

# LNG perspectives as Marine Fuel in East Med



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# Content

- I. LNG as Marine Fuel
- II. Poseidon Med II Project
- III. Benefits & Perspective

# Content

I. LNG as Marine Fuel

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III. Benefits & Perspective

# International regulation on the emissions control



## Ships trading...

...in ECA have used fuel oil with a sulphur content of no more than 0.10% since 1 January 2015.

...outside ECAs, the current limit for sulphur content of fuel oil is 3.50%, falling to 0.50% m/m on after 1 January 2020



## Why LNG?



**Safe and proven technology;**  
safe usage, storage  
& transportation



**Cost-effective fuel available** today-  
Viable and sustainable  
solution



**Environmentally friendly:**  
lower CO<sub>2</sub>, NO<sub>x</sub>, SO<sub>x</sub>  
and PM emissions



**Economies of scale and synergies**  
with power and energy markets



# Liquefied Natural Gas: General Properties



## Gas

Cooled to approx -162 C



**Easy transferred and stored**  
1/600 space of gas



## Less Emissions

Main component methane (CH<sub>4</sub>)



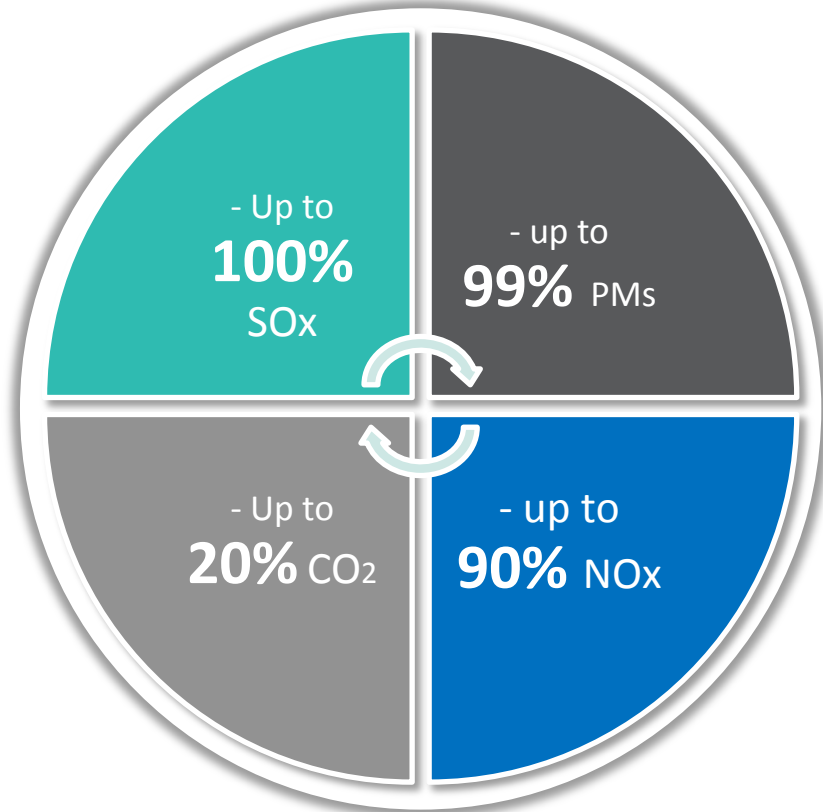
## Efficient

High Thermal



## Environmental Friendly

Clear, odorless, colorless, non toxic





# LNG Era; An Emerging Market

Improvement of the  
ports competitiveness

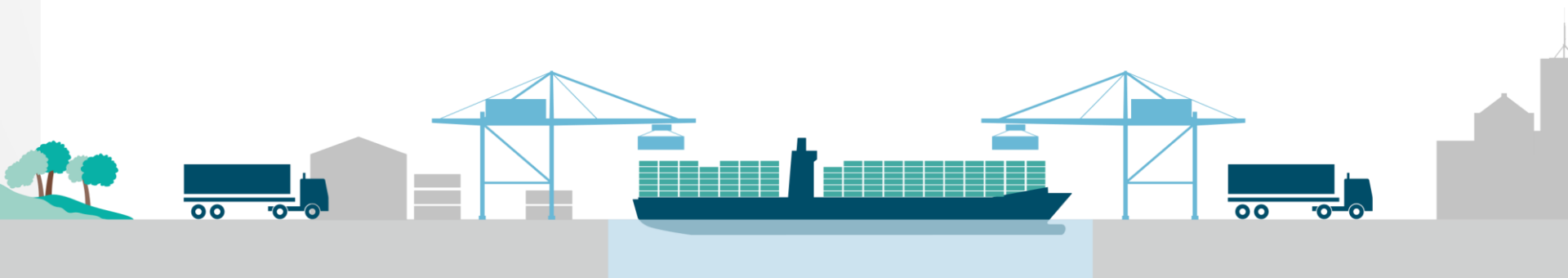
Know-how; Vessels  
installations and LNG  
infrastructure

Investment into LNG  
Infrastructure

New Market & New  
jobs

Strengthen Greece'  
leadership in shipping

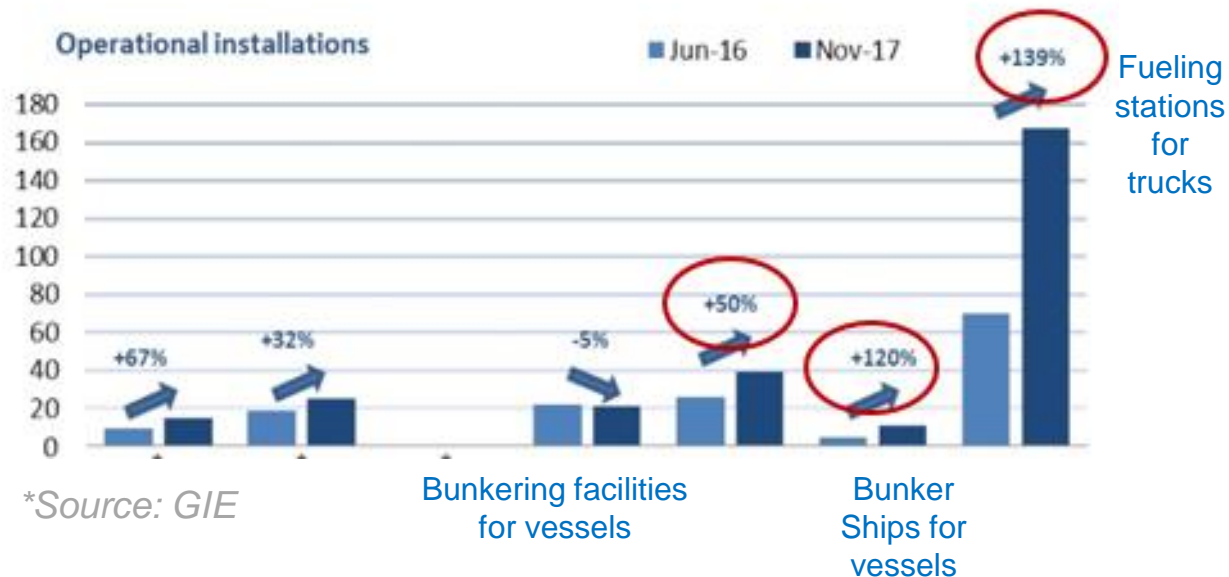
Boosting Hellenic  
shipbuilding sector





## Small-Scale LNG infrastructure in Europe

- 75% of operational SSLNG infrastructure were in countries with large scale regasification terminals (Western Europe).
- LNG fuelling stations for trucks; both the number of operational stations as well as the number of under construction and planned stations have more than doubled to 167 and 71 respectively.
- Sea and river SSLNG infrastructure projects has also grown, moving from 31 to 50 over 2016-2017 (+62%), while the pipeline of new under construction or planned projects showed a slight decline from 37 to 31 (-16%).

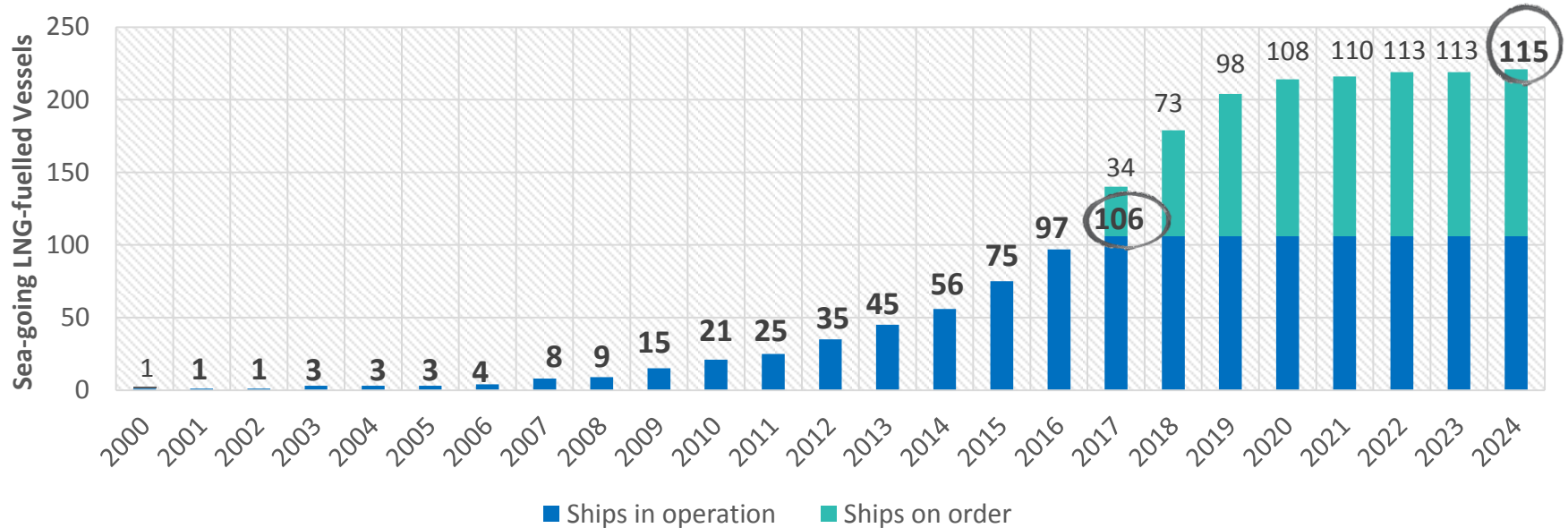






# LNG fuelled Vessels

There are currently 221 confirmed LNG ship fuel projects



Source: DNV-GL, May 2017

Excluding LNG carriers & inland waterway vessels

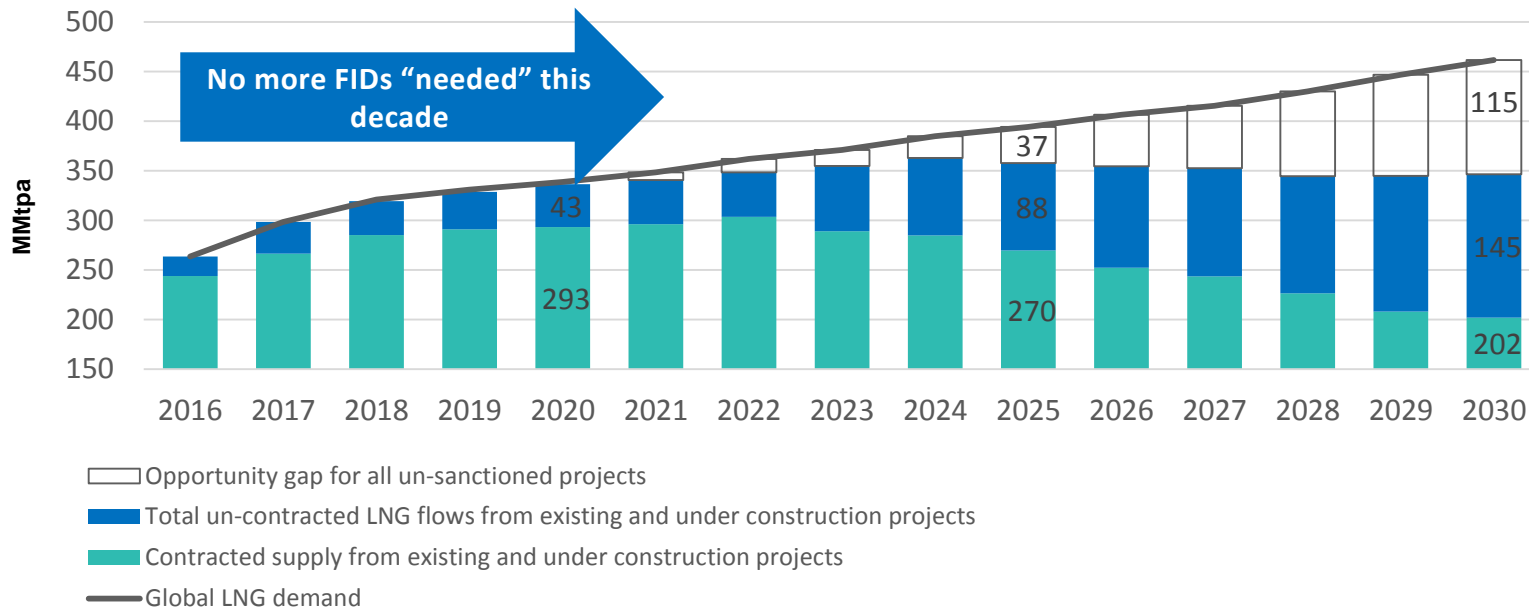
106 LNG fuelled ships in operation worldwide today

115 confirmed LNG fuelled newbuilds in 2024



# Supply – Demand Balance

Contracted supply and viable un-contracted supply versus global LNG demand



Note: MMtpa = Million metric tons per annum of LNG. Does not include market-driven underutilization from global projects  
© 2016 IHS

## Buyer's market

Reduced capacity utilisation 80%-90% vs. 88% in the period of 2000-2016

## CMA CGM to Power Its 22,000 TEU Giants with LNG



French shipping major CMA CGM Group has unveiled the decision to equip its nine future ships of 22,000 TEUs with engines using liquefied natural gas.

"We have made the decision to equip its nine future ships of 22,000 TEUs with engines using liquefied natural gas."

## MSC and Moby order LNG-ready ro-pax newbuild vessels from GSI



MSC and Moby have ordered four LNG-ready ro-pax ferry/cruise vessels, plus options for up to four more, from GSI Shipyard in China.

The four newbuilds will have 3,765 m of linear capacity and be able to accommodate 2,500 passengers. Two of the vessels are

## MOL orders LNG-fueled tugboat



Image courtesy of MOL

Japan's Mitsui O.S. Line ordered a liquefied natural gas (LNG) fueled tugboat at Dockyard.

According to the MOL, the vessel is set to be completed by early 2019.

The launching of the vessel in 2019, MOL said, noting that the first tugboat with engines running on LNG will be manufactured by Yan.

## World News

latest features world

Home > News & Features > World > China Boasts a Gas-Fueled Fleet of 275 as Bullish Outlook for LNG B

## China Boasts a Gas-Fueled Fleet of 275 as Bullish Outlook for LNG Bunkering Continues

Monday March 26, 2018

Share in Share Tweet Follow 6,118 followers

2018's bullish outlook for liquefied natural gas (LNG) bunkering continues this week courtesy of several recent reports highlighting increased interest and adoption for the emerging marine fuel.

Among those was a report by Interfax quoting Ji Yongbo, a researcher at the China Waterborne Transport Institute, who last week spoke at a



In the Press

## World's first LNG-fuelled bulk carrier delivered.

## Rotterdam: Less fuel oil and more LNG bunkered in 2017

in Port News 20/02/2018

In 2017, the sale of bunker oil – fuel for shipping – in the Rotterdam bunker port diminished from 10.1 million m<sup>3</sup> to 9.9 million m<sup>3</sup>. Bunkers contain fuel oil, in 2017, 8.3 million m<sup>3</sup>. The throughput of bunkered liquefied natural gas (LNG) – liquefied natural gas – increased from less than 100 tonnes to 1500 tonnes.



## EMSA – New guidance on the use of LNG as a ship fuel

Maritime Cyprus admin / February 13, 2018



Guidance on LNG Bunkering European Maritime Safety Agency

## Carnival Orders Third LNG-Fuelled Ship for Its AIDA Brand



Image Courtesy: Carnival Corp

Carnival Corporation & plc has signed a shipbuilding contract for a third next-generation cruise ship for its Germany-based AIDA Cruises brand.

Scheduled for delivery in 2023, the new 180,000-ton ship, being built by German shipbuilder Meyer Werft GmbH at its shipyard in Papenburg, will feature Carnival's "green cruising" design. The ship will also be fully powered at sea and in port by liquefied natural gas (LNG).

## TOTE Completes First Phase of Vessel Conversion to LNG-Fuelled Propulsion

Tuesday February 27, 2018

Share in Share Tweet Follow 6,118 followers

TOTE Maritime Alaska (TOTE) says it has completed the first of four conversion periods for its Orca class vessels, which will enable the ships to use liquefied natural gas (LNG) as fuel.

The company explains LNG tanks and critical engine updates necessary to utilise LNG as a fuel were completed during the initial phase of the planned four year process.

TOTE Maritime's vessel North Star arrived in Anchorage on Sunday after completing its first voyage with two LNG tanks fitted behind the ship's bridge.



TOTE Maritime's North Star has been fitted with two LNG tanks behind the ship's bridge. Image Credit: TOTE

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# Poseidon Med II

Poseidon Med II is a key European project aiming to take all the necessary steps towards adoption of LNG as marine fuel in the Eastern Mediterranean Sea, while making Greece an international marine bunkering and distribution hub for LNG in South Eastern Europe.



**Duration:**  
Jun.2015 – Dec.2020



**Budget:** ~€53M



**Partners:** 26



**Coordinator:** DEPA



**Technical Coordinator:** DESFA



**Co-financed:**  
50% by EU - CEF



# Poseidon Med II

## 3 Countries

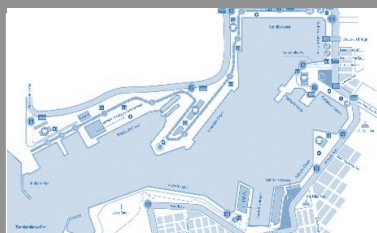
Greece  
Italy  
Cyprus

## 6 Ports

Piraeus  
Patra  
Heraklion  
Igoumenitsa  
Limassol  
Venice



# Activities



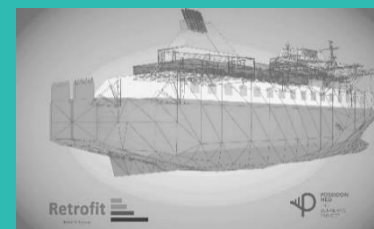
## 01

### Studies for Ports

Infrastructure at Revithoussa LNG terminal -  
LNG infrastructure at 5 ports -

## 02

### Designs of Vessels



- LNG fuelled vessels (newbuilds & retrofit)
- LNG bunkering and feeder

Adaptation of regulatory framework -  
Environmental impact assessment -

- Financial assessment
- Financial tools for investments

Synergies



## 03

### Regulation

## 04

### Financial



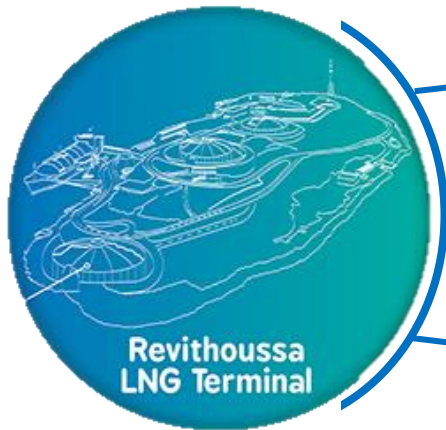




# Small Scale LNG Infrastructure

## LNG Terminal

From the LNG Import Terminal  
(Revithoussa)



## Transportation

LNG is being transported with  
feeder/bunkering vessel or  
trucks



## Consumption

To the consumers, that could be



LNG storage tanks



Vessels users



Industry





# Partners



# Progress on ports & LNG Terminal Infrastructure

Hazard  
Identification  
(HAZID)  
& Risk assessment  
studies at ports

Preliminary  
Engineering  
Design  
for the Pilot Truck  
Loading Station

Supporting  
Studies for ports;  
Bathymetric,  
Wave,  
Navigation

Technical  
Feasibility  
and Cost Estimate  
Study  
for Revithoussa

Site planning  
for LNG bunkering  
infrastructures  
in ports





# Progress on Vessels Designs



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## Greece; Specific needs



➤ **2.500** islands

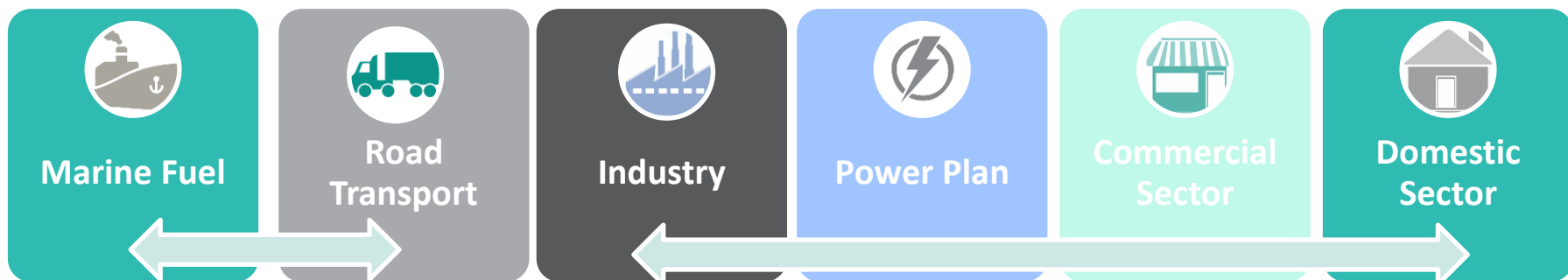
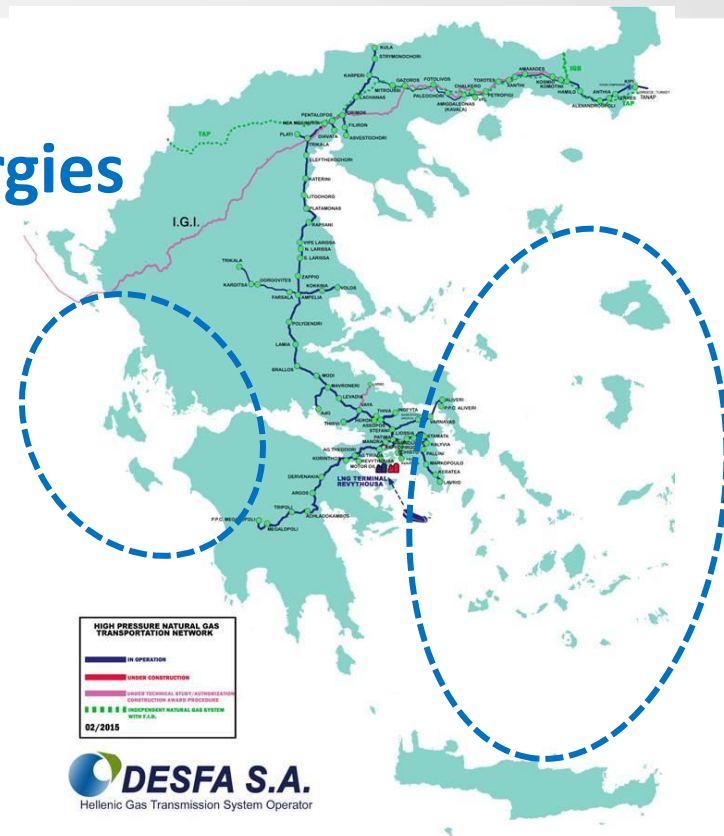
➤ **165** inhabited

➤ **53** islands > 1.000 population

➤ **162** ports

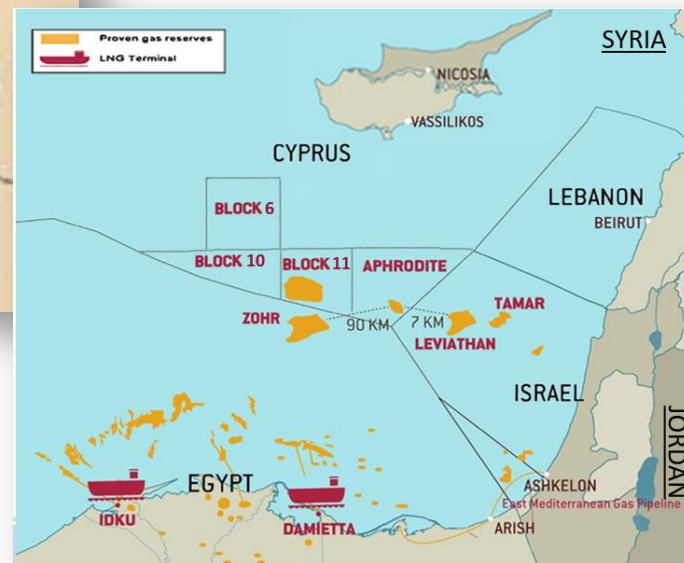
# SSLNG Infrastructure - Synergies

High density residential areas & large industrial & commercial customers in Western Greece & the Islands without access to Natural Gas

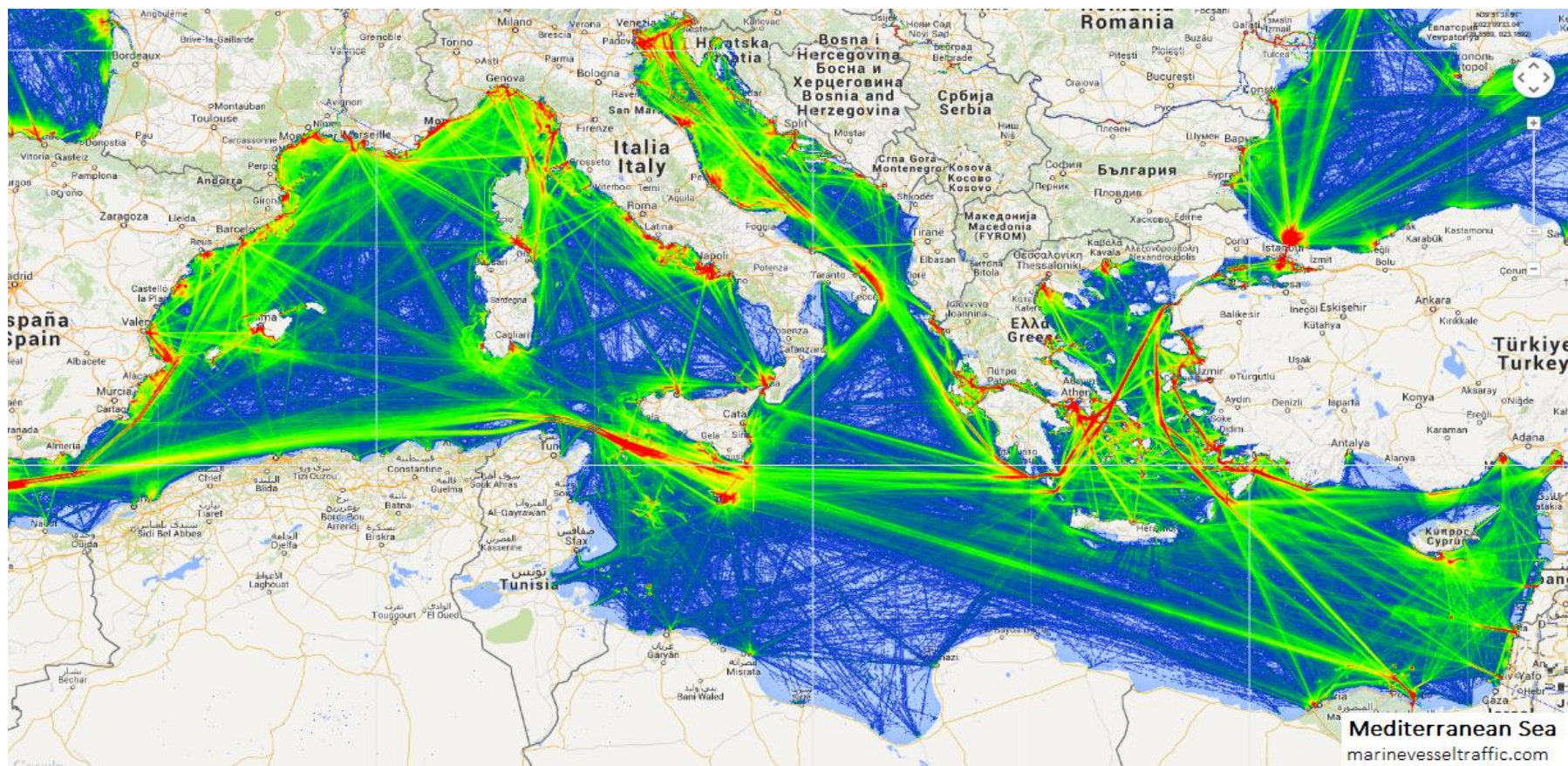




# East Mediterranean: Gas Rich Area

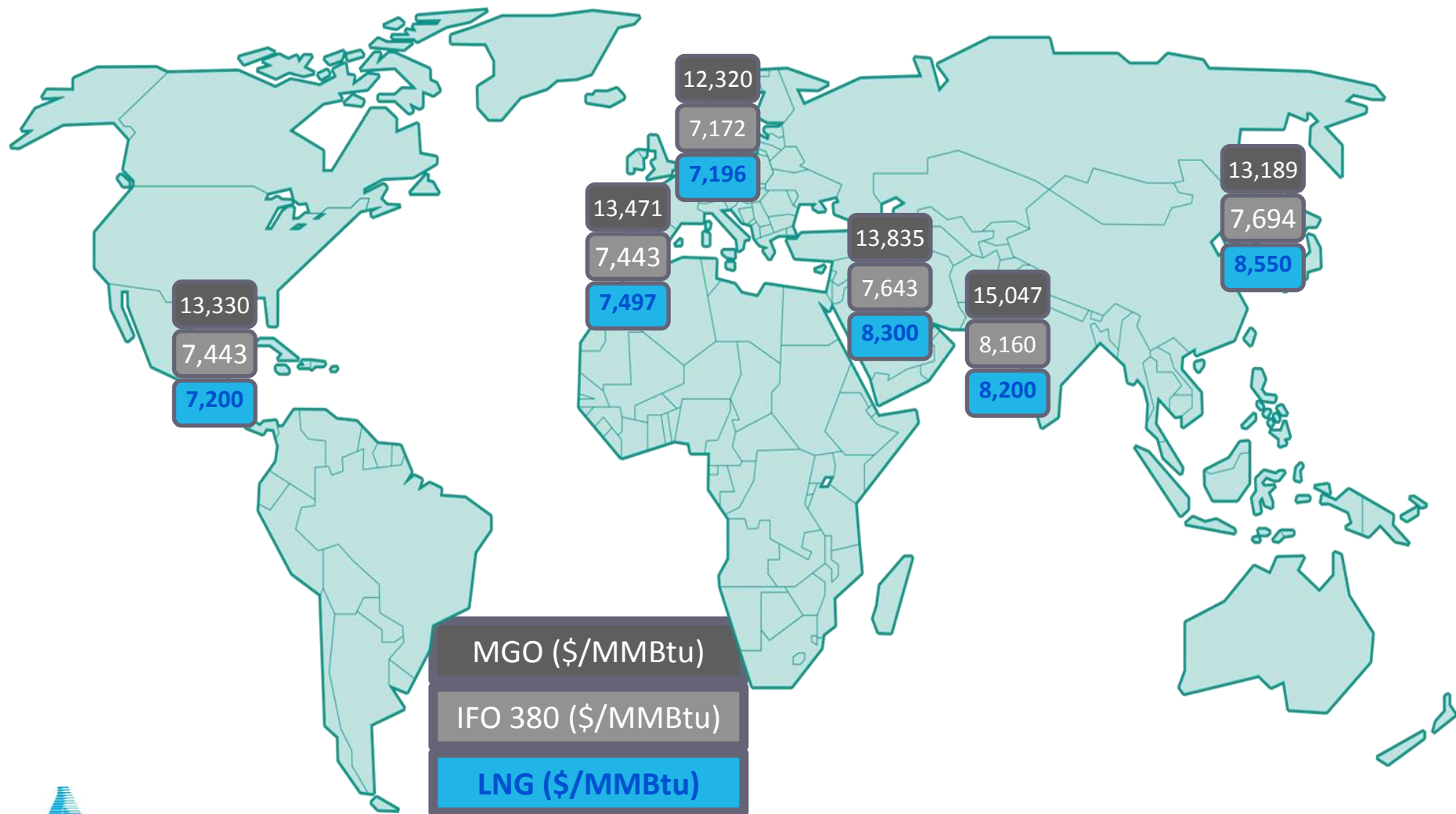


# East Mediterranean: Shipping Traffic



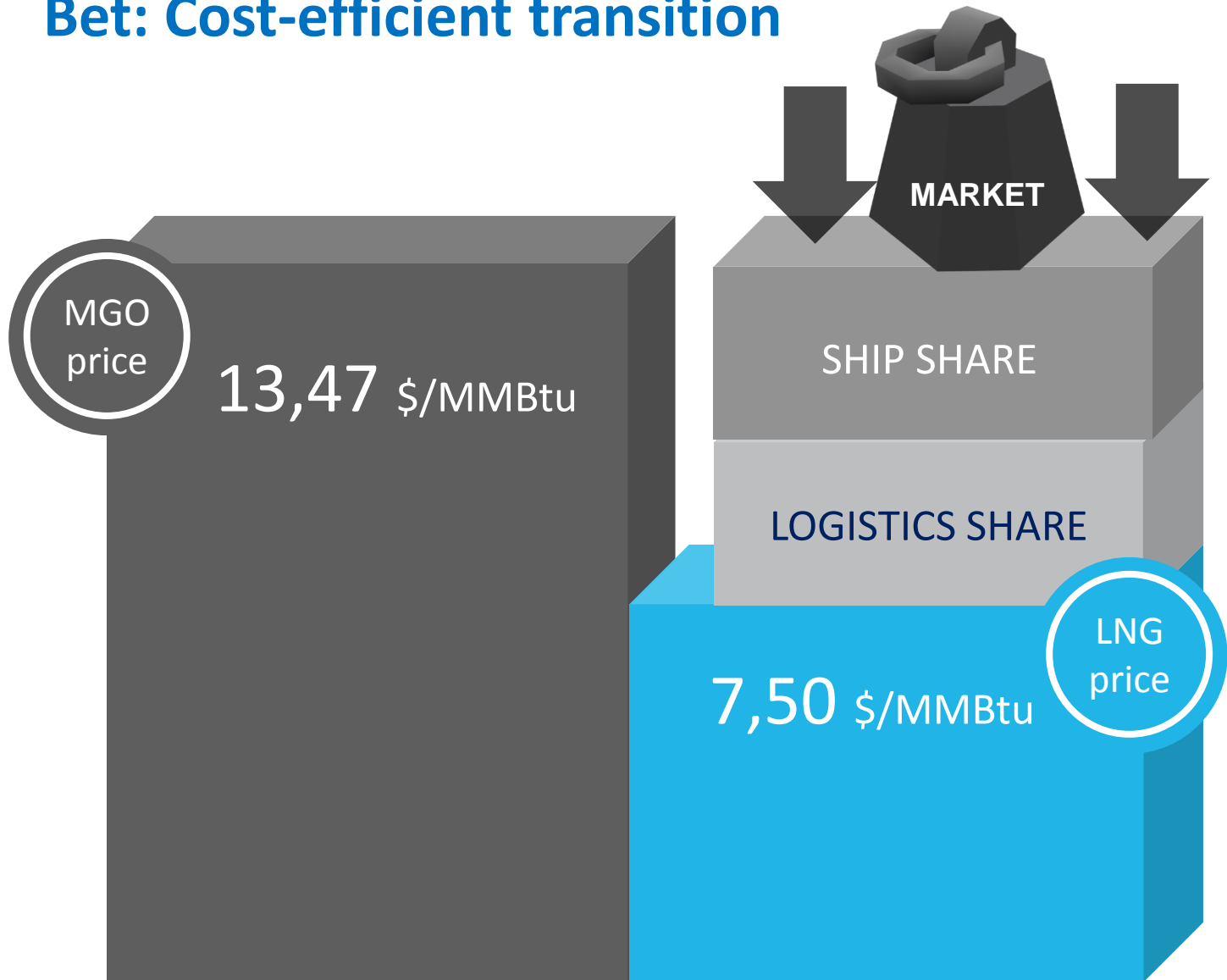


# Current Marine Fuel prices vs LNG prices





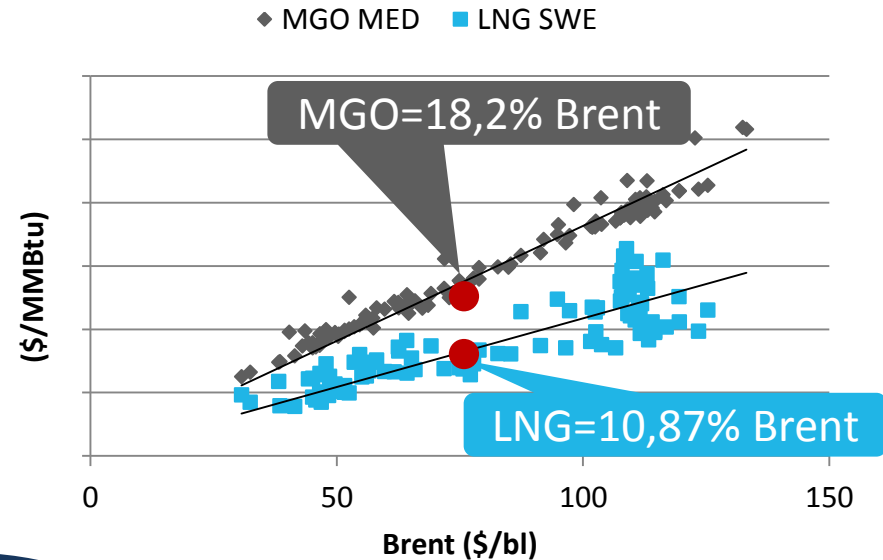
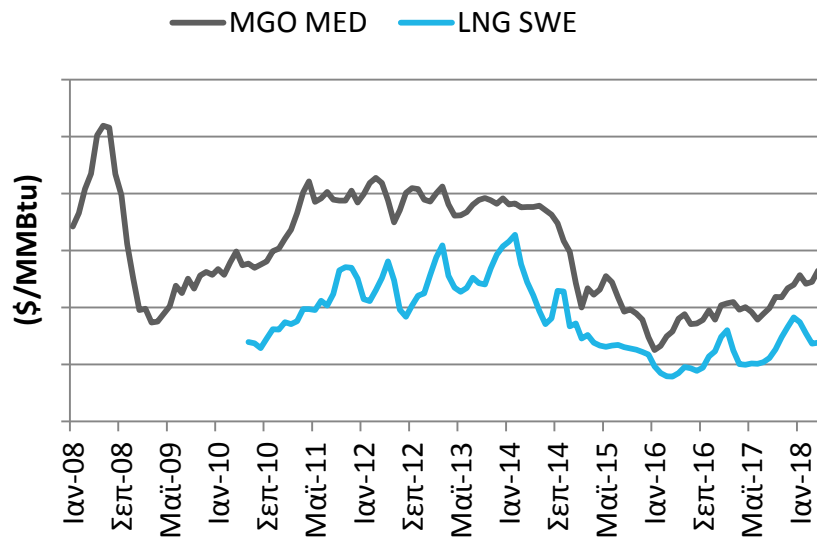
## Bet: Cost-efficient transition





# Long Term Price Comparison

Last Decade



Today

MGO = 18,76 Brent

LNG = 10,45 Brent

# Thank you!

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