

PMII: A collective effort with regional impact towards the adoption of LNG as marine fuel

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- *Round Table on “LNG Developments and Use for Maritime Transport in the Adriatic- Ionian Region”*
- *Parallel Session “Energy Networks for Development and Market Integration*

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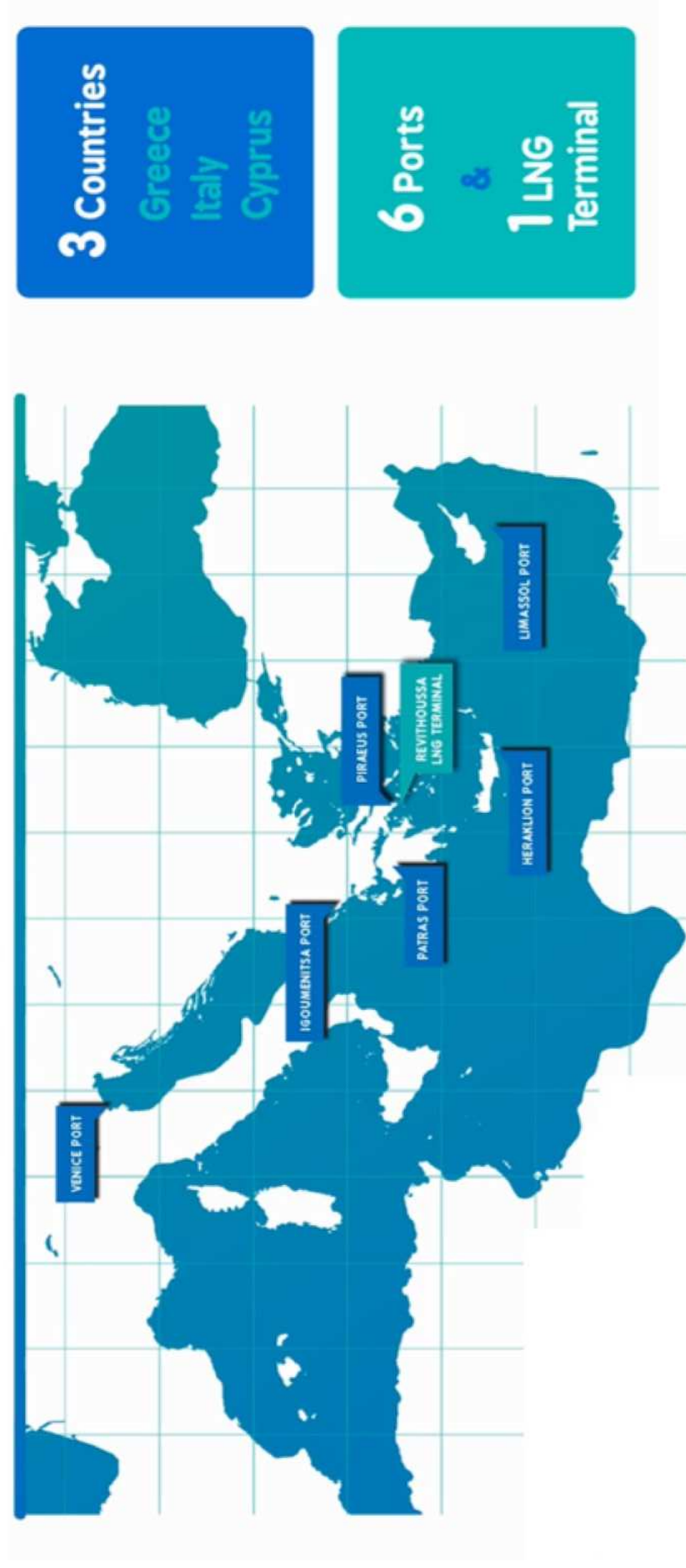
PMII is a key European Project aiming to take all the necessary steps towards adoption of LNG as marine fuel in the Eastern Mediterranean Sea, while making Greece an international marine bunkering and distribution hub for LNG in South Eastern Europe

 Duration: Jun.2015 – Dec.2020	 Budget: ~€53M	 Partners: 26
 Coordinator: DEPA	 Technical Coordinator: DESFA	 Co-financed: 50% by EU - CEF





PMII is a partnership between 3 Mediterranean countries (Cyprus, Greece and Italy), which involves 6 European ports (Piraeus, Patras, Igoumenitsa, Heraklion, Limassol, Venice) and 1 LNG Terminal (Revithoussa LNG terminal)



PMII Partners

26 business experts from the maritime, energy & financing sector have joined forces, knowledge & experience to formulate all technical, financial regulatory and operational factors for the adoption of LNG as marine fuel



LNG Advantages



Safe and proven technology:
safe usage, storage & transportation



Cost-effective fuel available today-
Viable and sustainable solution



Environmentally friendly:
lower CO₂, NO_x, SO_x and PM emissions



Economies of scale and synergies
with power and energy markets

PMII engages all related activities towards a competitive investment framework for LNG bunkering operations



Studies for Ports

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

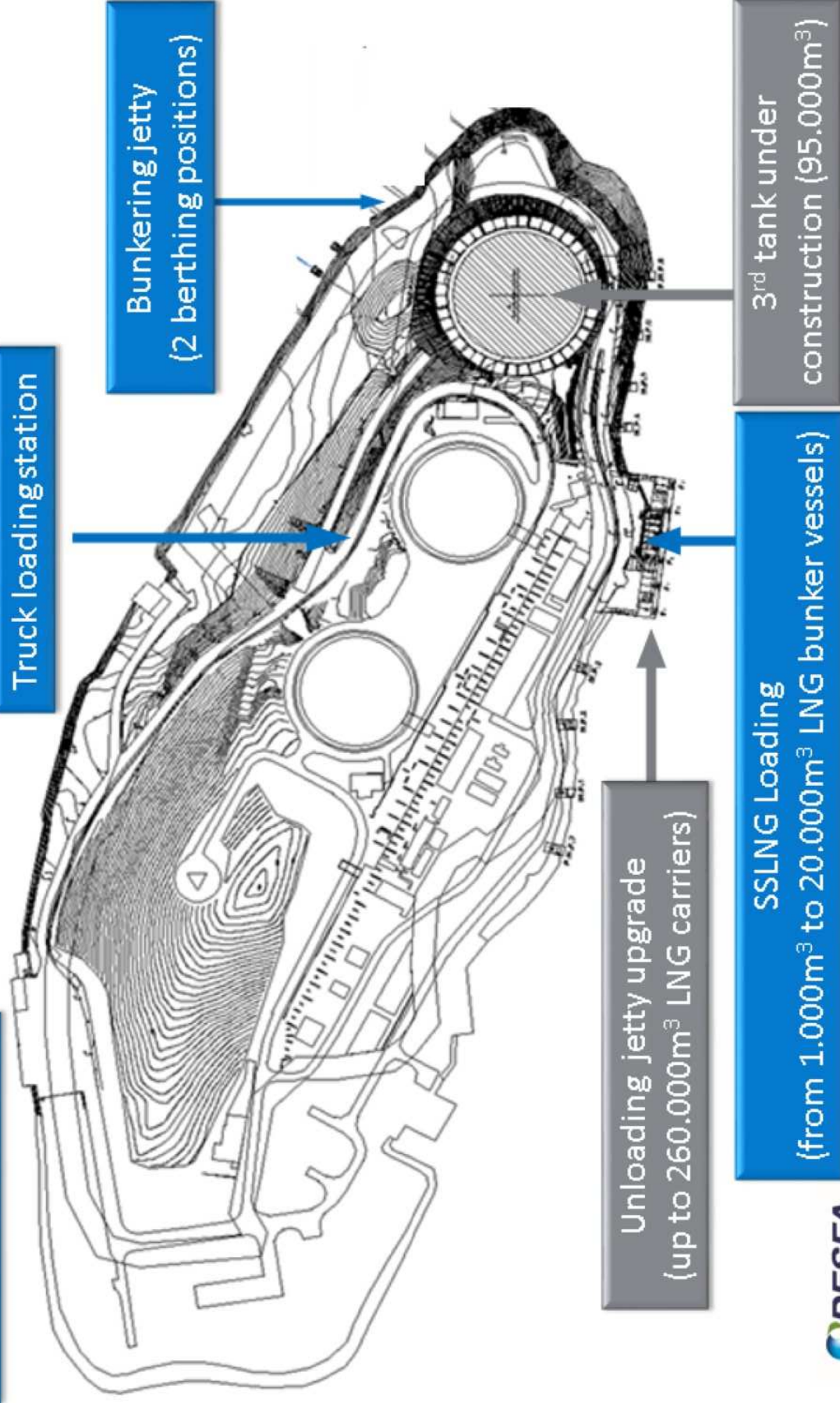


Designs of Vessels

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

Revithoussa LNG Terminal

Small Scale LNG (SSLNG) Initiatives



Progress on Small Scale LNG initiatives on Revithoussa LNG Terminal

- Bunkering jetty: Basic Design awarded in March 2018, expected finish end 2018, expected commissioning 2022
- Interim solution under study (loading arm added to the existing jetty)
- Truck loading station: EPC tender, Bid due date: 21st of June 2018, expected commissioning January 2020



„P² Revithoussa LNG Terminal 2nd Upgrade

Availability of supply

With the completion of the 3rd tank, the storage capacity of Revithoussa is approximately equal to the annual national bunkering demand at a 10 years horizon



Regional advantages of Revithoussa on SSLNG initiatives

- Strategically positioned to provide various ports of SEE with the necessary SSLNG quantities.
- Satellite storage installations may operate as points of sales
- Open access to all users without creating constraints regarding their LNG suppliers.

TPA = Third Party Access

Revithoussa operates under third party access regime → competition ↑



Port of Igoumenitsa

- ✓ Site visit, workshop, discussions
- ✓ HAZID study
- ✓ Preliminary Environmental Impact study
- ✓ Preliminary Safety Study
- ✓ Bathymetric survey
- ✓ Wave disturbance study
- ✓ Maneuvering Simulation Study
- ✓ Conceptual design of port infrastructure
- ✓ CBA analysis
- ✓ **Master plan has been submitted to the relevant Authority (E.Σ.A.A.) for approval**

Port of Patras

- ✓ Site visit, workshop, discussions
- ✓ HAZID study
- ✓ Preliminary Environmental Impact study
- ✓ Preliminary Safety Study
- ✓ Bathymetric survey
- ✓ Wave disturbance study
- ✓ Maneuvering Simulation Study
- ✓ Conceptual design of port infrastructure
- ✓ CBA analysis
- ✓ **Master plan has been resubmitted to the relevant Authority (E.Σ.A.A.) for approval**

Progress on Ports

Port of Piraeus

- ✓ Site visit, workshop, discussions
- ✓ HAZID study
- ✓ Preliminary Environmental Impact study
- ✓ Bathymetric survey
- ✓ Wave disturbance study
- ✓ Maneuvering Simulation Study
- ✓ Conceptual design of port infrastructure
- ✓ **Addendum to Master Plan is under finalization**

Port of Heraklion

- ✓ Site visit, workshop, discussions
- ✓ HAZID study
- ✓ Preliminary Environmental Impact study
- ✓ Bathymetric survey
- ✓ Wave disturbance study
- ✓ Maneuvering Simulation Study
- ✓ Conceptual design of port infrastructure
- ✓ **Master Plan is under finalization**

Port of Limassol

- ✓ Site visit, workshop, discussions
- ✓ HAZID study
- ✓ Preliminary Environmental Impact study
- ✓ Bathymetric survey
- ✓ Wave disturbance study
- ✓ Maneuvering Simulation Study
- ✓ Conceptual design of port infrastructure
- ✓ **Master Plan has been carried out, pending approval from Cyprus Ports Authority**

Port of Patras: Key Figures

Patras Small Scale LNG Terminal	
Area	25,000 m ²
Storage Capacity	3,000 m ³
Regasification Unit	Yes
LNG Vessels	1,000 up to 20,000 m ³
Truck Loading Slots	4
CAPEX (PRELIMINARY)	60,000,000 €

Port of Igoumenitsa: Key Figures

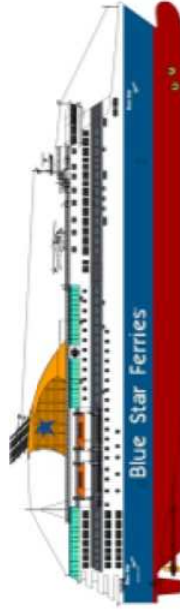
Igoumenitsa Small Scale LNG Terminal	
Area	21,000 m ²
Storage Capacity	4,000 m ³
Regasification Unit	Yes
LNG Vessels	1,000 up to 10,000 m ³
Truck Loading Slots	3
CAPEX (PRELIMINARY)	50,000,000 €

Progress on Vessels Design

Basic and detailed designs for LNG bunkering vessels and LNG retrofits; new building designs of LNG fuelled Ro/ Pax ferries; basic and detailed designs for LNG feeder vessels for the supply of LNG storage installations at ports

Blue Star Ferries LNG Ro/Pax Ferry: Innovative design

INNOVATIVE
COMPACT
RO/PAX VESSEL
135 m



Innovative Design of an 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



Regulatory Framework: International Status

- ✓ **IMO** Decision, 2016-> Global Sulphur cap of 0.5% on marine fuels starting from 2020
- ✓ **EMSA** Guidance on LNG Bunkering to Port Authorities/Administrations
- ✓ **ISO 20519**, Ships and marine technology – Specification for bunkering of liquefied natural gas fuelled vessels
- ✓ **SGMF** LNG Bunkering Safety Guidelines
- ✓ **IACS** Recommendation on LNG Bunkering Guidelines
- ✓ **IAPH** LNG bunker checklists



EU Regulatory Framework

Directive 2014/94/EC on the deployment of alternative fuels infrastructure



Installation of
LNG refuelling
points to ports
by 2025



Develop
appropriate
LNG
distribution
system



Develop
Technical
Specifications
for LNG
refuelling
points

National policy
framework for the
development of
the market as
regards
alternative
fuels in the
transport sector



Co-financed by the European Union
Connecting Europe Facility

"P²" Presidential Decree for LNG Bunkering in Greece

PMII partners actively contributed to the legislation process by sharing their knowledge & expertise and working closely with the competent Greek authorities

Umbrella for port guidelines

Fire-fighting measurements

Emergency & safety provisions

Manuals for LNG bunkering preparation & execution

Training

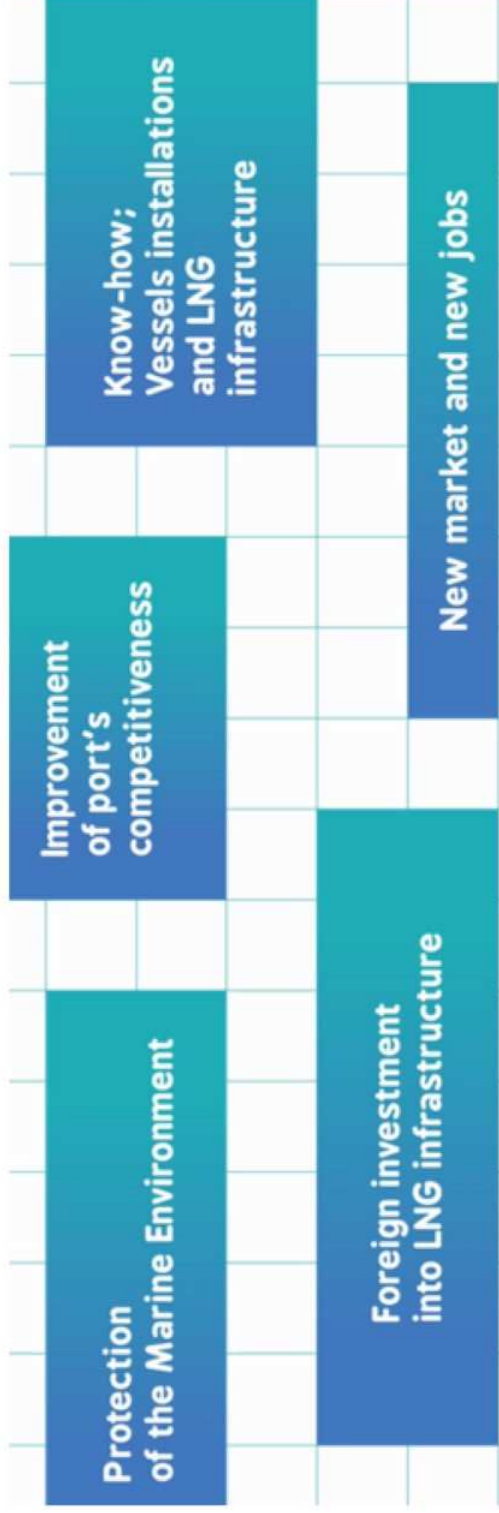
SIMOPS



Co-financed by the European Union
Connecting Europe Facility

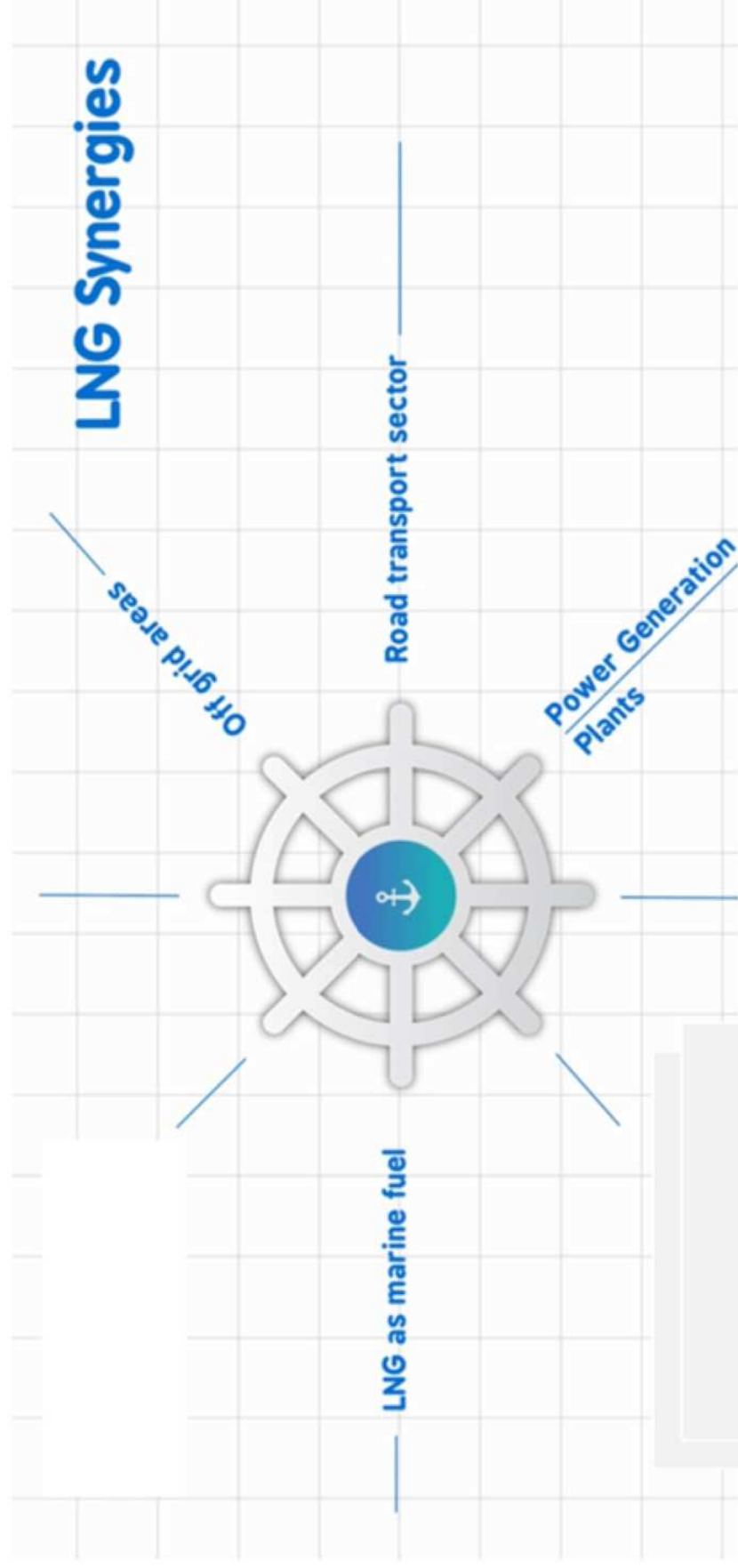


PMII Regional impact: PMII creates new opportunities for investments in every aspect of SSLNG supply chain, both on local and regional level, adds value to the regional ports, creates synergies and new jobs and faces the regional challenges by boosting growth. PMII partners, think regionally, while acting both regionally and locally!

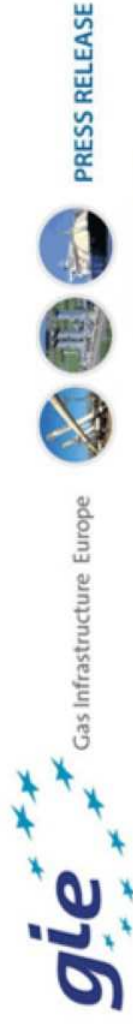




LNG provides an “alternative” way of connectivity to off grid consumers through Small Scale LNG infrastructure



Regional advantage of PMII



Press Release

28 February 2018

GIE releases the Small-Scale LNG database 2018

GIE releases its Small-Scale LNG 2018 database. The database provides the LNG industry and interested parties with an overview of the available, planned and announced small-scale LNG infrastructure and services in Europe. After being awarded this month The Most Supportive Gas Institution of the Year for its transparency tool [ALSI](#) at the Small-Scale LNG Summit 2018 in Milan, GIE continuously contributes to the increase of transparency in the LNG market.

Key findings

Small scale LNG infrastructure is heavily dependent on the proximity of large scale LNG import terminals. As of end 2017, 75% of operational small-scale LNG infrastructures were in countries that have large scale regasification terminals¹, mainly in Western Europe.

Downloads

- Press Release (PDF, 119KB)
- GIE SSLNG database 2018 (XLSX, 115KB)

For inquiries, please contact the GIE Secretariat :



Gas Infrastructure Europe (GIE)
Avenue de Cortenberg 100
1000 Brussels

Source: <http://createsend.com/t/r733801CF073A022B2540EF23F30FEDED>

According to GIE, Small Scale LNG Infrastructure is heavily dependent on the proximity of Large Scale LNG import terminals, such as Revithoussa LNG terminal, which are the key logistical springboard for small scale LNG

sailing on the LNG era



Thank you

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