type of project	Planned Project
Type of investment	Valve station
Current Budget	0,35 million €

Expected benefit	Interconnection with n.g. system
Start date	Dec-19
Final Investment Decision	Sep-20
Operation Date	May-21
Entry in the system	Jul-21
Current Status of Project	Under maturity
Financing plan	DESFA's own equity or loan
Recovery method	Inclusion in RAB of Transmission Services
Inclusion in the 3 year Development Period	Yes

The Project is consisting of the following sub-project parts:

(a) Modification of the existing 36'' pipe, which will interconnect (in the future) the NNGTS with the IGI pipeline system (stub-out section with a 36'' ball valve configuration)

(b) The installation of a 28'' Valve Station, including a 4'' by-pass configuration at the point of the interconnection of the NNGTS with the IGB pipeline system.

B2. Projects for the connection of Users

1. M station at SALFA A. Liossia

Project Summary	
Type of project	Planned Project
Type of investment	Metering station
Current Budget	0,68 million €
Expected benefit	Enabling access to new Users
Start date	Jun-17
Final Investment Decision	Taken
Operation Date	Dec-20
Entry in the system	Jan-21
Current Status of Project	Under construction
Financing plan	DESFA's own equity
Recovery method	Connection Fee
Connection Agreement with User	Yes

Inclusion in the 3 year Development Period	Yes

The project is developed according to the provisions of the Tariff Regulation as well as the relevant request and agreement with the Public Gas Corporation "DEPA SA".

2. M/R station AdG III

Project Summary	
Type of project	Planned Project
Type of investment	Metering & Regulating station
Current Budget	2 million €
Expected benefit	Enabling access to new Users
Start date	Apr-11[5]
Final Investment Decision	Taken
Operation Date	Dec -21
Entry in the system	Mar - 22
Current Status of Project	Under maturity (under preparation of the tender for the award of construction)
Financing plan	DESFA's own equity
Recovery method	Connection Fee
Connection Agreement with User	Yes
Inclusion in the 3 year Development Period	Yes

The construction of the new ADG III (U-2840) Measuring / Regulating Station (U-2840) in the area of Distomo Viotia includes the dismantling of the existing ADG III station (TM1 / TM5), the installation of the building infrastructure (RCC and Station Building), the construction of the M/R Station with a capacity of 23.500 Nm^3 / h with auxiliary installations (gas actuation systems) metal housing for the protection of the Metering skids (Skid Shelter) and connections to the existing ESD L/V (Emergency Shut Down) to supply the final consumer.

3. Connection of DEPA's CNG Station with the NNGTS in Komotini

Project Summary	
Type of project	Planned Project

[5] The Start date refers to the day of the signing of the Connection Agreement.

Type of investment	Metering station
Current Budget	1,3 million €
Expected benefit	Enabling access to new Users
Start date	Mar-18[6]
Final Investment Decision	Mar-21
Operation Date	Dec-22
Entry in the system	Mar-23
Current Status of Project	Under maturity
Financing plan	DESFA's own equity
Recovery method	Connection Fee
Connection Agreement with User	Not yet
Inclusion in the 3 year Development Period	Yes

The project refers to the installation of a Metering station for the supply of DEPA's CNG station at Komotini.
Construction of the project will be awarded after the signing of Connection Agreement with the applicant User.

4. Connection of DEPA's CNG Station with the NNGTS in Tripoli

Project Summary	
Type of project	Planned Project
Type of investment	Metering station
Current Budget	2,35 million €
Expected benefit	Enabling access to new Users
Start date	Mar-18[7]
Final Investment Decision	Mar-21
Operation Date	Dec-22
Entry in the system	Mar-23
Current Status of Project	Under maturity

[6] The Start date refers to the day of submission of the application for Advanced Reservation of Capacity.
[7] The Start date refers to the day of submission of the application for Advanced Reservation of Capacity.

Financing plan	DESFA's own equity
Recovery method	Connection Fee
Connection Agreement with User	Not yet
Inclusion in the 3 year Development Period	Yes

The project refers to the installation of a Metering station for the supply of DEPA's CNG station to Tripoli.
Construction of the project will be awarded after the signing of Connection Agreement with the applicant User.

5. Connection of Kavala Oil plant to the NNGTS

Project Summary	
Type of project	Planned Project
Type of investment	Pipeline/Metering station
Current Budget	3,4 million €
Expected benefit	Enabling access to new Users
Start date	Nov-18[8]
Final Investment Decision	May-21
Operation Date	Jul-22
Entry in the system	Dec-22
Current Status of Project	Under maturity
Financing plan	DESFA's own equity
Recovery method	Connection Fee
Connection Agreement with User	Not yet
Inclusion in the 3 year Development Period	Yes

The project will be implemented for natural gas supply of the KAVALA OIL plant. For this project a high pressure 6" pipeline, 2 km length approximately, including needed facilities (valve station, scraper station, hot tapping) and a Metering Station for the connection of KAVALA OIL plant with NNTGS. The project also includes land purchase for the valve station and scraper station.
Construction of the project will be awarded after the signing of Connection Agreement with the applicant User.

[8] The Start date refers to the day of submission of the application for Advanced Reservation of Capacity.

6. Metering station at Agios Nikolaos Viotia (AdG IV)

Project Summary	
Type of project	Planned Project
Type of investment	Metering station
Current Budget	1,87 million €
Expected benefit	Enabling access to new Users
Start date	Apr-18[9]
Final Investment Decision	Taken
Operation Date	Mar-23
Entry in the system	Apr-23
Current Status of Project	Under maturity (under the preparation of the tender for construction award)
Financing plan	DESFA's own equity
Recovery method	Connection Fee
Connection Agreement with User	Yes
Inclusion in the 3 year Development Period	Yes

The aim of this project is to install Metering Station in the greater area "Aluminium of Greece-ADG" industry, in order to supply with natural gas, the new installations "New C.C.G.T. Agios Nikolaos II". Project includes construction of Metering skids with capacity of 130.000 Nm^3/h, construction of auxiliary installations (gas actuation systems), construction of steel shelter for the protection of Metering skids (Skid Shelter), extension of the existing communication building (R.C.C.), as well as construction of new inlet and outlet Emergency Shut Down valve stations.

7. Connection of ELVAL plant to the NNGTS

Project Summary	
Type of project	Planned Project
Type of investment	Pipeline/Metering station
Current Budget	4 million €

[9] The Start date refers to the day of submission of the application for Advanced Reservation of Capacity.

Expected benefit	Enabling access to new Users
Start date	Dec-15[10]
Final Investment Decision	Feb-21
Operation Date	Sept-22
Entry in the system	Dec-22
Current Status of Project	Under maturity
Financing plan	DESFA's own equity
Recovery method	Connection Fee
Connection Agreement with User	Yes
Inclusion in the 3 year Development Period	Yes

The project will be implemented for natural gas supply of the ELVAL SA plant in Inofyta, Viotia, for various thermal uses. A new pipeline (extending the NNGTS), a scraper station (receiver) and a M / R station will be constructed for the supply of ELVAL plant.

8. Connection with TERNA Power Plant to the NNGTS

Project Summary	
Type of project	Planned project[11]
Type of investment	Pipeline / Metering station
Current Budget	3,22 million €
Expected benefit	Enabling access to new Users
Start date	Jun-20
Final Investment Decision	Dec-20
Operation Date	Nov-22
Entry in the system	Dec-22
Current Status of Project	Under maturity
Financing plan	DESFA's own equity
Recovery method	Connection Fee
Connection Agreement with User	Not yet
Inclusion in the 3 year Development Period	Yes

[10] The Start date refers to the day of submission of the application for Advanced Reservation of Capacity.
[11] Transferred from the Small Projects List

The project comprises construction of a new 1,5km pipeline that will be connected to the branch of ''Komotini-Alexandroupoli'' with the method of hot-tapping and construction of one-line valve station, construction of one Metering station with two metering skid, 1 working + 1 stand by, with capacity of 107.000 Nm^3/h, construction of central inlet and outlet Emergency Shut Down valve stations, and construction of one-line valve station as NNGTS exit point.
Construction of the project will be awarded after the signing of Connection Agreement with the applicant User.

9. Connection with ELPEDISON Power Plant to the NNTGS

Project Summary	
Type of project	Planned project[12]
Type of investment	Pipeline/ Metering station
Current Budget	2,16 million €
Expected benefit	Enabling access to new Users
Start date	Jun-20
Final Investment Decision	Jan-21
Operation Date	Sep-22
Entry in the system	Nov-22
Current Status of Project	Under maturity
Financing plan	DESFA's own equity
Recovery method	Connection Fee
Connection Agreement with User	Not yet
Inclusion in the 3 year Development Period	Yes

The aim of this project is to install one Metering Station at the west area of Thessaloniki in order to supply with natural gas the new Power Plant of ELPEDISON. The project comprises construction of a new 0,3km pipeline that will be connected to the branch of 'Pentalofos - Diavata'' with the method of hot-tapping, construction of one-line valve station, construction of one Metering station with two metering skid, 1 working + 1 stand by, with capacity of 130.000 Nm3/h and construction of central inlet and outlet Emergency Shut Down valve stations inside DESFA's property.
Construction of the project will be awarded after the signing of Connection Agreement with the applicant User.

[12] Transferred from the Small Projects List

B3. Development Projects: Expansion of NNGS to new areas or markets

1. Installation of M/R Kavala

Project Summary	
Type of project	Planned Project
Type of investment	Metering & Regulating Station
Current Budget	2,01 million €
Expected benefit	Supply of new areas
Start date	17-Oct-12
Final Investment Decision	July-20[13]
Operation Date	Sep-21
Entry in the system	Sep-21
Current Status of Project	Under maturity
Financing plan	DESFA's own equity or loan
Recovery method	Inclusion in RAB of Transmission Services
Inclusion in the 3 year Development Period	Yes

The project refers to the installation of an M/R 70/19 station in the area of Kavala line valve. The aim of the project is to supply the city of Kavala and the nearby cities of Palaio and Eleftheroupoli.

2. Truck Loading Pilot (first) Station

Project Summary	
Type of project	Planned Project
Type of investment	Small scale LNG facility
Current Budget	6,5 million €
Expected benefit	Supply of new areas/markets
Start date	Apr-16
Final Investment Decision	Taken

[13] Conditional to the approval of environmental terms

Operation Date	Sept -21
Entry in the system	Dec -21
Current Status of Project	Under construction
Financing plan	Poseidon Med II Grants (for studies), PA 2014-2020 grants[14], DESFA's own equity or loan
Recovery method	Inclusion in RAB of Additional LNG Services
Inclusion in the 3 year Development Period	Yes

The construction of a pilot truck loading station (the characterization of the station as pilot refers to the fact that will be the first station) will give the possibility for the use of natural gas in off grid areas, where the transmission system is not developed yet (e.g. islands and west Greece), along with its use in shipping for the fueling of vessels (for vessels using LNG as marine fuel). The result will be an increased gas consumption and a more efficient use of Revithoussa Terminal.

The market has already expressed interest for the said application both for the supply of off-grid consumers and for bunkering purposes. The station will have one loading bay for 50 m^3 trucks with a loading capacity of 100 m^3/h. It will also include provision for a future second bay.
The project also includes:

- Measurement of LNG loaded via weighbridge
- Control of the truck loading station from the LNG Terminal Control Room and DESFA SAP system for the issue of bill of lading and other required documentation
- Traffic arrangements within DESFA property as well as on the access road to Revithoussa
- Expansion of the existing jetty at Perama Megaridos port.

3. New jetty for small-scale LNG in Revithoussa

Project Summary	
Type of project	Planned Project
Type of investment	Small Scale LNG facility
Current Budget	20,4 million €
Expected benefit	Supply of new areas/markets

[14] Approved with 57,42% of eligible budget.

Start date	Jun-17
Final Investment Decision	Dec-20
Operation Date	Jun-22
Entry in the system	Sept-22
Current Status of Project	Under maturity
Financing plan	Poseidon Med II Grants (for studies), possible NSRF 2014-2020 grants[15], DESFA's own equity or loan
Recovery method	Inclusion in RAB of Additional LNG Services
Inclusion in the 3 year Development Period	Yes

The project will be an implementation of the ongoing studies under POSEIDON MED II.
POSEIDON MED II, under the auspices of the INEA (Innovation and Network Executive Agency), is part of the necessary steps towards adopting liquefied natural gas as a marine fuel in the Eastern Mediterranean, making Greece the focal point for supplying and distributing liquefied natural gas in Southeast Europe, implementing Directive 94/2014 / EU and Law 4439/2016 incorporating the above Directive into Greek law. In this action 26 partners from shipping and gas industry from three EU Member States are involved (Cyprus, Greece, Italy).

The new jetty will be realized in the northeastern part of Revithoussa and will serve the loading of LNG to small scale ships (1.000 m3 and up to 28.000 m3).
The smallest ships will supply boats powered by LNG (cruisers, containerships, Ro-Pax), in the port of Piraeus primarily and possibly other ports.
The larger ships will supply satellite LNG storages and distribution stations to other ports in Greece (such as Patras, as foreseen in the Poseidon Med II program), as well as islands through virtual pipeline schemes.

Following the completion of the feasibility studies, geological prospections and analysis of the best available technologies on the internal markets, the project includes the construction of a new QUAYWALL (berth structure parallel to the shore), all the necessary cryogenic piping and devises (unloading arms, valves, instruments, controls, etc.).

4. M/R Station in the region of Poria

Project Summary	
Type of project	Planned Project
Type of investment	Metering & Regulating Station

[15] DESFA has requested 50,42% of the eligible budget.

Current Budget	2 million €
Expected benefit	Supply of new areas
Start date	Dec-19
Final Investment Decision	Dec-20
Operation Date	Jul-22
Entry in the system	Oct-22
Current Status of Project	Under maturity
Financing plan	DESFA's own equity or loan
Recovery method	Inclusion in RAB of Transmission Services
Inclusion in the 3 year Development Period	Yes

The project consists of an M/R Station at the prefecture of Poria in order to supply with natural gas through pipeline the cities of Kastoria, Argos Orestikon & Maniaki. The gas will be transported to Poria M/R through TAP pipeline.

5. CNG Station in the region of Poria

Project Summary	
Type of project	Planned Project
Type of investment	CNG Station
Current Budget	1 million €
Expected benefit	Supply of new areas
Start date	Dec-19
Final Investment Decision	Dec-20
Operation Date	Jul-22
Entry in the system	Oct-22
Current Status of Project	Under maturity
Financing plan	DESFA's own equity or loan
Recovery method	Inclusion in RAB of Non- Transmission Services
Inclusion in the 3 year Development Period	Yes

In connection to project "M/R Station at the prefecture of Poria", a CNG station is proposed in order to supply with compressed natural gas the city of Grevena. The gas will be transported to the CNG station through TAP pipeline.

6. M/R Station in the region of Aspros

Project Summary	
Type of project	Planned Project
Type of investment	Metering & Regulating Station
Current Budget	3 million €
Expected benefit	Supply of new areas
Start date	Dec-19
Final Investment Decision	Dec-20
Operation Date	Jul-22
Entry in the system	Oct-22
Current Status of Project	Under maturity
Financing plan	DESFA's own equity or loan
Recovery method	Inclusion in RAB of Transmission Services
Inclusion in the 3 year Development Period	Yes

The project consists of an M/R Station at the prefecture of Aspros in order to supply with n.g through pipeline the cities of Skidra, Edessa, Naousa, Veria & Gianitsa. The gas will be transported to Aspros M/R through TAP pipeline.

7. M/R Station in the region of Perdikas Eordeas

Project Summary	
Type of project	Planned Project
Type of investment	Metering & Regulating Station
Current Budget	3 million €
Expected benefit	Supply of new areas
Start date	Dec-19
Final Investment Decision	Dec-20
Operation Date	Jul-22

Entry in the system	Oct-22
Current Status of Project	Under maturity
Financing plan	DESFA's own equity or loan
Recovery method	Inclusion in RAB of Transmission Services
Inclusion in the 3 year Development Period	Yes

The project consists of an M/R Station in the region of Perdikas Eordeas in order to supply with natural gas through TAP pipeline the cities of West Macedonia for use in the installations of district heating (Kozani, Ptolemaida and Amyntaio) as well as in distribution networks (Florina). The district heating installations operate with the heat that is produced in the lignite units of PPC, which will be set out of operation in the near future due to the decarbonisation (the latest until 2028), that has been announced from the Government, in the framework of the National Energy and Climate Plan. The gas will be transported to the relevant M/R through TAP pipeline.
DESFA will exercise best efforts to accelerate the start of supply date as requested by the local authorities of the region.

8. Metering / Regulating Station Livadia U-2710

Project Summary	
Type of project	Planned Project
Type of investment	M/R Station
Current Budget	1,98 million €
Expected benefit	Enabling access to new Users
Start date	Jul-18
Final Investment Decision	Dec-20
Operation Date	Dec-21
Entry in the system	Mar-22
Current Status of Project	Under maturity
Financing plan	DESFA's own equity or loan
Recovery method	Inclusion in RAB of Transmission Services
Inclusion in the 3 year Development Period	Yes

The aim of this project is to install one M/R City Gate Station in the greater area of Livadia, in order to supply the distribution networks (19 barg MP) of Livadia city with natural gas. Project

includes building construction and installation (M/R Control Building), construction of Metering and Regulating skid with capacity of 11.500 Nm^3/h and outlet pressure of 16 barg, two (2) phase construction plan (1st phase: 5.750 Nm^3/h - 1 working + 1 stand by -, 2nd phase: 11.500 Nm^3/h – 2 working + 1 stand by -), construction of auxiliary installations (gas preheating system with central boilers, fuel gas system, gas actuation systems, odorization system), construction of steel shelter for the protection of M/R skid (Skid Shelter), as well as connection with the existing central inlet (4") and outlet (6") Emergency Shut Down valve stations, both with 4" by pass arrangement, for gas supply of final consumers.

9. Megalopoli M/R city gate station

Project Summary	
Type of project	Planned Project[16]
Type of investment	Metering & Regulating station
Current Budget	2,7 million €
Expected benefit	Enabling access to new Users
Start date	Jun-20
Final Investment Decision of temporary M/R Station	July-20
Operation Date of temporary M/R Station	Dec-20
Entry in the system of temporary M/R Station	Dec-20
Final Investment Decision	Mar-21
Operation Date	Jun-22
Entry in the system	Sep-22
Current Status of Project	Under maturity
Financing plan	DESFA's own equity or loan
Recovery method	Inclusion in the RAB of Transmission System
Inclusion in the 3 year Development Period	Yes

The investment consists of one Metering Regulating city gate station at the area of Megalopoli including building construction and installation (M/R Control Building), construction of Metering and Regulating skid with outlet pressure of 16 barg, construction of auxiliary

[16] Transferred from the Small Projects List

installations (gas preheating system with central boilers, fuel gas system, gas actuation systems, odorization system), construction of steel shelter for the protection of M/R skid (Skid Shelter), as well as connection with the existing NNGTS pipeline (24") at Perivolia.

The project includes also a temporary M/R station for the faster supply of the region with natural gas.

B4. Development Projects: Increase of capacity & security of supply of NNGS

1. Compression Station in Kipi and Regulating Station in Komotini

Project Summary	
Type of project	Planned Project
Type of investment	Compressor station, Regulating station
Current Budget	15 million €
Expected benefit	Technical adequacy of NNGS, increase of capacity of NNGS
Start date	Jul-07[17]
Final Investment Decision	Jul-21
Operation Date	Jul-23
Entry in the system	Oct-23
Current Status of Project	Under maturity
Financing plan	Possible grant from NSRF 2014-2020[18], DESFA's own equity or loan
Recovery method	Inclusion in RAB of the Transmission Services
Inclusion in the 3 year Development Period	Yes

The project aims at increasing the pressure of the gas entering from the Entry Point Kipi and is required in order to serve the needs of the Greek market west of Komotini for import of gas from Turkey above the current technical capacity of the 4,3 mNm^3/ day, and / or to ensure reverse physical flow to the Interconnection Point Sidirokastro above the existing capacity of 5,7 Nm^3/d (in combination with Ambelia compressor station project), or/and to allow the flow of gas to the NNGS from a possible underground storage in the area of Kavala or a possible new LNG terminal in Alexandroupoli, according to the relevant simulation studies. It will also

[17] Approval time of basic design
[18] DESFA has requested grant of 50,05% of the eligible cost.

enhance the flexibility of operation of the whole NNGTS and ensure the capacity of transportation of gas in the direction North to South.

The project is included in the 4th PCI list that was issued by EC in 2019. The capacity of the compressor is preliminarily estimated at (1+1) x 2,5 MW ISO.

The Regulating Station in Komotini is necessary for safety reasons because the Maximum Allowable Operating Pressure (MAOP) of the pipeline west of Komotini is lower.

2. Compressor Station in Ambelia

Project Summary	
Type of project	Planned Project
Type of investment	Compressor Station
Current Budget	65 million €
Expected benefit	Efficiency of NNGS, effective operation in respect to prevent congestion
Start date	Jun-17
Final Investment Decision	Nov-20
Operation Date	Mar-23
Entry in the system	Jun-23
Current Status of Project	Under maturity (the basic design is ongoing)
Financing plan	Possible NSRF 2014-2020 grants[19], DESFA's own equity or loan
Recovery method	Inclusion in RAB of Transmission Services
Inclusion in the 3 year Development Period	Yes

The project is necessary on the basis of the hydraulic simulation studies carried out by DESFA and given the expected increase in the transported quantities of natural gas from north to south with the start of the TAP pipeline and its interconnection with NNGTS in Nea Messimvria. The existing technical capacities at North Entry Points (Sidirokastro + Kipi) are considered to remain as of today.
In order to ensure the hydraulic stability and efficiency of the system, irrelevant of the entry point the Users will select, it is necessary to progressively increase the technical capacity of the NNGS with the installation of a compressor station at the southern part of Greece, which concentrates the larger part of the demand.

[19] DESFA has requested 50,84% of eligible budget.

According to preliminary estimation, the compressor station will include two compressor units plus one spare with size (2+1) x 10 MW. However, the detailed characteristics of the units will be defined during the basic design. Furthermore, the station will be designed to provide also the possibility of compression in reverse flow.

3. Upgrade of Nea Messimvria compressor station

Project Summary	
Type of project	Planned Project
Type of investment	Compressor station
Current Budget	15,9 million €
Expected benefit	Efficiency of NNGS, effective operation in respect to prevent congestion
Start date	Mar-18
Final Investment Decision	Sep-20
Operation Date	Sep-22
Entry in the system	Dec-22
Current Status of Project	Under maturity
Financing plan	Possible NSRF 2014-2020 grants[20], DESFA's own equity or loan
Recovery method	Inclusion in RAB of Transmission Services
Inclusion in the 3 year Development Period	Yes

The project is considered necessary since TAP pipeline is scheduled to be connected to NNGTS upstream as well as downstream the existing compressor station in Nea Messimvria (Planned project "Metering/Regulating station in Nea Messimvria for the connection to TAP"). For the cases that TAP gas is injected upstream the existing compressor station, in order to ensure the hydraulic stability of the transmission system, in combination with Ambelia compressor station, it is necessary to install a 3rd compressor unit at Nea Messimvria with similar characteristics to the existing ones.

4. Booster Compressor for TAP in Nea Messimvria

Project Summary	
Type of project	Planned Project

[20] DESFA has requested 50,27% of eligible budget.

Type of investment	Compressor station
Current Budget	30 million €
Expected benefit	Efficiency of NNGS, effective operation enabling transit flows
Start date	Dec-19
Final Investment Decision	Nov-20
Operation Date	Mar-23
Entry in the system	Jun-23
Current Status of Project	Under maturity (preparation of the documents for the procurement of the basic design)
Financing plan	Possible grant NSRF 2014-2020[21], DESFA's own equity or loan
Recovery method	Inclusion in RAB of Transmission Services
Inclusion in the 3 year Development Period	Yes

The project concerns the installation of a new Compressor Station in order to supply the Trans Adriatic Pipeline with delivery pressure significantly higher than the NNGS' operating pressure.

According to the provisions of the aragraph 4.7.4 of Joint Decision of Greek, Albanian and Italian Regulators for the exemption of TAP from articles 9, 32, 41(6), (8) and (10) of Directive 2009/73/EC (Decision of RAE 269/2013 Gov. Gaz. 1833/29.07.2013) at least one (1) Tie-In Point between NNGS and TAP pipeline should be realized, with a nominal capacity of 10 mil. Nm^3/ day and bi-directional flow capability. The cost of construction of the above mentioned investment, based on the exemption decision, will be covered by DESFA and will be recovered through the tariffs of the Users of the National Natural Gas System.

According to the regulatory framework the tie in point must be bidirectional. Flow from NNGTS to TAP due to the difference in the operating pressure (66,4 barg vs 93 barg respectively) requires the installation of a Compressor Station.

This investment enables the full bi-directional flow in the interconnection (2nd phase of the project).

The project is included in the PCI list.

The characteristics of the compressor station were preliminarily identified to 7 MW ISO plus the spare unit (7MW ISO) or, alternatively, (2+1) x 3,5 MW ISO. The final configuration and the detailed characteristics of the Compressor Units will be defined during the basic design stage. The Compressors will be either Electric Compressors (ELCO) or gas turbine compressors (TUCO) or a combination of the two. The final selection will be defined during the basic design stage, taking into consideration the operational modes of the Station.

[21] DESFA has requested grant of 50,52% on the eligible cost.

Construction of the project will take place after settlement with TAP AG of any technical issues with regard to reverse flow (e.g. gas quality specifications).

B5. Development Projects: Improvement / modernization/ maintenance of NNGS

1. Upgrading of Electrical and Electronic Equipment, Billing System and Equipment SCADA Field in Stations M/R of 1st generation (1995-2000)

Project Summary	
Type of project	Planned Project, Maintenance Project
Type of investment	Equipment for control/management of transmission system
Current Budget	3,5 million €
of which maintenance capex	*3,5 million €*
Expected benefit	Efficiency of NNGS, effective operation
Start date	16-May-12
Final Investment Decision	Taken
Operation Date	Dec-20
Entry in the system	Dec-20
Current Status of Project	Under construction
Financing plan	DESFA's own equity or loan
Recovery method	Inclusion in RAB of the Transmission Services
Inclusion in the 3 year Development Period	Yes

The project refers to 15 stations of NNGS (M VFL, M/R PPC Komotini, M/R EKO, M/R Platy, M/R Larissa North, M/R Larissa South, M/R Volos, M/R Athens North, R Ano Liossia, M/R Athens East, M PPC Lavrio, M/R Thriassio, M/R Athens West, M Agia Triada, M/R Inofita) of which the existing equipment for metering and managing invoicing and signaling has overpassed a 10 year operation period thereby creating maintenance problems due to both unavailability of spare parts from manufacturers and equipment compatibility issues.
The SCADA Field equipment in these Stations is non-commercially available by the manufacturing company, which has no longer stock of spare parts, making the maintenance of equipment costly or impossible in some cases.
This results to the increase of operating costs and the low efficiency of the equipment.
The investment will combine the use of common equipment to serve at the same time the operational needs of both the station and the system SCADA and will ensure the smooth

operation of the equipment at the lowest possible operating cost, thus satisfying the main objective of the company for safe and reliable transport of natural gas.

2. Integrated Information System for Natural Gas

Project Summary	
Type of project	Planned Project
Type of investment	Equipment for control/management of transmission system
Current Budget	0,38 million €
Expected benefit	Efficiency of NNGS, effective operation
Start date	31-May-10
Final Investment Decision	Taken
Operation Date	Jul-20
Entry in the system	Jul-20
Current Status of Project	Under construction
Financing plan	DESFA's own equity or loan
Recovery method	Inclusion in RAB of the Transmission Services
Inclusion in the 3 year Development Period	Yes

The purpose of the project is the development, installation and commissioning of the Integrated Information System for natural gas (IISNG), which is to be the main communication / transaction platform between DESFA and NNGTS/LNG Users as well as between NNGS Users / Selected Customers based on the provisions of the Network Code. The IISNG is a regulatory obligation for DESFA under National and European Regulatory Framework for the Gas Market.

The IISNG consists of the Information System through which the management of the primary market for NNGS capacity is implemented (eg booking of transmission capacity and gasification capacity, daily reporting, calculation and notification of quantity allocations, LNG facility storage management, calculation of charges for the usage of NNGTS and LNG etc.)

Through IISNG, actions that must be continuously conducted both by DESFA and Users are automated, as provided for in the relevant regulatory framework.

3. Upgrading Projects of NNGS -1st group

Project Summary

Type of project	Planned Project, Maintenance Project
Type of investment	Equipment of the NNGTS
Current Budget	2,142 million €
of which maintenance capex	*2,142 million €*
Expected benefit	Efficiency of NNGS, effective operation
Start date	31-May-10
Final Investment Decision	Taken (project 1, Table 1) Taken (project 2, Table 1)
Operation Date	Mar-21 (project 1, Table 1) Sep-21(project 2, Table 1)
Entry in the system	Jun-21 (project 1, Table 1) Sep-21 (project 2, Table 1)
Current Status of Project	Under construction (project 1, Table 1) Under maturity (project 2,Table 1)
Financing plan	NSRF 2014-2020 grants for the 1st subproject, DESFA's own equity or loan
Recovery method	Inclusion of cost in RAB of Transmission Services
Inclusion in the 3 year Development Period	Yes

These projects upgrade the operation of the NNGS. Table below presents these projects in a more analytical way.

Table 1 - Projects for the upgrade of the operation of NNGS

No.	INVESTMENTS	COST (€)	FINAL INVESTMENT DECISION	OPERATION DATE	ENTRY IN THE SYSTEM
1	Upgrade of SCADA in dispatching centers	1.900.000	Taken	Mar-21	Jun-21
2	Design, supply, installation, system design of daily gas flow	242.000	Taken	Sep-21	Sep-21
	TOTAL	**2.142.000 €**			

Each one of those investments in Table 1 is described in the next paragraphs.

1. Upgrade of SCADA in dispatching centers

The project includes the procurement, installation and operation of a new SCADA system in the main dispatching center in Elefsina as well as in the back up dispatching center in Nea Messimvria. The project also includes the architectural and electromechanical upgrade of the main dispatching center in Elefsina, in order to facilitate the capabilities of the new SCADA system.

The new SCADA system in the Control Centers will replace the current system, which began trading in 2006, and will provide DESFA with new tools for managing graphic images, database, system alarms, historical data, and so on. It is noted that the equipment of the existing SCADA Control Center system is not supported by the manufacturing company, which no longer holds a security reserve for it.

The investment will enhance the utilization of the system's capabilities (user friendliness, better display of parameters, ease of designing new graphic images, etc.), improve the management of NNGTS within the European and Greek regulatory framework and ensure the Telepresence and remote control of NNGTS and its extensions for the next decade.

This project is co-financed from NSRF 2014-2020 with 51,35%.

2. Design, supply and installation of a daily gas flow system design

The establishment of a system for forecasting-planning-control of daily gas flow will provide DESFA the ability to:

- ✓ estimate the volume of gas that will be transmitted,
- ✓ increase the level of accuracy in the prediction of the volume
- ✓ embody a regular review of the progress of the daily planning of gas and
- ✓ adjust the levels of unexpected consumption or shortages in supply.

The investment will:

- ✓ unburden DESFA from operating costs (overtime of field staff, unnecessary start-up/shut-down of LNG terminal, Compressor N. Messimvria, etc.)
- ✓ optimize the management of Users' reports and
- ✓ provide daily justified gas flow plans.

4. Upgrade of LNG Loading Arms at Revithoussa LNG Terminal

Project Summary	
Type of project	Planned Project, Maintenance Project
Type of investment	LNG facility loading arms
Current Budget	1,2 million €
of which maintenance capex	*1,2 million €*
Expected benefit	Efficiency of NNGS, effective operation
Start date	Apr-16

Final Investment Decision	Taken
Operation Date	Sept-20
Entry in the system	Mar-21
Current Status of Project	Under construction
Financing plan	DESFA's own equity or loan
Recovery method	Inclusion in RAB of LNG Services
Inclusion in the 3 year Development Period	Yes

The project scope is replacement of electrical and mechanical equipment of the LNG loading arms at Revithoussa LNG Terminal in order the LNG loading to be effected with equipment of modern technology. Latest technology electro pneumatic equipment shall be installed as well. Additionally, maintenance of the existing cryogenic equipment shall be executed after 20 years of operation. The project is deemed necessary for the safer and easier connection of the loading arms on the vessel (ship to shore connection) which is the most crucial and hazardous operation during LNG unloading.

5. LNG Terminal Boil-off Gas Compressor Station

Project Summary	
Type of project	Planned Project
Type of investment	LNG facility compressor station
Current Budget	10,6 million €
Expected benefit	Efficiency of NNGS, effective operation
Start date	Apr-16
Final Investment Decision	Taken
Operation Date	Jun-22
Entry in the system	Sep-22
Current Status of Project	Under construction
Financing plan	NSRF 2014-2020 grants[22], DESFA's own equity or loan
Recovery method	Inclusion in RAB of LNG Services
Inclusion in the 3 year Development Period	Yes

[22] It has been re-submitted with a percentage of 60,09% of eligible budget.

In order for DESFA to manage with the best possible way the produced boil-off gases (BOG) in the LNG Terminal of Revithoussa from the cryogenic facilities (2nd upgrade) as well as from the unloading/loading phase and mainly to avoid the combustion of the gases in the flair of the facility in the case of no send-out operation, DESFA will install a new compressor station for BOG so as to increase the pressure and inject them to the national natural gas system.

The new project consists of the following parts:

- Compressor station unit of total throughput of 10.000 kg/h and discharge pressure 26÷64 barg
- Knock Out Drum container in the sanction of compressors
- System for water cooling with cooler and re-circulation pumps
- Metal building for the accommodation of the compressor unit of 420 m^2 surface, including the electromechanical infrastructure
- Electrical facility for the power supply to compressors, coolers, pumps and building
- Installation of automation and control of new installations and interconnection with the central control room
- Pipeline networks for the transport of waste water and extension of the existing auxiliary networks of the station (compressed air, nitrogen, water etc.)
- Extension of the plant's fire protection facilities
- Decommissioning of the existing nitrogen facility and relocation to a new location

This project, apart from saving of LNG significantly for the users of the station is an important environmental benefit by eliminating the carbon dioxide emissions during the period of non-operation of the Terminal.

6. Upgrading Projects of NNGS -3rd group

Project Summary	
Type of project	Planned Project, Maintenance Project
Type of investment	Equipment for the NNGTS and LNG
Current Budget	1,1 million €
Expected benefit	Efficiency of NNGS, effective operation in order to prevent emergency situations
Start date	Jun-17
Final Investment Decision	Taken (project 1 table 2) Jul -20 (project 2 table 2)
Operation Date	Feb-21 (project 1 table 2) Dec-20 (project 2 table 2)
Entry in the system	Feb-21 (project 1 table 2) Dec-20 (project 2 table 2)

Current Status of Project	Under construction (project 1 table 2) Under maturity (project 2 table 2)
Financing plan	DESFA's own equity or loan
Recovery method	Inclusion in RAB of Transmission and LNG Services
Inclusion in the 3 year Development Period	Yes

Table 2 – Projects for the upgrade of NNGS operation

No.	Investments	Estimated cost(€)	Final Investment Decision	Start of operation date & inclusion in the system
1	Upgrade of electrical circuit breakers for medium voltage and internal lighting in the control room of LNG facility	1.000.000	Taken	Feb-21
2	Upgrade of Geographical Information System (GIS) system	100.000	July-20	Dec-20
	TOTAL	**1.100.000 €**		

The following paragraphs analyze the feasibility and the technical characteristics of the projects presented in above table.

1. Upgrade of electrical circuit breakers for medium voltage and internal lighting in the control room of LNG facility

It concerns the supply and replacement of medium voltage (6 kV) electrical circuit breakers at the LNG facility (45 pcs.) aiming at the smooth operation of the automation in the distribution of electricity and supply of medium voltage loads (motors and pumps). The upgrade study is in progress.

2. Upgrade of Geographical Information System (GIS) system

The project will further develop DESFA's geographic database in order to fully integrate DESFA's assets and their efficient performance through GIS-web applications to the end users.

7. Upgrade of physical protection of DESFA facilities - Physical Safety Control Center

Project Summary	
Type of project	Planned Project

Type of investment	Equipment of the NNGTS and LNG facility
Current Budget	1,2 million €
Expected benefit	Efficiency of NNGS, effective operation
Start date	Jun-17
Final Investment Decision	July-20
Operation Date	Dec-21
Entry in the system	Dec-21
Current Status of Project	Under maturity (under the preparation of the tender for the construction award)
Financing plan	DESFA's own equity or loan
Recovery method	Inclusion in RAB of Transmission and LNG Services
Inclusion in the 3 year Development Period	Yes

NNGS facilities are considered as European critical infrastructure. Possible shutdown or destruction would have a significant impact on the country and Europe-wide.
The aim of the project is to upgrade the physical security of all DESFA infrastructure due to the rapid development of the technological applications in the sector and the establishment of a Physical Security Control Center covering the requirements of the Directive 2008/114/EC concerning critical infrastructure security, which was incorporated into the Greek law with Presidential Decree 39/2011.
The aim is to prevent, mitigate and eliminate risk threats (examples include theft, sabotage, terrorism, accidents, and natural phenomena).
The project includes:
-Implementing a vulnerability study of all DESFA installations and developing an Infrastructure Safety Management Plan
- Compilation of Technical Specifications of Safety Systems and Physical Security Control Center
- Installation of security systems in DESFA (eg CCTV systems, tamper detectors, alarms, headlamps, access control etc.)
- Development and operation of a Physical Security Control Center for the management and coordination of the security systems of the Infrastructure.

8. Improvement of metering accuracy in NNGTS stations

Project Summary	
Type of project	Planned Project, Maintenance Project

Type of investment	Equipment of NNGTS
Current Budget	0,39 million €
of which maintenance capex	*0,39 million €*
Expected benefit	Efficiency of NNGS, effective operation
Start date	Jun-17
Final Investment Decision	Taken
Operation Date	Sep-20
Entry in the system	Dec-20
Current Status of Project	Under construction (under procedure for award of the procurement)
Financing plan	DESFA's own equity or loan
Recovery method	Inclusion in RAB of Transmission Services
Inclusion in the 3 year Development Period	Yes

In the context of the public consultation of the Development Plan 2016-2025 it was pointed out that in some distribution networks due to low consumption there are differences between the amount of gas resulting from the sum of the metering systems of the distribution networks and the quantity of gas measured in the M/ R stations that feed the corresponding Distributed Network Exit Point of the NNGTS.
DESFA examined the issue and it concluded that in 17 M/R stations the turbine meters operate for a substantial amount of time outside of their approved metering rates. This occurs due to the low consumption rates in the distribution networks that are connected to the relevant Exits of the NNGTS.
In order to resolve the problem, said turbine meters (31 in total) should be replaced in 17 stations with new ones that combine improved operational features such as lower Qmin requirement and improved minimum / maximum flow ratio-from 1:20 to 1:50.

9. Replacement of Metering and Supervision/ Control systems at NNGTS M and M/R stations of NNGTS

Project Summary	
Type of project	Planned Project, Maintenance Project
Type of investment	Equipment for control/management of NNGS
Current Budget	4,5 million €
of which maintenance capex	*4,5 million €*

Expected benefit	Efficiency of NNGS, effective operation
Start date	Jun-17
Final Investment Decision	July-20
Operation Date	Aug-22
Entry in the system	Oct-22
Current Status of Project	Under maturity (under the preparation of the tender of construction award)
Financing plan	DESFA's own equity or loan
Recovery method	Inclusion in RAB of Transmission Services
Inclusion in the 3 year Development Period	Yes

The project concerns the replacement of the Measurement Management and Supervision / Control Systems in twenty four (24) existing Metering (M) and Metering / Regulating (M / R) Stations, in order to achieve:

- the compatibility with each other as well as with the already upgraded 15 M/R stations and the planned new stations as presented in the planned projects herein, through similar equipment and software as well as similar architecture, achieving on the one hand direct economies of scale, by maintaining a smaller number of required spare parts and consumables and on the other hand by the support services of these systems during their operational phase,

- the separation to the maximum extent of the Measurement Management System from the Supervision /Control System at NNGTS Stations, achieving (a) the stations' measurement data to be collected in the SCADA of the Control and Load Distribution Centers (KEKF) of DESFA directly - without intermediate processing - by the certified Multi-Stream Flow Computers which will be installed in the framework of this project at the NNGTS stations and (b) by extension the optimization of the services provided by DESFA under the requirements of European and national regulatory framework (e.g. publication of data, validation of measured quantities etc), and

- to ensure the operation of the Measurement Management and Supervision / Control Systems of the Stations for the next decade as the equipment and software at these Stations operate on average for a decade and is expected not to be supported by the manufacturers in the coming period.

The replacement of the Measurement Management and Supervision / Control Systems in the Stations of DESFA refers to the following elements:

- SCADA & Telecom
- programmable Logic Controller – PLC

- flow computer
- gas chromatograph, and
- equipment of local stations network.

10. New building for DESFA's headquarters

Project Summary	
Type of project	Planned Project
Type of investment	Project for the control/management of the NNGS
Current Budget	13,5 million €
Expected benefit	Efficiency of NNGS
Start date	Jun-17
Final Investment Decision	Sep-20
Operation Date	Dec-22
Entry in the system	Dec-22
Current Status of Project	Under maturity
Financing plan	DESFA's own equity or loan
Recovery method	Inclusion in RAB of Transmission Services [23]
Inclusion in the 3 year Development Period	Yes

DESFA headquarters are now housed in a rented building. It is considered cost efficient for DESFA to acquire a privately-owned headquarters building, which will constitute a company's fixed asset, contribute to the saving of operating expenses and ensure improved health and safety of work, while it will in parallel promote and represent the vision and the values of the company.

The office area is planned to be approximately 6.500 square meters in line with the existing DESFA headquarters.

The goal is to avoid burdening the NNGS users due to the savings that will be achieved, mainly by the rental cost. It is also estimated that there will be energy savings due to stricter energy specifications of the new building.

The implementation of the project is expected to be finalized until the end of 2022, including also modification works. The building will be depreciated in 40 years.

[23] Under the provision that, with regulatory depreciation of 40 years, there will be a negative impact on the Average Tariff for the use of NNGS.

11. Technical Training Centre in Nea Messimvria

Project Summary	
Type of project	Planned Project
Type of investment	Equipment of the NNGS
Current Budget	1,6 million €
Expected benefit	Efficiency of NNGS, effective operation
Start date	Jun-17
Final Investment Decision	July-20
Operation Date	Sep-21
Entry in the system	Sep-21
Current Status of Project	Under maturity (under tender procedure for the award of construction)
Financing plan	DESFA's own equity or loan
Recovery method	Inclusion in RAB of Transmission and LNG Services
Inclusion in the 3 year Development Period	Yes

The project concerns the construction of a Training Center for the theoretical and practical practice of natural gas technicians. The development of such infrastructure will be the first in the Balkan region. It will be used primarily for the needs of the DESFA staff, but it creates an opportunity of additional services for the training of personnel of other TSOs and DSOs, contributing to the reduction of costs for the Greek network users.

In particular, the Training Center will consist of a central building, which will house the administration and operation areas for theoretical education, as well as a separate installation in which the necessary equipment for natural gas networks will be installed for practical training.

12. Increment of the back-up power availability at the Revithoussa LNG terminal

Project Summary	
Type of project	Planned Project
Type of investment	LNG facility power supply
Current Budget	3,5 million €
Expected benefit	Allow for back-up power availability in Revithoussa terminal

Start date	Dec-19
Final Investment Decision	July-20
Operation Date	Mar-21
Entry in the system	Mar-21
Current Status of Project	Under construction
Financing plan	DESFA's own equity or loan
Recovery method	Inclusion in RAB of LNG Services
Inclusion in the 3 year Development Period	Yes

The project concerns the increment of the back-up power availability at the Revithoussa LNG terminal, from 9 MVA to 12 MVA, using the existing PPC lines.
After the successful Post Expansion Performance Test for 2nd Upgrade of Revithoussa LNG Terminal, it was noted that due to the high power consumption of the existing various equipment at the upgraded Revithoussa LNG Terminal, there is no adequate power back up system, so as to cover all the operation modes.
The necessary actions for the increment concern mainly works carried out by HEDNO at the area of existing HV/MV Substation at Megara. All necessary works at the existing electrical installation will also be carried out.

13. NNGS Modernization projects – 4th compilation

Project Summary	
Type of project	Planned Project, Maintenance Project
Type of investment	Equipment for the NNGTS
Current Budget	0,49 million €
of which maintenance capex	*0,49 million €*
Expected benefit	Increased efficiency of the system
Start date	Jun-19
Final Investment Decision	Taken
Operation Date	Dec-20
Entry in the system	Dec-20
Current Status of Project	Project 1: under construction Projects 2 &3 : under maturity
Financing plan	DESFA's own equity or loan
Recovery method	Inclusion in RAB of Transmission Services

Inclusion in the 3 year Development Period	Yes

1. Replacement of (2) Regulating Valves 24'' Mokveld

The implementation of the project involves the replacement of two (2) Regulating Mokveld Valves 24'' at Border Metering Station (BMS) of Sidirokastro aiming the improvement of controllability and the enhancement of availability during the upcoming unmanned operation of the station. The total required budget for the procurement and installation of the new axial control valves amounts to 350.000 €.

2. Replacement of two (2) Chiller systems

The scope of work includes the procurement and replacement of two (2) Chiller YORK systems at the Border Metering Station (BMS) of Sidirokastro aiming the environmental upgrade of the cooling system and its better maintenance.

3. Upgrade of three (3) odorant units in Metering Stations

Procurement and installation of three (3) odorant units in Metering Stations in Alexandroupolis, Komotini and Petropigi is the core of the project with the aim of upgrading the odorant services of NNGTS. The budget is estimated at 70.000 €.

14. Upgrade of LNG and O &M Facilities for energy saving

Project Summary	
Type of project	Planned Project, Maintenance Project
Type of investment	Equipment for NNGTS & LNG Facility
Current Budget	2 million €
of which maintenance capex	*2 million €*
Expected benefit	Increased efficiency of the system
Start date	Dec-19
Final Investment Decision	July-20
Operation Date	Dec-21
Entry in the system	Dec-21
Current Status of Project	Under maturity
Financing plan	DESFA's own equity or loan
Recovery method	Inclusion in RAB of Transmission and LNG Services
Inclusion in the 3 year Development Period	Yes

1. **Upgrade of LNG Facilities**

This project includes replacing of air conditioners with new type INVERTER, replacement of external lighting with new light fixtures (led). The budget is estimated at 100.000 €.

2. **Upgrade of O&M Facilities**

The aim of the project is the energy upgrading of the Building and Electrical / Mechanical Facilities of the Operation and Maintenance Centers in order to achieve energy savings in accordance with the Energy Performance Regulation of buildings "KENAK" (Government Gazette B 2367/12.07.2017). This upgrade may include, among other things, air conditioning systems, lighting systems and the installation of photovoltaic systems to meet the needs of the center in electricity. The budget is estimated at 1.900.000 €.

15. Cathodic Corrosion Protection System Upgrading

Project Summary	
Type of project	Planned Project
Type of investment	Equipment for NNGTS
Current Budget	2 million €
Expected benefit	Increased efficiency of the system
Start date	Jul-19
Final Investment Decision	Taken
Operation Date	Jan-23
Entry in the system	Jan-23
Current Status of Project	Under maturity
Financing plan	DESFA's own equity or loan
Recovery method	Inclusion in RAB of the Transmission Services
Inclusion in the 3 year Development Period	Yes

A continuous monitoring of Cathodic Protection System (CPS) can be used as a pipeline integrity diagnostics tool complementary to In-Line Inspection (ILI), enriching also with valuable data the Pipeline Integrity Management System (PIMS).

The upgrading of the CPS, involves three main components:

1. **Equipment for remote monitoring and control of CPS:**
   a) Remote monitoring and control of CPS Rectifiers and test posts
   b) Recording of corrosion rates and other CP data at special coupons (ER probes)

   The project will also include the replacement of Transformers / Rectifiers with low-cost DC modules.

2. **Revision - Updating of proximity effects (electromagnetic interference) studies:**
In order to propose the improvement or extension of the pipeline earthing system, including lightning protection of insulating joints, risk assessment of pipeline damage by lightning and a corrosion risk assessment.

3. **Replacement of DC decoupling devices in the existing pipeline earthing system**

16. Hydraulic Simulation software of NNGTS upgrade in real time

Project Summary	
Type of project	Planned Project
Type of investment	Project for control/management of the transmission system
Current Budget	0,412 million €
Expected benefit	Increased efficiency of the system
Start date	Dec-19
Final Investment Decision	Taken
Operation Date	Sep-21
Entry in the system	Sep-21
Current Status of Project	Under maturity
Financing plan	DESFA's own equity or loan
Recovery method	Inclusion in RAB of Transmission Services
Inclusion in the 3 year Development Period	Yes

Upgrade of the existing simulation software Pipeline Manager. The software package will be adapted to the NNGTS and will offer on-line and off-line simulation for NNGTS operation and management. Real time and historical data will be fetched from the SCADA and load forecast systems. One configurator license to update or modify the model will be included.
The project is necessary in order to enable a new mode of operation of the NNGS, based on real time data collection and analysis, allowing the TSO to introduce predictive maintenance, training on the job of control room operators, automatic fault detection and other important innovative practices that will increase the reliability and the efficiency of the system.

The following features will be supported:

- Hydraulic profiles of pipeline
- Pipeline inventory / line pack management
- Over and under pressure detection at any point of pipeline
- Leak detection and location

- Gas composition tracking and early off-spec warning
- Scraper module (pig) tracking
- Predictive analysis forecasting near future pipeline conditions, running what-if and look-ahead scenarios, performing survival analysis of potential major disruptions or balancing crisis.

17. IT Transformation

Project Summary	
Type of project	Planned Project
Type of investment	IT System
Current Budget	7 Million €
of which Maintenance Capex	7 Million €
Expected benefit	Digitalize and automate DESFA's core processes Enhance data-driven insights and decision-making Enable seamless collaboration and communication across departments and 3rd Parties Achieve Asset Lifecycle Management excellence by shortening maintenance work cycles Leverage Innovation Technologies for Gas Transmission Network Monitoring, Inspection and Defects Detection Gain a holistic view of the organization's risks and compliance with the Regulatory Framework
Start date	Sep-2019
Final Investment Decision	Jul-20
Operation Date	Phase 1: Jan-2021 Phase 2: Jan-2022
Entry in the system	Phase 1: Jan-2021 Phase 2: Jan-2022
Current Status of Project	Under Maturity
Financing plan	DESFA's own equity or loan
Recovery method	Inclusion in RAB of Transmission Services

Inclusion in the 3 year Development Period	Yes

With the strategic goal of digital transformation and in response to market challenges and requirements, DESFA has developed a five-year transformation roadmap for the transition to the new IT/OT Operating model. In this context, the "IT/OT Transformation Programme" constitutes the full implementation of the five-year roadmap, which includes the establishment of a Data Governance and Security Framework and the further development of existing and implementation of new IT services. This project consists of two main workstreams:

1. **Phase 1**: Including actions aiming at further improving the IT Governance Model and achieving optimal level of Information Security. Amongst others, the stream includes the design of an Information Security Framework based on best practices and international standards, the implementation of security mechanisms / controls to achieve optimum level of security as well as the development of appropriate procedures for the optimal provision of IT services internally and externally. In addition, this stream includes Digital Transformation activities in Cloud environments and the implementation of periodic security risk assessments on IT services and critical transmission network infrastructure of the National Natural Gas System.
2. **Phase 2**: Including actions related to further improving and replacing part of existing applications as well as introducing new technologies. Specifically, the upgrade of core applications to cover DESFA's financial services and procurement activities is included as well as the design and implementation of necessary applications to optimize the complaints and customer care management and the achievement of optimal asset lifecycle management of the National Natural Gas System.

The purpose of this project is to meet the objectives of the corporate strategy; DESFA intends to replace part of the existing IT services that support its core business operations and introduce new technologies aiming at a continuous process for: the modernization of the IT Landscape, the automation and digitalization of business processes, the optimization of the operational activities, the increase of reliability and compliance with the regulatory framework, the reduction of operational costs.
Main pillars of this project are the new ERP SAP system, the implementation of the disaster recovery center, the creation of a document management system, the upgrade of the human capital management system, the introduction of modeling tools, an upgrade of the Integrated Project Management System, that will allow a faster, more reliable and efficient operation of the company.

18. Upgrade of LNG Facilities

Project Summary

Type of project	Planned Project [24]
Type of investment	Equipment for the LNG Facility
Current Budget	0,27 million €
Expected benefit	Increased efficiency of the system
Start date	Jun-20
Final Investment Decision	Dec-20
Operation Date	Mar-21
Entry in the system	Mar-21
Current Status of Project	Under maturity
Financing plan	DESFA's own equity or loan
Recovery method	Inclusion in the RAB of LNG Facility
Inclusion in the 3 year Development Period	Yes

The project consists of an:

1) Upgrade of equipment of LNG Facilities: This project includes a) Engineering, supply and installation of new PLC control system for Marin – Gangway, b) Engineering, supply and installation new PLC & HMI control system for SCV A/B and c) Replacement of Dry Powder system in LNG tanks A/B (supply and installation).

2) Upgrade of air supply system of LNG Facilities: This project includes design & supply of equipment for upgrading the air supply system (plant & instrument Air).

3) Engineering supply and installation of condensate treatment system for Combined Heat & Power Plant: Including engineering, supply and installation of condensate treatment system for Combined Heat & Power Plant.

19. Integrated Information System for Natural Gas Upgrade (year 2020)

Project Summary	
Type of project	Planned Project[25]
Type of investment	Equipment for control/management of transmission system
Current Budget	0,3 million €
Expected benefit	Efficiency of the NNGS System/effective operation

[24] Transferred from the Small Projects List
[25] Transferred from the Small Projects List

Start date	Apr-20
Final Investment Decision	Taken
Operation Date	Jul-20
Entry in the system	Aug-20
Current Status of Project	Under maturity
Financing plan	DESFA's own equity or loan
Recovery method	Inclusion in the RAB of Transmission Facility
Inclusion in the 3 year Development Period	Yes

The Integrated Information System for Natural Gas (IISNG) is the main communication / transaction platform between DESFA and NNGTS/LNG Users as well as between NNGS Users / Selected Customers based on the provisions of the Network Code. The IISNG is a regulatory obligation for DESFA under National and European Regulatory Framework for the Gas Market. DESFA is responsible for maintaining the IISNG up to date, in line with any changes of the regulatory framework, as well as Users' needs regarding expected functionalities. Especially for the year 2020, the IISNG is planned to be upgraded for the services regarding management of the LNG installations, and the Transmission System, the development of APIs for interfacing third party platforms, and B2B communication

Chapter III. Projects outside the three years Development Period

A. New Projects

A1. Projects for the interconnection of NNGS with other interconnected systems (connection/development projects)

There are no projects in this section.

A2. Projects for the connection of Users

There are no projects in this section.

A3. Development Projects

There are no projects in this section.

B. Planned Projects

B1. Projects for the interconnection of NNGS with other interconnected systems (connection/development projects)

1. Connection with the FSRU of Alexandroupolis

Project Summary	
Type of project	Planned Project
Type of investment	Metering & Regulating station
Current Budget	10 million €
Expected benefit	Diversification of supply of SEE region/security of supply
Start date	Jun-18[26]
Final Investment Decision	-
Operation Date	-
Entry in the system	-
Current Status of Project	-
Financing plan	DESFA's own equity
Recovery method	Connection Fee / Additional Connection Fee
Connection Agreement with User	Not yet
Inclusion in the 3 year Development Period	No

The project refers to the M/R station for the receiving of natural gas from the FSRU in Alexandroupolis, for which no FID (i.e. Resolution to Construct) has been taken yet. According to the conditions resulted from the hydraulic evaluation study, capacity to be reserved refers to (a) 1,9 mil. Nm^3/day on condition of equal flow of gas at exit points east of Komotini (conditional capacity), (b) 10,7 mil. Nm^3/day on condition of equal flow of gas at the exit point "Komotini/Connection with IGB" (conditional capacity) and (c) 0,7 mil. Nm^3/day without conditions, based on the assumption of current technical capacity at Kipi Entry Point and an assumed technical capacity at the entry point "N. Messimvria/ Connection with TAP" at the level of 4,1 mil. Nm^3/day (confirmation of the assumptions under (c) above pending).

2. Metering and Regulating Station for connecting South Kavala underground storage

Project Summary

[26] The Start date refers to the day of submission of the Advanced Reservation of Capacity.

Type of project	Planned Project
Type of investment	Metering & Regulating Station
Current Budget	7,5 million €
Expected benefit	Security of Supply
Start date	-
Final Investment Decision	-
Operation Date	-
Entry in the system	-
Current Status of Project	-
Financing plan	DESFA's own equity
Recovery method	Connection Fee / Additional Connection Fee
Connection Agreement with User	Not yet
Inclusion in the 3 year Development Period	No

The Metering and Regulating Station is necessary for the injection and withdrawal of gas to and from the Underground Storage in South Kavala to NNGTS, for which no FID has been taken yet.

B2. Projects for the connection of Users

1. Construction of High Pressure Pipeline Mavromati (Vagia)-Larymna and necessary Metering Station for the Connection of LARCO GMM SA with NNGS

Project Summary	
Type of project	Planned Project
Type of investment	Pipeline, Metering Station
Current Budget	17,5 million €
Expected benefit	Enabling access to new Users
Start date	Jun-13
Final Investment Decision	-
Operation Date	-
Entry in the system	-

Current Status of Project	Under maturity
Financing plan	-
Recovery method	-
Connection Agreement with User	Not yet
Inclusion in the 3 year Development Period	No

The project consists of:

- Pipeline of 36 km and 10inch diameter which will start from the main natural gas pipeline line valve station "Mavromati (Vagia)" and ends up in the facility of LARCO in Larymna.
- Metering station that will be installed in land provided by LARCO

Technical studies as well as licenses procedures for the project are in progress. These studies are carried out under DESFA's contract with LARCO for the "Elaboration of studies for the connection of the installations of LARCO SA with NNGS".
The project is not included in the projects of the three-year period as there is no progress regarding User's commitment from its starting date until now.

B3. Development Projects

There are no projects in this section.

Chapter IV. Projects that are not included in the Development Plan 2021-2030

The project "Komotini -Thesprotia High Pressure Pipeline (part of NNGS)", which was included in the Development Plan 2020-2029 as Planned Project outside the three- years Development Period, is excluded from the Development Plan 2021-2030.
The project was included in the first TYDP 2010-2014 (O.G. B 1399/16.06.2011) and remained thereafter in all TYDPs, being also part of the Incremental Capacity project Greece- Italy initiated after an expression of interest by a prospective User in May 2017, which however was not continued. In brief, the project has remained for almost 10 years in the TYDP without proceeding to implementation, while there are no indications that the conditions for such will be met in the short term. Should interest for the project re-appear, DESFA will evaluate it in the framework of the European and Greek regulatory regime and proceed to all appropriate actions.

Annex I

Summary Table of the Projects of the NNGS Development Plan 2021-2030

	Three Year Development projects [27]		
	INVESTMENT	**COST (€)**	**MILESTONES**
	A. PROJECTS INCLUDED FOR THE FIRST TIME IN THE DEVELOPMENT PLAN		
	I. NEW PROJECTS Development Projects: Expansion of NNGS to new areas or markets		
1	NNGTS Pipeline to West Macedonia	110.000.000	Final Investment Decision: **03/2021** Start of operation: **09/2023** Inclusion in the system: **09/2023**
2	NNGTS Pipeline to Patras	85.000.000	Final Investment Decision: **12/2021** Start of operation: **12/2024** Inclusion in the system: **03/2025**
3	Korinthos M/R city gate Station	2.000.000	Final Investment Decision: **10/2020** Start of operation: **10/2022** Inclusion in the system: **10/2022**
4	Argos/Napflio M/R city gate Station	2.200.000	Final Investment Decision: **10/2020** Start of operation: **10/2022** Inclusion in the system: **10/2022**
5	Tripoli M/R city gate Station	2.000.000	Final Investment Decision: **10/2020** Start of operation: **10/2022** Inclusion in the system: **10/2022**

[27] Projects which the final Investment Decision (i) has been taken, (ii) is considered possible to be taken within three (3) years from the publication of the draft Development Plan in DESFA's website

	II. PLANNED PROJECTS Projects for the interconnection of NNGS with other interconnected systems (connection/development projects)		
6	M/R Station in N. Messimvria for the connection of TAP to the NNGS	12.000.000	Final Investment Decision: **Taken** Start of operation: **10/2020** Inclusion in the system: **12/2020**
7	Pipeline Nea Mesimvria – Evzonon/ Gevgelija and M Station	51.400.000	Final Investment Decision**: 12/2020** Start of operation: **11/2023** Inclusion in the system: **12/2023**
8	Interconnection of IGB Pipeline with the NNGS in Komotini	350.000	Final Investment Decision: **09/2020** Start of operation: **05/2021** Inclusion in the system: **07/2021**
	Projects for the connection of Users		
9	M Station at SALFA Ano Liossia	680.000	Final Investment Decision: **Taken** Start of operation: **12/2020** Inclusion in the system: **01/2021**
10	M/R Station AdG III	2.000.000	Final Investment Decision: **Taken** Start of operation: **12/2021** Inclusion in the system: **03/2022**
11	Connection with DEPA's CNG Station in Komotini	1.300.000	Final Investment Decision: **03/2021** Start of operation: **12/2022** Inclusion in the system: **03/2023**
12	Connection with DEPA's CNG Station in Tripoli	2.350.000	Final Investment Decision: **03/2021** Start of operation: **12/2022** Inclusion in the system: **03/2023**
13	Connection of Kavala Oil plant to the NNGTS	3.400.000	Final Investment Decision: **05/2021**

			Start of operation: **07/2022** Inclusion in the system: **12/2022**
14	Metering Station at Agios Nikolaos Viotia (AdG IV)	1.870.000	Final Investment Decision: **Taken** Start of operation: **03/2023** Inclusion in the system: **04/2023**
15	Connection of ELVAL plant of NNGTS	4.000.000	Final Investment Decision: **02/2021** Start of operation: **09/2022** Inclusion in the system: **12/2022**
16	Connection with TERNA Power Plant to the NNTGS	3.220.000	Final Investment Decision: **12/2020** Start of operation: **11/2022** Inclusion in the system: **12/2022**
17	Connection with ELPEDISON Power Plant to the NNTGS	2.160.000	Final Investment Decision: **01/2021** Start of operation: **09/2022** Inclusion in the system: **11/2022**
	Development Projects: Expansion of NNGS to new areas or markets		
18	Installation of M/R in Kavala	2.010.000	Final Investment Decision: **07/2020** Start of operation: **09/2021** Inclusion in the system: **09/2021**
19	Truck Loading Pilot (first) Station	6.500.000	Final Investment Decision: **Taken** Start of operation: **09/2021** Inclusion in the system: **12/2021**
20	New jetty for small scale LNG in Revithoussa	20.400.000	Final Investment Decision: **12/2020** Start of operation: **06/2022** Inclusion in the system: **09/2022**
21	M/R Station at the prefecture of Poria	2.000.000	Final Investment Decision: **12/2020**

			Start of operation: **07/2022** Inclusion in the system:**10/2022**
22	CNG Station at the prefecture of Poria	1.000.000	Final Investment Decision: **12/2020** Start of operation: **07/2022** Inclusion in the system: **10/2022**
23	M/R Station at the prefecture of Aspros	3.000.000	Final Investment Decision: **12/2020** Start of operation: **07/2022** Inclusion in the system: **10/2022**
24	M/R Station in the region of Perdikas Eordeas	3.000.000	Final Investment Decision: **12/2020** Start of operation: **07/2022** Inclusion in the system:**10/2022**
25	MR Station Livadia	1.980.000	Final Investment Decision: **12/2020** Start of operation: **12/2021** Inclusion in the system: **03/2022**
26	Megalopoli M/R city gate station	2.700.000	Final Investment Decision: **03/2021** Start of operation: **06/2022** Inclusion in the system: **09/2022** Final Investment Decision of the temporary M/R: **07/2020** Start of operation:**12/2020** Inclusion in the system of the temporary M/R : **12/2020**
	Development Projects: Increase of capacity & security of supply of NNGS		
27	Compression station at Kipi and Regulating Station in Komotini	15.000.000	Final Investment Decision: **07/2021** Start of operation: **07/2023** Inclusion in the system: **10/2023**

28	Compressor Station in Ampelia	65.000.000	Final Investment Decision**: 11/2020** Start of operation: **03/2023** Inclusion in the system: **06/2023**
29	Upgrade of Nea Messimvria compression station	15.900.000	Final Investment Decision: **09/2020** Start of operation: **09/2022** Inclusion in the system: **12/2022**
30	Booster Compressor for TAP in Nea Mesimvria	30.000.000	Final Investment Decision: **11/2020** Start of operation: **03/2023** Inclusion in the system: **06/2023**
	Development Projects: Improvement / modernization/ maintenance of NNGS		
31	Upgrading of electrical and electronic equipment, billing system and SCADA field equipment in M/R stations of 1st generation (1995-2000)	3.500.000	Final Investment Decision: **Taken** Start of operation: **12/2020** Inclusion in the system: **12/2020**
32	Integrated IT System for Natural Gas	380.000	Final Investment Decision: **Taken** Start of operation: **07/2020** Inclusion in the system: **07/2020**
33	Upgrade of SCADA in dispatching centers	1.900.000	Final Investment Decision: **Taken** Start of operation: **03/2021** Inclusion in the system: **06/2021**
34	Design, supply, installation of a system for the daily gas flow	242.000	Final Investment Decision: **Taken** Start of operation: **09/2021** Inclusion in the system: **09/2021**
35	Upgrade of LNG Loading Arms at Revithoussa LNG Terminal	1.200.000	Final Investment Decision: **Taken** Start of operation: **09/2020** Inclusion in the system: **03/2021**

36	LNG Terminal Boil-off Gas Compressor Station	10.600.000	Final Investment Decision: **Taken** Start of operation: **06/2022** Inclusion in the system: **09/2022**
37	Upgrade of electrical switches for medium voltage and internal lighting in the control room of LNG facility	1.000.000	Final Investment Decision**: Taken** Start of operation: **02/2021** Inclusion in the system: **02/2021**
38	Upgrade of Geographical Information System (GIS)	100.000	Final Investment Decision**: 07/2020** Start of operation: **12/2020** Inclusion in the system: **12/2020**
39	Upgrade of physical protection of DESFA facilities - Physical Safety Control Center	1.200.000	Final Investment Decision**: 07/2020** Start of operation: **12/2021** Inclusion in the system: **12/2021**
40	Improvement of metering accuracy in NNGTS stations	390.000	Final Investment Decision: **Taken** Start of operation**: 09/2020** Inclusion in the system: **12/2020**
41	Replacement of Metering and Supervision/ Control systems at NNGTS M and M/R stations of NNGTS	4.500.000	Final Investment Decision: **07/2020** Start of operation: **08/2022** Inclusion in the system: **10/2022**
42	New building for DESFA's headquarters	13.500.000	Final Investment Decision: **09/2020** Start of operation**: 12/2022** Inclusion in the system**: 12/2022**
43	Technical Training Centre in Nea Mesimvria	1.600.000	Final Investment Decision: **07/2020** Start of operation: **09/2021** Inclusion in the system: **09/2021**
44	Increment of the back-up power availability at Revithoussa LNG Terminal	3.500.000	Final Investment Decision: **07/2020** Start of operation: **03/2021**

			Inclusion in the system: **03/2021**
45	NNGS Modernization projects- 4th Compilation	491.880	Final Investment Decision: **Taken** Start of operation: **12/2020** Inclusion in the system: **12/2020**
46	Upgrade of LNG and O &M Facilities for energy saving	2.000.000	Final Investment Decision: **07/2020** Start of operation: **12/2021** Inclusion in the system: **12/2021**
47	Cathodic Protection System Upgrading	2.000.000	Final Investment Decision: **Taken** Start of operation: **01/2023** Inclusion in the system: **01/2023**
48	Hydraulic Simulation Software of NNGS upgrade in real time	412.000	Final Investment Decision: **Taken** Start of operation: **09/2021** Inclusion in the system: **09/2021**
49	IT Transformation	7.000.000	Final Investment Decision: **07/2020** Start of operation: **Phase 1: 1/ 2021, Phase 2: 1/2022** Inclusion in the system: **Phase 1: 1/ 2021, Phase 2: 1/2022**
50	Upgrade of LNG Facilities	270.000	Final Investment Decision: **12/2020** Start of operation: **03/2021** Inclusion in the system: **03/2021**
51	New Integrated Information System for Natural Gas Upgrade	300.000	Final Investment Decision: **Taken** Start of operation: **07/2020** Inclusion in the system: **08/2020**
	Subtotal	**510.505.880 €**	

	B. PROJECTS NOT INCLUDED IN THE 3YR DEVELOPMENT PERIOD	
	I. PLANNED PROJECTS Projects for the interconnection of NNGS with other interconnected systems (connection/development projects)	**COST(€)**
1	Connection of the FSRU of Alexandroupolis	10.000.000
2	M/R Station for connecting South Kavala UGS	7.500.000
	Projects for the connection of Users	
3	Construction of high pressure pipeline Mavromati (Vagia) - Larymna and the necessary Metering Station for the connection of LARCO GMM SA with NNGS	17.500.000
	Subtotal	**35.000.000 €**

Total	**545.505.880 €**