

# The New Gas Market in Greece and SE Europe: ssLNG the new “big wave” in the regional market

**Tatiana Eleftheriadou**

Business Development Expert

***The Pivotal role of Energy in Economic Development***

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# The Hellenic Gas Transmission System Operator

DESFA owns and operates the Greek National Natural Gas System (NNGS), which consists of the **National Natural Gas Transmission System** & the **LNG Terminal on the island of Revithoussa**.

## National Natural Gas Transmission System`

Established in  
March 2007



Backed by leading European TSOs



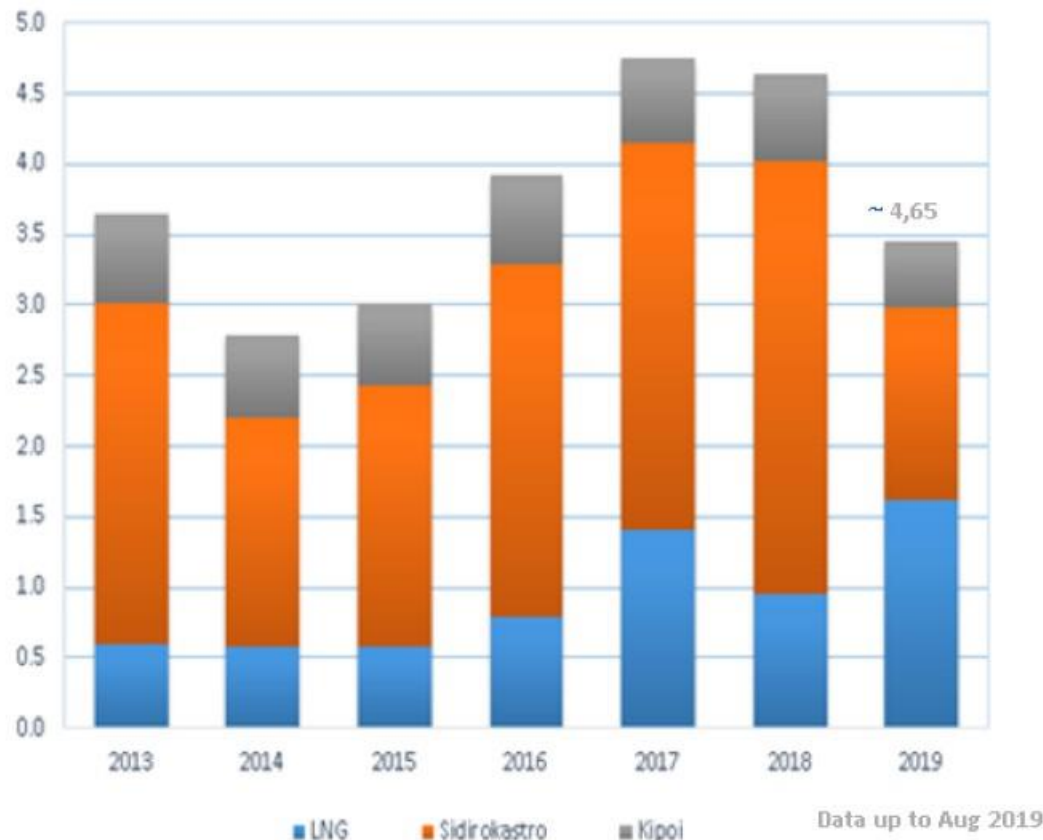
## NNGS

Total network length: **1.466 km**

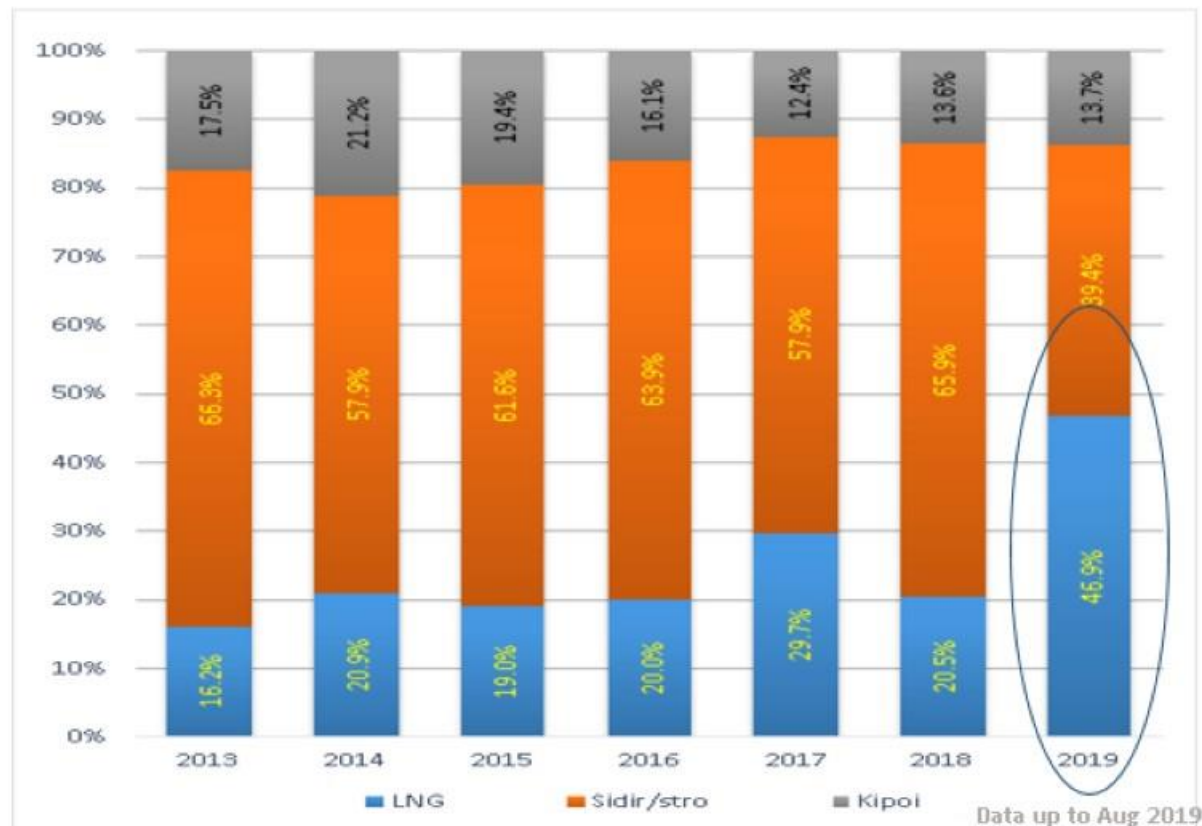
- 6** Operation & Maintenance Centers
- 51** Metering & Regulating stations
- 2** Border Metering Stations
- 2** Control & Dispatching Centers
- 1** **LNG Terminal**
- 1** Compression Station
- Remote Control & Communication System

## Greek NG market overview \_ Historical data

Annual NG consumption in bcm



Proportion of LNG in the Annual NG consumption



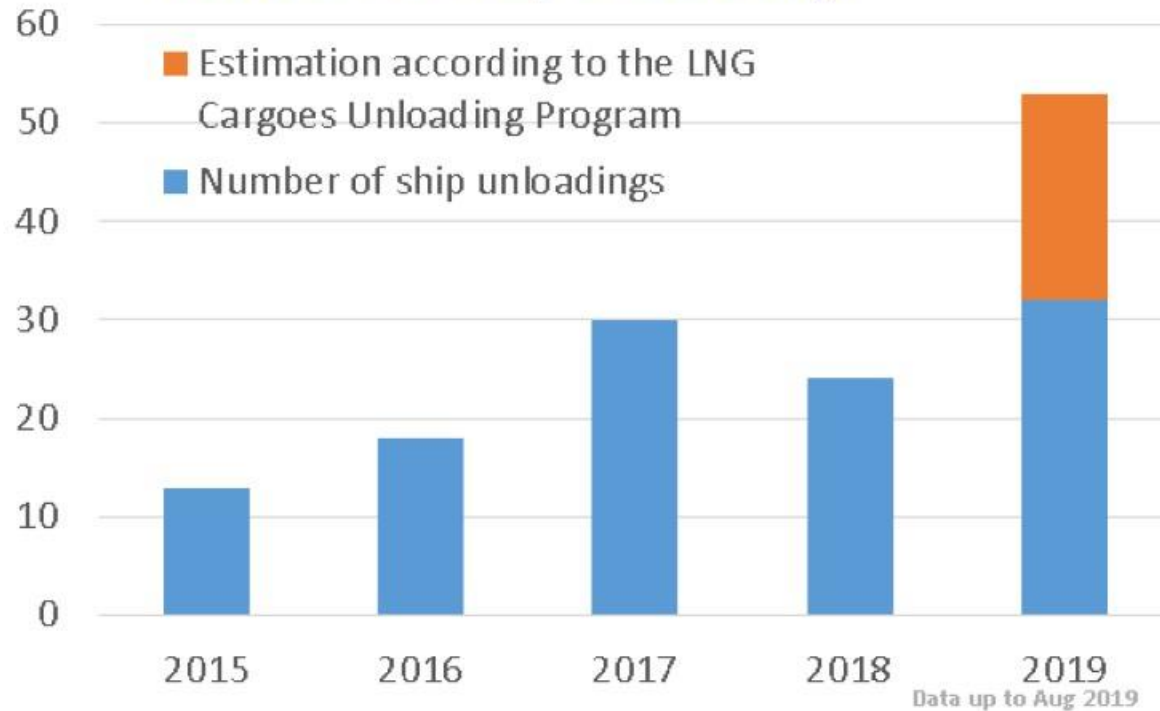
Proportion of LNG: Jan-Nov 2019 ~ 50%

- NG demand is expected to rise due to lignite units withdrawal
- LNG becomes the new market trend



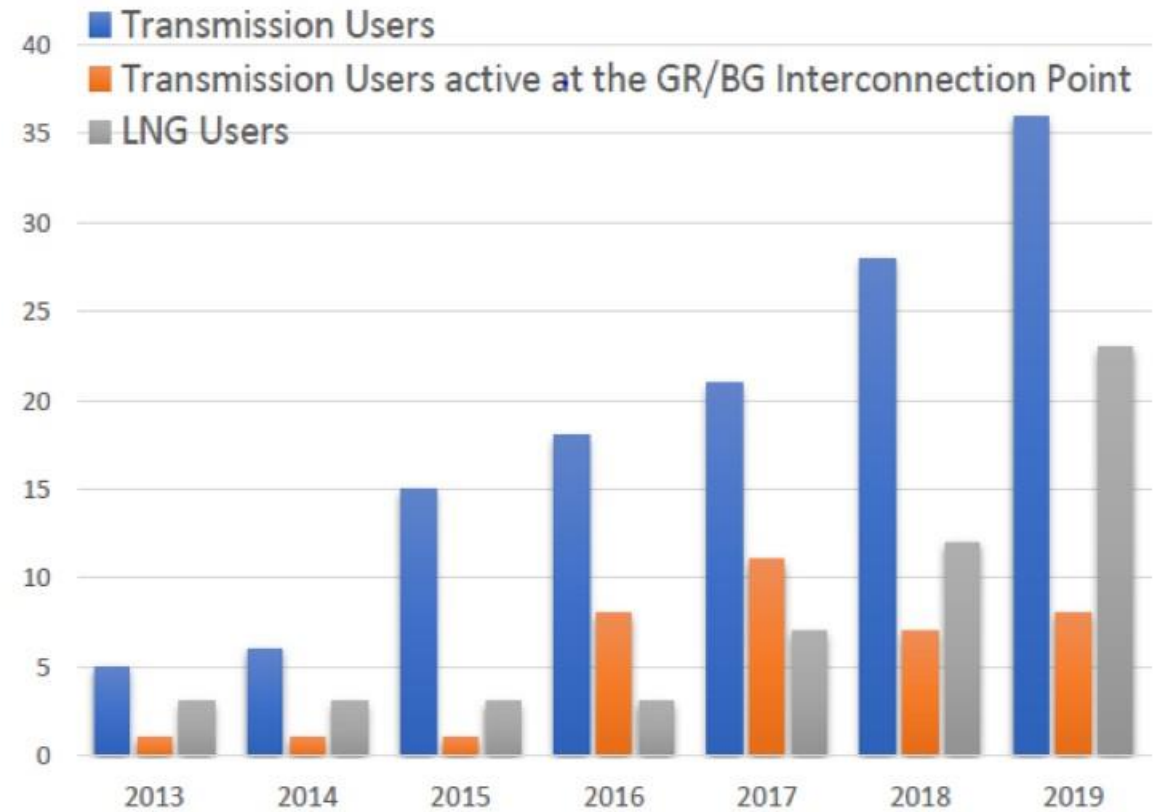
## Revithoussa LNG Terminal\_Historical Data

### Number of Ship Unloadings



**18 years (2000-2018): ~ 504 ships unloadings**

**1 year (2019): ~ 60 ships unloadings (which represents almost 50% of the total import volumes of 2019)**



Number of users in the DESFA system 2010-2019



✓ **1st unloading 3/2/2000**

## Small scale LNG becomes the “big wave” in the regional natural gas market

### Current status & Potential

ssLNG is currently a niche market, but already profitable and scalable in North-Western Europe. The market has great potential, due to increasingly environmental friendly regulation for lower carbon energy footprint and the industry's ability to unlock new seams of consumption. Demand is likely to grow rapidly to meet the needs of sea and road transportation for greener fuels. ssLNG also enjoys advantages in addressing off-grid insular power generation and industrial and residential needs in remote locations.

### Small going big

**Greece is emerging as a prominent location for LNG bunkering**, mainly for three reasons:

- is a material bunkering market today, supplying roughly 1% of global bunkering demand
- receives LNG cargoes from multiple sources and diversified routes which enhances security of both large- and ssLNG supply
- The use of LNG as marine fuel will provide local & regional environmental benefits from lower polluting emissions.





## How is DESFA promoting new uses of natural gas (ssLNG)

DESFA is committed to the promotion of new uses for natural gas, through small scale LNG utilization and particularly in the maritime sector (LNG bunkering) and power generation (virtual pipeline)

### VIRTUAL PIPELINE

### CRETE

- The use of LNG as a complementary source of power production in the island will increase the reliability of the system and ensure the security of energy supply in case of failure of the larger offshore cable
- Additionally, LNG might be used as fuel in the industrial zone of Crete and hotels (LNG transported with trucks) as well as for marine bunkering.

Current budget € 175 Million

Current  
Status

Under feasibility  
study

### VIRTUAL PIPELINE

### CRETE

Besides the virtual pipeline to Crete, another similar project is being investigated for the power generation of Dodecanese and North Aegean islands





## How is DESFA promoting new uses of natural gas (ssLNG)

DESFA is at the final stage of maturing the projects for the truck loading station and the small scale LNG jetty in Revithoussa. These projects will allow the demand of small scale LNG to start in Greece and in neighboring countries, enabling new investments in the maritime sector, in the transportation and off grid applications.



Bunkering  
Truck to Ship  
& off grid  
supply

Truck loading station

One loading bay with loading capacity of 100 m<sup>3</sup>/h. Provision for a future second bay



Bunkering  
Ship to Ship  
& virtual  
pipeline

Small Scale LNG jetty  
vessels from 1.000 m<sup>3</sup> to  
20.000 m<sup>3</sup>)

**Current budget € 6,5 Million**

Basic design has been completed. Tendering procedure for awarding the construction of the station is in process (Offers and are under evaluation)

**Current budget € 34 Million**

Basic design has been completed. Environmental & Social Impact Assessment (ESIA) has been submitted to the Ministry of Environment & Energy for approval



## DESFA promotes LNG bunkering by being the Technical Coordinator of PMII, a key EU project with regional impact

### Scope of work

**Studies for maturing the adoption of LNG as marine fuel in East Mediterranean**, addressing all aspects of the supply chain:

- Designs for small scale LNG infrastructure at ports and Revithoussa LNG terminal
- Shipyards assessments
- Feeder and bunkering vessels design
- LNG powered vessels design (new construction and retrofits)
- Economic and price pattern studies
- Regulatory gap analysis

- **Natural gas sector**
- **Maritime sector** (port authorities, shipping companies, classification societies & naval architects)
- **Consulting engineering sector**
- **Financing advisory sector**



Partners: 26



Budget  
~€53M

DEPA: PMII Coordinator

6 Ports  
&  
1 LNG  
Terminal

3 Countries  
Greece  
Italy  
Cyprus



Duration  
June 2015 /  
December 2020



Co-financed by the Connecting Europe  
Facility of the European Union

## Poseidon Med II

### Patras ssLNG facilities

Storage Capacity	3,000 m <sup>3</sup> (+ 1 empty tank of 1000m <sup>3</sup> for safety reasons)
Regasification Unit	Yes
LNG Vessels Capacity	1,000 up to 20,000 m <sup>3</sup>
Truck Loading Slots	4
CAPEX (Preliminary)	62,000,000 €

### Igoumenitsa ssLNG facilities

Storage Capacity	4,000 m <sup>3</sup> (+ 1 empty tank of 1000m <sup>3</sup> for safety reasons)
Regasification Unit	Yes
LNG Vessels Capacity	1,000 up to 20,000 m <sup>3</sup>
Truck Loading Slots	2
CAPEX (Preliminary)	48,000,000 €



**Studies  
for Ports**

Patras, Igoumenitsa, Heraklion

Piraeus will be served by bunkering vessels from Revithoussa

- conceptual design completed (all ports)
- FEED study for cryogenic installations has started
- engineering design for port infrastructure under execution

### Heraklion ssLNG facilities

Storage Capacity	2,000 m <sup>3</sup> (+ 1 empty tank of 1000m <sup>3</sup> for safety reasons)
Regasification Unit	No
LNG Vessels Capacity	1,000 up to 20,000 m <sup>3</sup>
Truck Loading Slots	2
CAPEX (Preliminary)	45,000,000 €



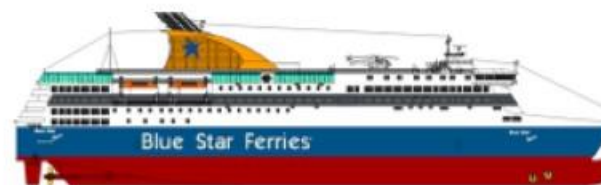


### Designs of Vessels

- LNG fuelled vessels (new builds & retrofit)
- LNG bunkering and feeder

- Engineering design for LNG bunkering vessel (1.000 m<sup>3</sup>) and LNG feeder vessel (6.000-7.000 m<sup>3</sup>)
- Engineering design for 10 LNG powered retrofits

### Blue Star Ferries LNG Ro/Pax Ferry: Innovative design



INNOVATIVE  
COMPACT  
RO/PAX VESSEL  
135 m

Innovative engineering design of a newbuild LNG fuelled RoPax ferry: The innovation in both the operation and design of the vessel focused on minimizing its carbon footprint and on achieving fuel efficiency. The design work of the vessel was executed within the framework of PMII



Co-financed by the Connecting Europe  
Facility of the European Union

The Small-Scale LNG database released by Gas Infrastructure Europe in 2018, provides an overview of the available, planned and announced small-scale LNG infrastructure in Europe.

### Key findings

“Small Scale LNG Infrastructure is heavily dependent on the proximity of Large Scale LNG import terminals, which are the key logistical springboard for small scale LNG infrastructure”.

## Piraeus among major bunkering ports in the world

Piraeus will be served by bunkering vessels from Revithoussa





## Prons & Cons of LNG as marine fuel

LNG is currently the only available fuel that can provide compliance with IMO targets up to 2040

- ✓ Environmental benefits
- ✓ Socio- economic benefits (Human health, new job opportunities, ports' competitiveness, boost of local economies )
- ✓ Security of supply (fuel availability), Large Scale LNG import terminals competitive advantage (GIE Europe, SSLNG Database 2018), storage capacity 225.000cm<sup>3</sup>, proximity to the core port of Piraeus
- ✓ Infrastructure design (PMII Project)
- ✓ Regulatory framework (Presidential Decree for LNG bunkering in Greece), PMII Project contribution

### ➤ Investment

## Energy transition, reducing shipping environmental impact: support schemes & grants

### Government policy design critical

Realizing the potential of natural gas requires consistent support and coordinated action by industry and national governments: we need to **incentivize shipping's decarbonization** and the exercise requires strong cooperation between private and public sector.

"The transport sector provides the greatest long-term growth opportunity in Greece and all EU markets, but depends on policy support to promote consumption and infrastructure development".

- Lower carbon energy footprint is required to accelerate and enable an **effective long-term response to climate change**.
- Deployment of greener technologies (i.e ship retrofits or newbuilds) requires **public support schemes or grants**. Based on this experience and different maturity level of regional markets, industry should **work closely with National Authorities and EC on the design of new relative support schemes and grants**



## National Energy and Climate Plan (NECP)

Ahead of National Energy & Climate Plan (NECP) we need to provide a solution for the maritime industry that will serve not only short term (2030) but also long term (2050) targets, otherwise 2050 targets will not be achieved

2020-2030 is the most significant decade stressing the urgency for early action

### Incentives (indicatively)

- Small scale LNG infrastructure at Revithoussa LNG terminal, first link of the supply chain (RAB)
- Incentives for Green ships at ports
- Integrate climate-change into lending decisions for ship owners
- Friendly taxation policies.
- facilitating ssLNG infrastructure licensing

Energy and climate are the two crucial factors on which the future of our society rests. In the past it was markets that dictated the direction of progress. Today it is the urgent need to protect the environment.



***t.leftheriadou@desfa.gr***

*tel: +30 2130884067, mob: +30 6944 304209*



*Thank you for your attention!*

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