



POSEIDON
MED II
LNG
BUNKERING
PROJECT

Poseidon Med II

George Polychroniou
Poseidon Med II - Project Manager

Executive Director
Strategy, Business Development, Administration & IT
DEPA – Public Gas Corporation S.A.

“Poseidon Med II calls at Piraeus”

Piraeus Municipal Theatre, Piraeus
December 8, 2016



Co-financed by the European Union
Connecting Europe Facility



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II. Small Scale LNG in Greece

III. Poseidon Med II





I. LNG as Marine Fuel

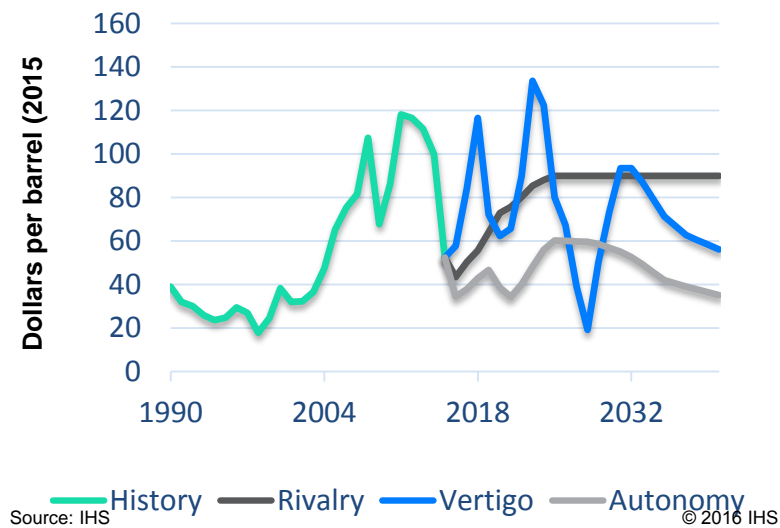
II. Small Scale LNG in Greece

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LNG in the international energy market

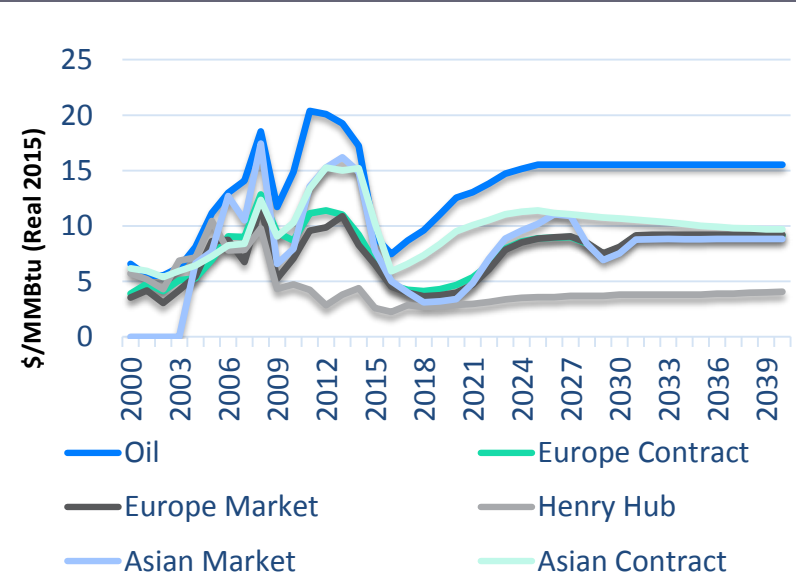
Average annual crude oil prices (real), 1990–2040



LNG globally commoditized

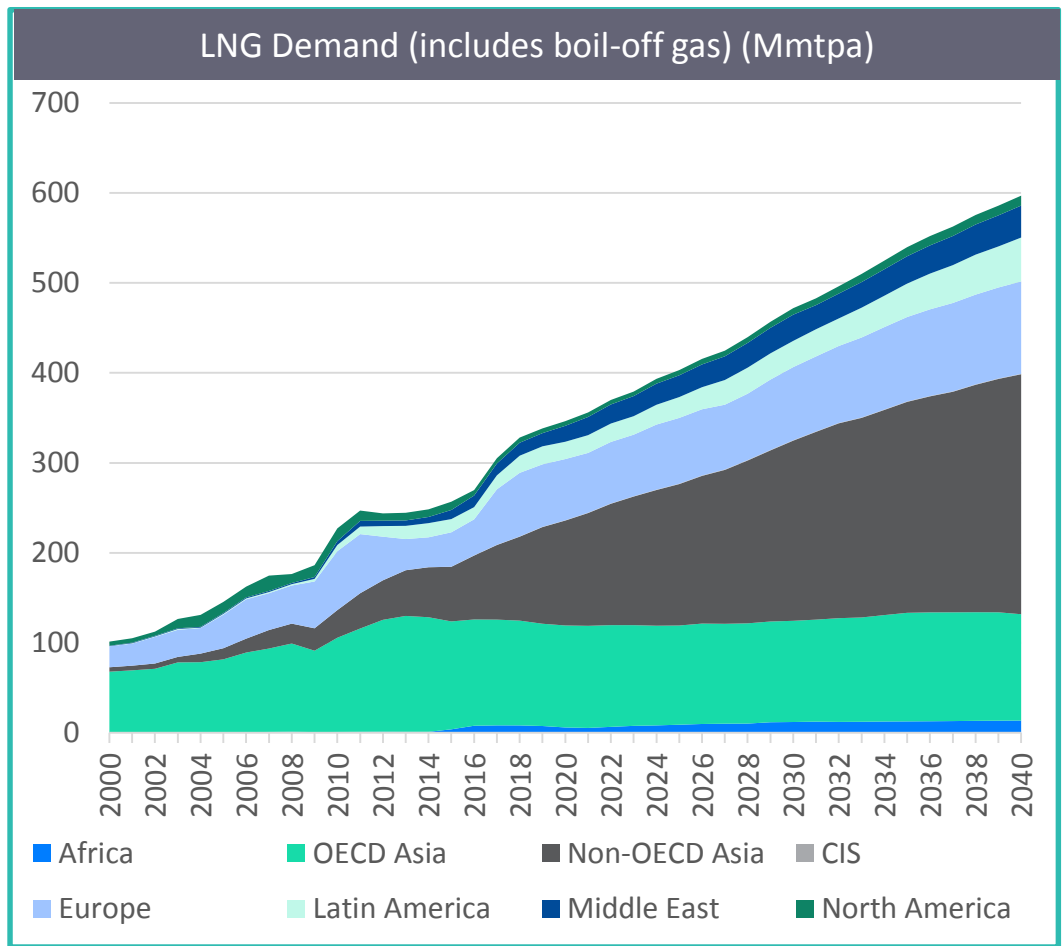
Increased decoupling of oil and gas prices

Comparative gas prices (Real), 2000-2040





Global LNG Demand



LNG Demand growth under all scenarios

Non-OECD Asia is the main growth market

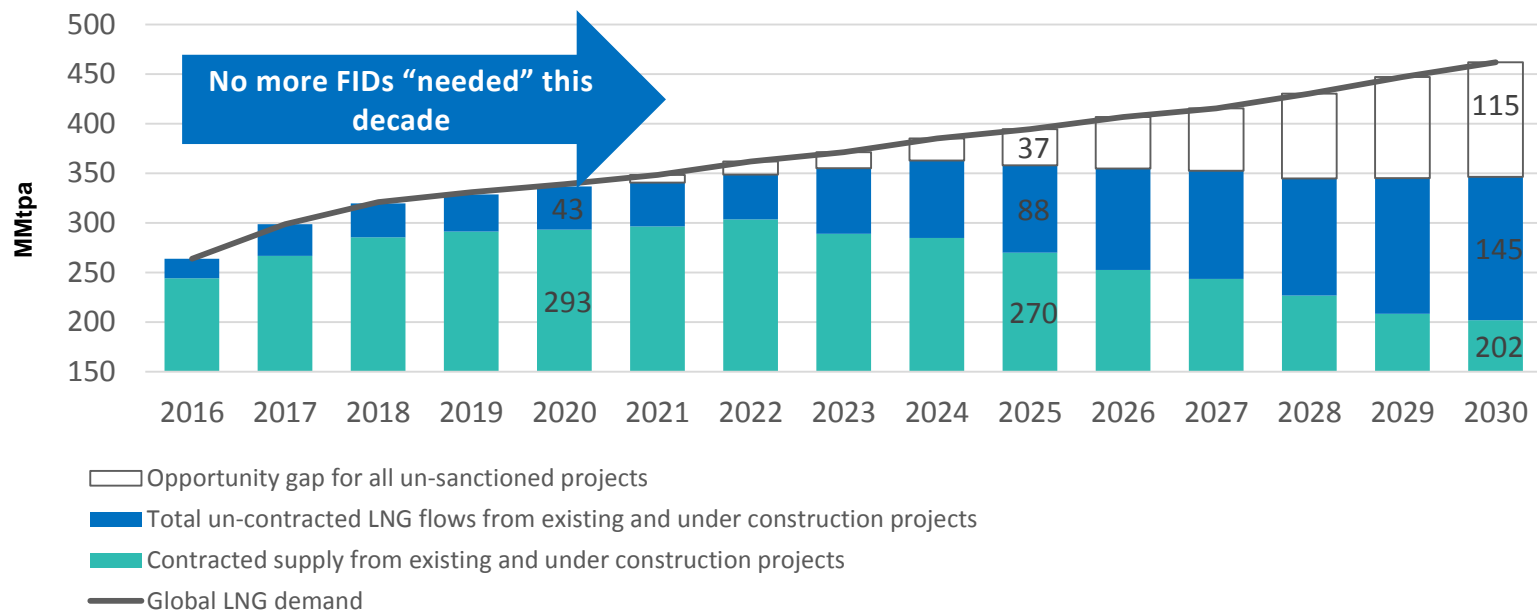
Europe remains the residual market

LNG demand as transportation fuel grows in importance



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

Buyers market

Reduced capacity utilization 80%-90% vs. 88% (in the period of 2000-2016)





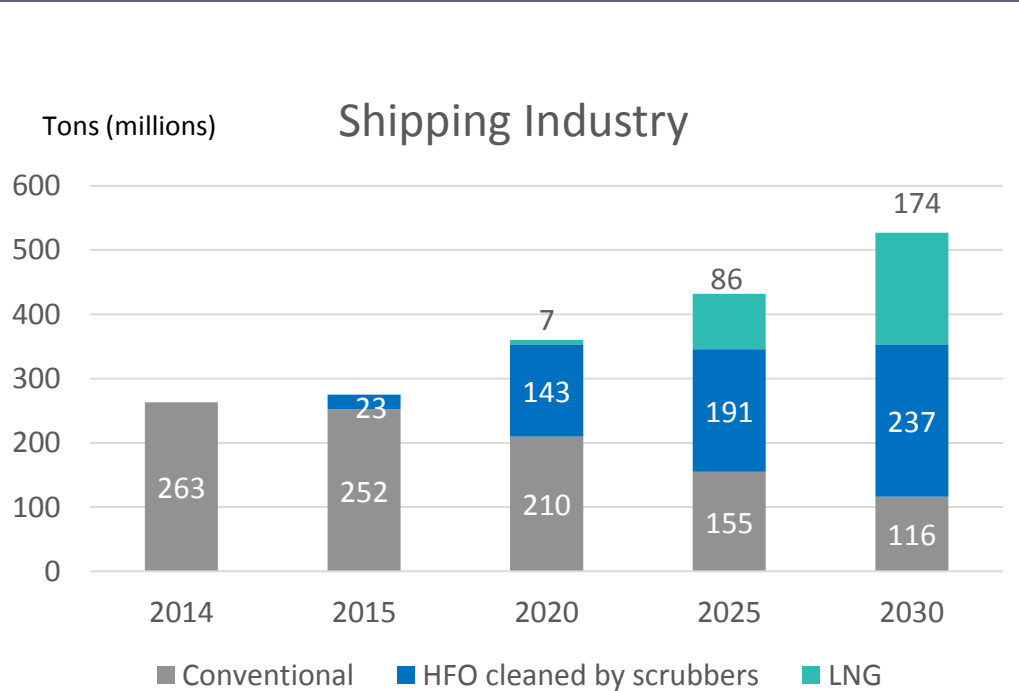
LNG as marine fuel

- Recent decision of IMO/MEPC will speed up developments
- LNG competition with Low Sulphur Bunker Fuels and EGCS (scrubbers) but:
 - Competition depends on oil price level and LNG decoupling
 - LNG can offer compliance with potential future environmental regulation (NO_x, PM, CO_x)
 - Conversion Investments payback often < 5 years
 - LNG could be the most beneficial option for:
 - Smaller vessels
 - New builds
 - Vessels operating on fixed routes (e.g. Container vessels, Ferries, Cruise ships)
- Other issues also matter (safety, reliability)



LNG Demand for Bunkering

LNG Consumption as a bunker fuel



Source: BCG analysis

Different views often diverging.
Drivers that could speed up the demand:

1

New environmental regulations

2

Availability and cost of ownership for other bunker fuels

3

Optimization of the SSLNG supply chain



I. LNG as Marine Fuel

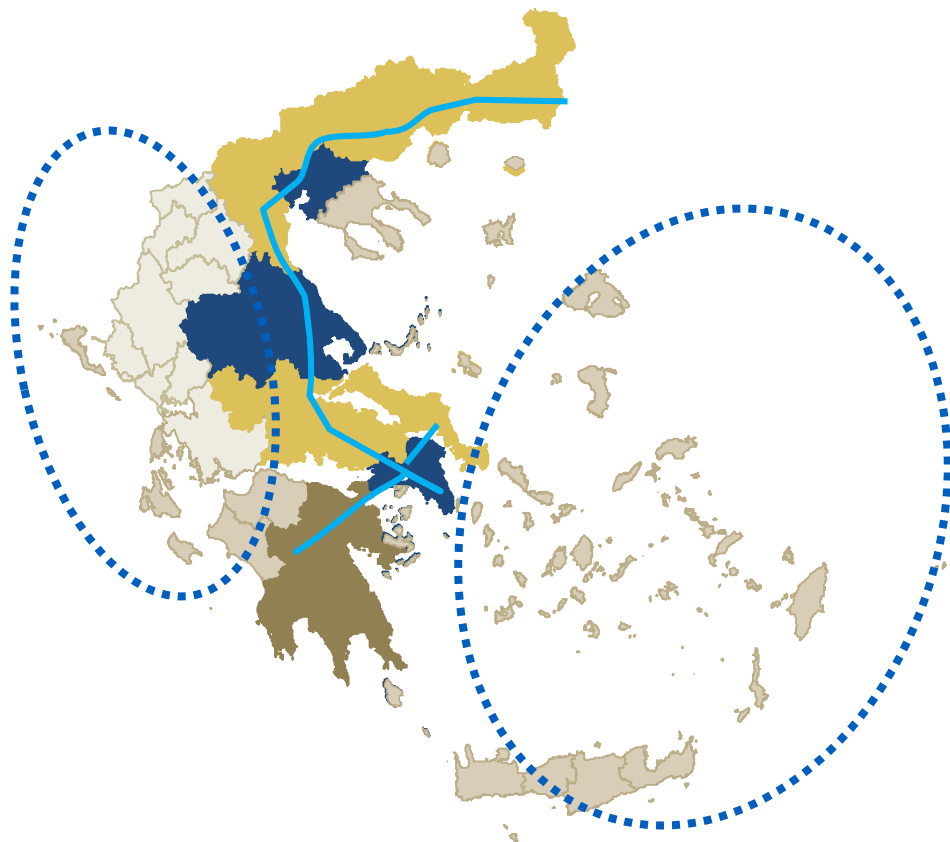
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Small Scale LNG in Greece



New Markets for transport
(bunkering, road transport)

High density residential areas & large
industrial & commercial customers in
Western Greece and the islands

Non interconnected power
generation plants

Existing Network

Network under
Development

New Regions

— Main HP System



Small Scale LNG is possible and suitable in the area

Tradition - Greece is a world leader in shipping

Strategic geographical position

Important internal short sea activity (53 Islands with population >1.000 - 111 ports)

Need for LNG for other uses (potential for gasification of remote areas)

Availability of LNG supply / infrastructure (LNG Terminal – Revithoussa)





I. LNG as Marine Fuel

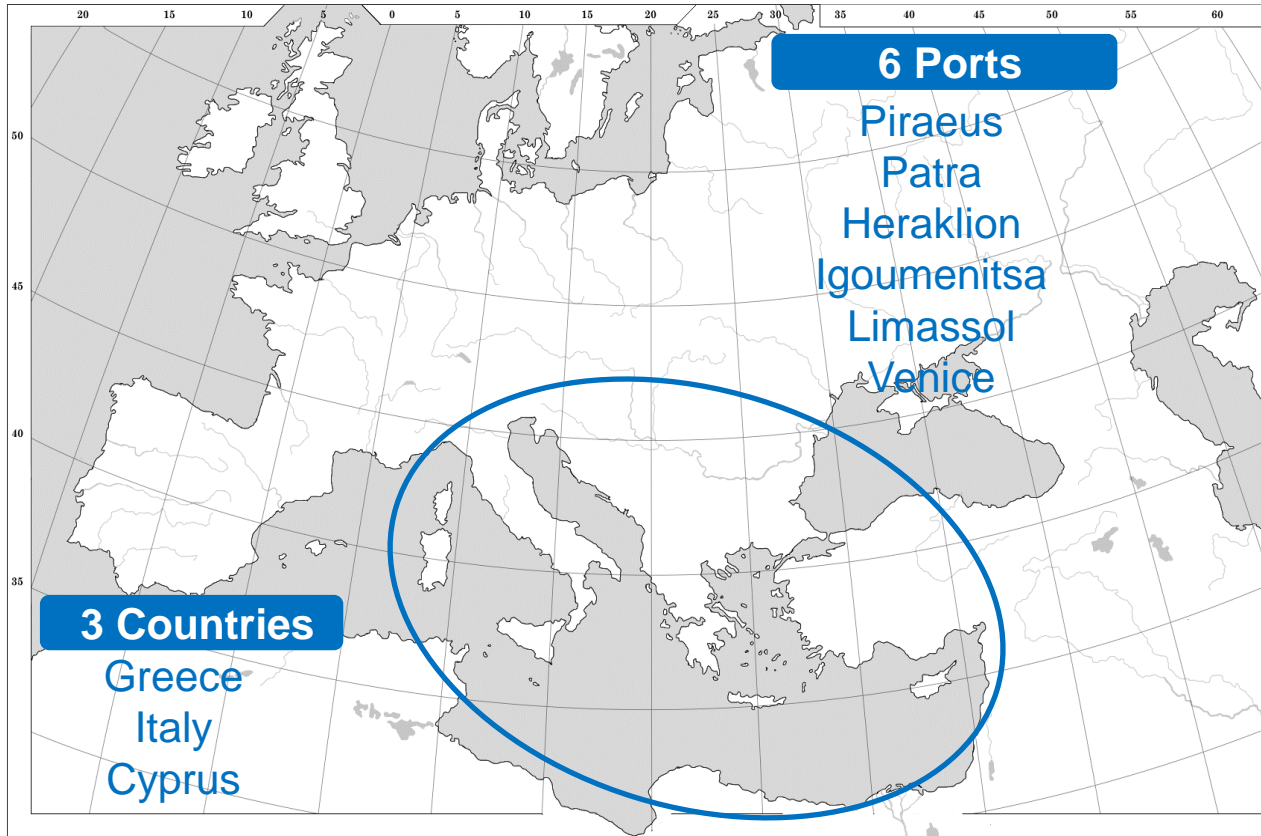
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LNG at Ports



Duration: Jun.2015 – Dec.2020

Budget: ~€53M

Coordinator: DEPA

Technical Coordinator: DESFA

Partners: 26

Co-financed: 50% by EU - CEF
Connecting Europe Facility



Activities

Project Organization	Coordination – Management – Dissemination Social & Public Consultation – Awareness
Ports & LNG Terminal Infrastructure	Environmental/Safety/Site Studies – Ports Master Plans updating Supporting/Preliminary/Detailed Design Studies – Tender documents
Vessels Infrastructure	Technical studies for selected vessels
Pilot case (Venice)	Executive Design and Construction of an Innovative LNG Vessel
Financial aspects	Installations Financial Assessment Financial Instruments for the Global Projects Investments
Regulatory framework	Adaptation of the Regulatory Framework
Sustainability-Synergies	Assessment of Efficient Supply Chain/Synergies Sustainable LNG Pricing Patterns





Partners





Progress in 2016



HAZID Workshops

Stakeholders Dissemination Events

Assessment and consultation process with selected shipyards

Special working groups for the formulation of Regulatory Framework

Selection of 10 candidate vessels for retrofitting



Progress in 2016

Preliminary layout
of the truck loading station



Specifications for the design of the
LNG Feeder



Market research for other NG uses



Meetings with stakeholders to
explore synergies



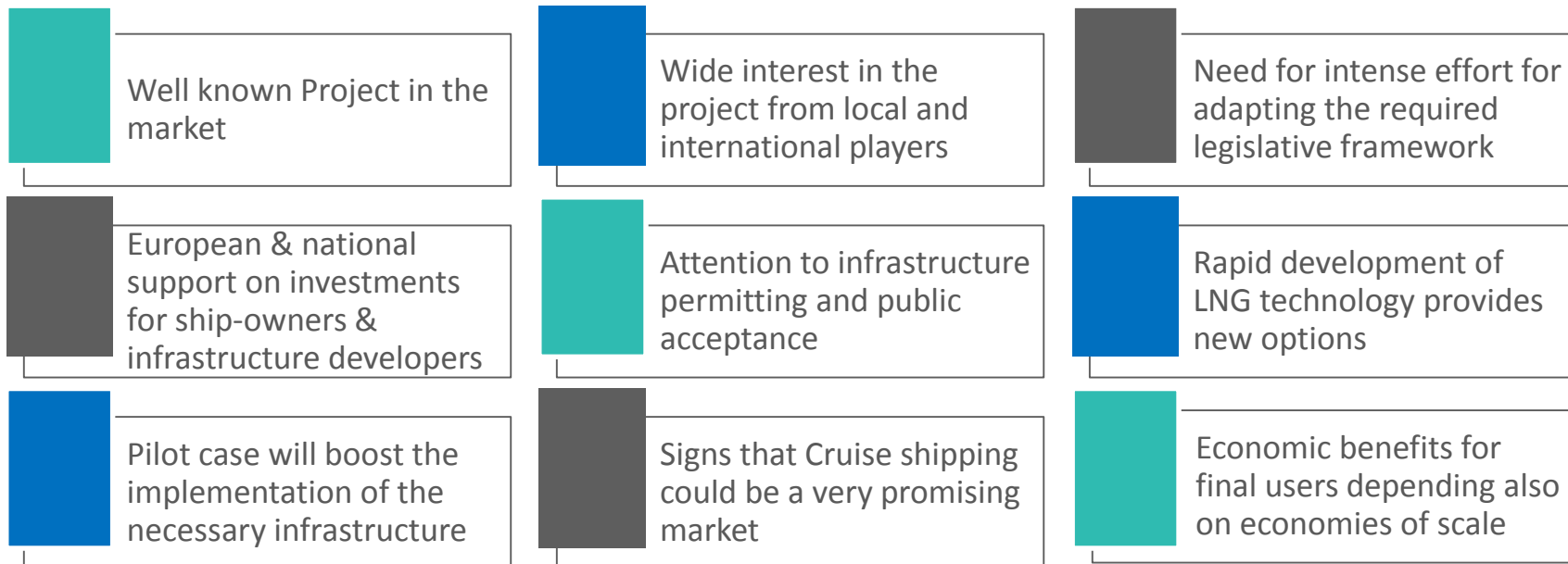


Plans for 2017

- Preliminary EIA for all ports and Revithoussa
- Supporting (Baseline) Engineering studies
- LNG As Fuel on new building Designs
- Bunkering Vessel Designs
- Design of a Pilot Truck loading station on the island of Revithoussa LNG import terminal
- Technical recommendations detailing quantity and quality measurements across the LNG bunkering supply and custody transfer chain



Poseidon Med II – Key considerations



Conclusions

- LNG: a fast growing fuel in a globally commoditized market, gradually delinked from oil
- A buyers market in the short-medium term
- LNG for bunkering: The best choice especially for long term viewers
- Chicken – Egg problem creates uncertainty in the short term;



Synergies are a possible way out &

Poseidon Med II could be a catalyst for market development



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sailing on the LNG era



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