



SMALL-SCALE LNG IN THE MEDITERRANEAN

Energy Security in SE Europe and the role of LNG

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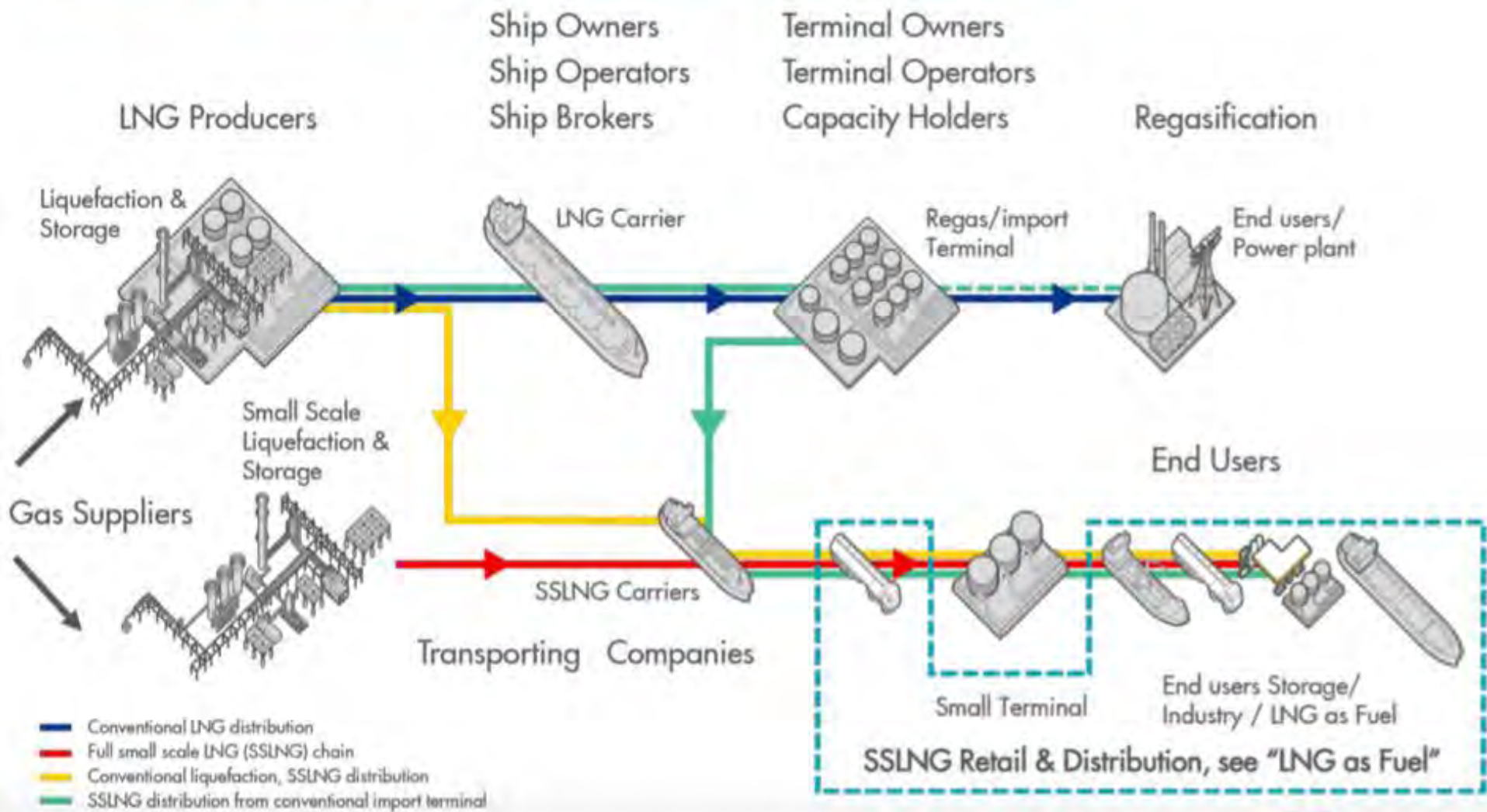
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SMALL SCALE TO LARGE MARKET

Strategies & Technologies towards the Mediterranean Area

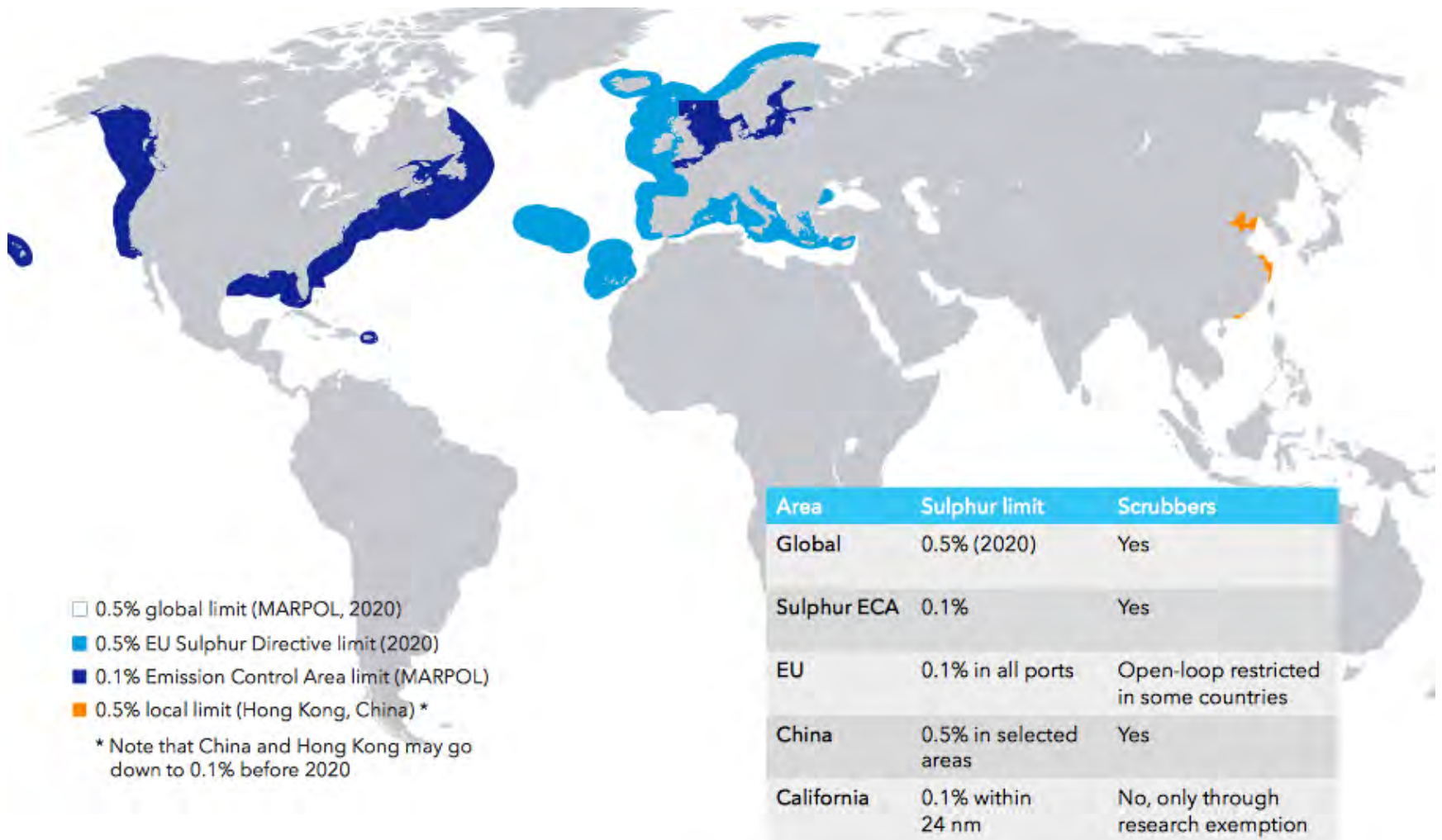
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Configurations of the Small Scale LNG value chain



Source: International Gas Union

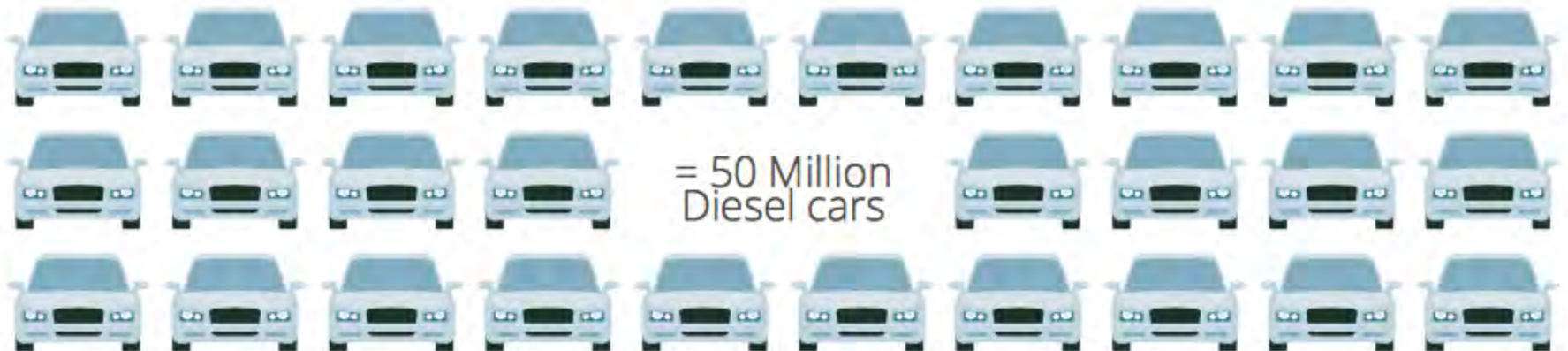
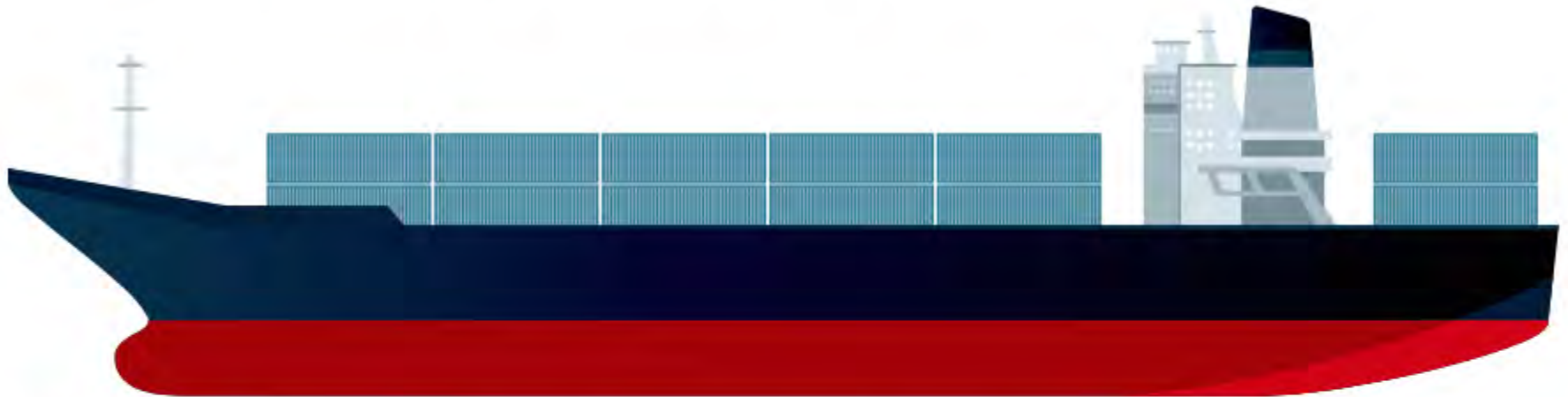
LNG bunkering: SOx Regulations creating new impetus for the industry



Source: DNV GL

LNG bunkering: SOx Regulations creating new impetus for the industry

“One large container ship at sea (using 3% bunker fuel) emits the same amount of sulphur oxide gases as 50 million diesel-burning cars.”



The 3-level regulatory framework:

LAWS ON EMISSION OF AIR POLLUTANTS FROM SHIPS

- **UN level***: Annex VI of the IMO MARPOL CONVENTION 73/7832 at the international (UN) level;

*2020 IMO global 0,5% fuel sulphur cap

- **EU level**: The EU Sulphur Directive (2012/33/EC33)

- **National level**: EU Member States are competent to set out the rules at national level, *including state support schemes*

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

	Coverage	Timings
<i>Electricity in urban/suburban and other densely populated areas</i>	<i>Appropriate number of publically accessible points</i>	<i>by end 2020</i>
<i>CNG in urban/suburban and other densely populated areas</i>	<i>Appropriate number of points</i>	<i>by end 2020</i>
<i>CNG along the TEN-T core network</i>	<i>Appropriate number of points</i>	<i>by end 2025</i>
<i>Electricity at shore-side</i>	<i>Ports of the TEN-T core network and other ports</i>	<i>by end 2025</i>
<i>Hydrogen in the Member States who choose to develop it</i>	<i>Appropriate number of points</i>	<i>by end 2025</i>
LNG at maritime ports	Ports of the TEN-T core network	by end 2025
LNG at inland ports	Ports of the TEN-T core network	by end 2030
<i>Shore-side electricity</i>	<i>Ports of the TEN-T core network and other ports</i>	<i>by end 2025</i>

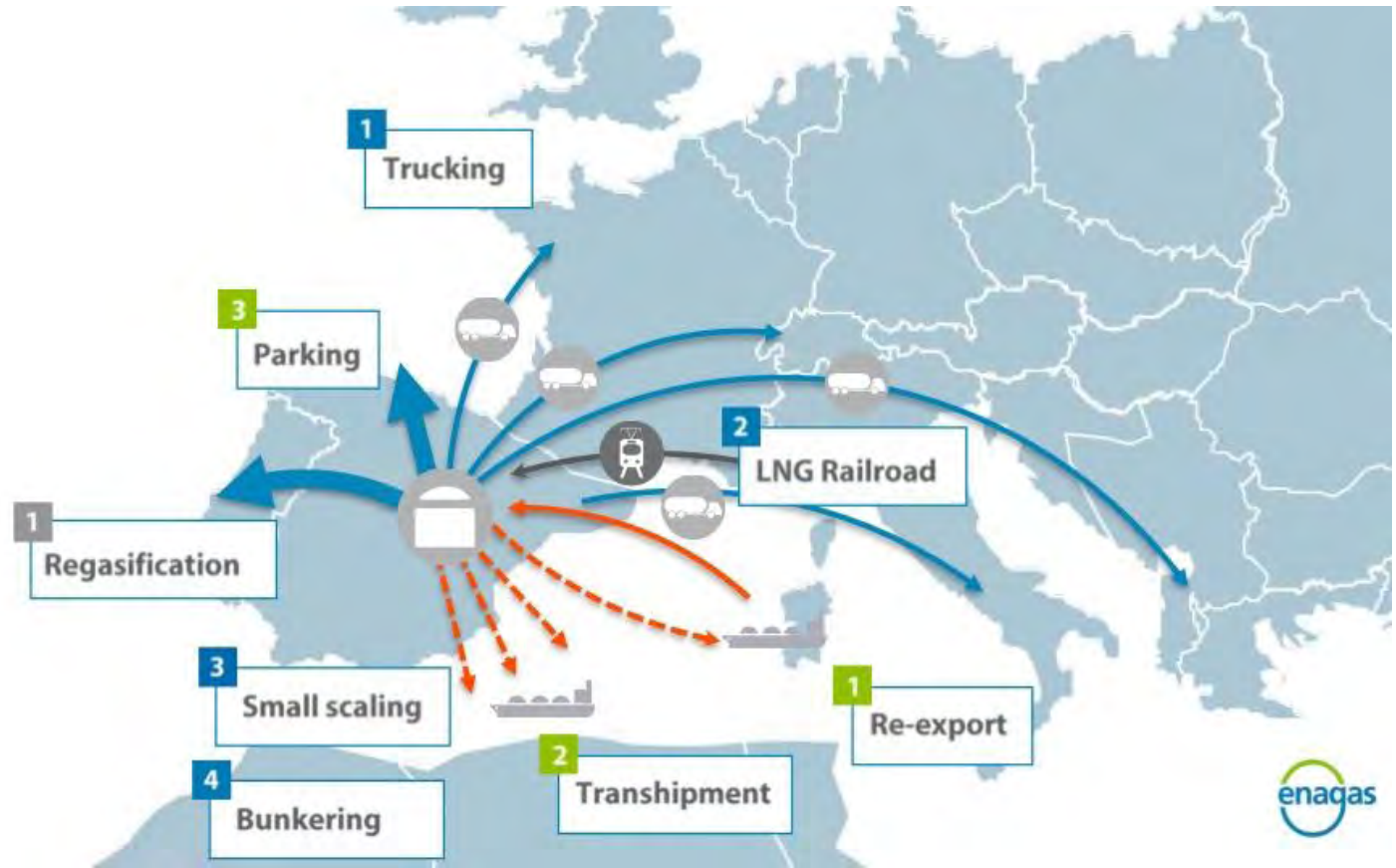
Case Study: ENAGAS ssLNG hubs

Integrating new logistic services into the classical LNG value chain

■ Traditional services

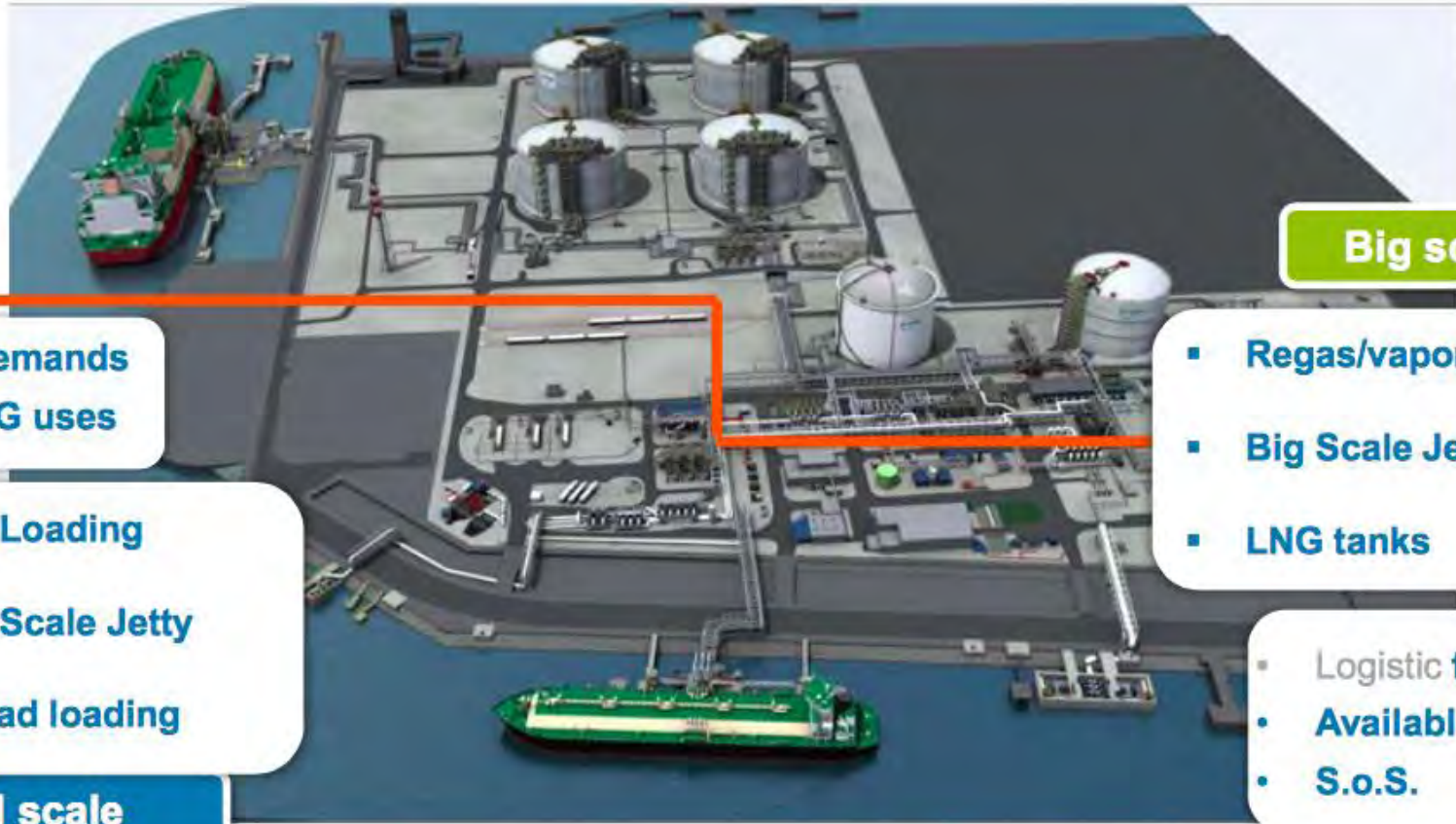
■ Small scale

■ Large scale



Multimodal LNG terminal

Barcelona: symbiosis of big and small-scale LNG infrastructure



Big scale

- Regas/vaporizers
- Big Scale Jetty
- LNG tanks

- Logistic flexibility
- Available capacity
- S.o.S.

- New demands
- New NG uses

- Truck Loading
- Small Scale Jetty
- Railroad loading

Small scale

Italy: Edison to expand its presence on ssLNG market

*Indicative map only - not to scale



1. What does it take to develop a regional Small-scale LNG in the Mediterranean?

2. What could be the role of Greece?

Challenges

- **Market (oil and LNG price)**
 - Pricing dynamics LNG, MGO, HSFO
 - How LNG will be indexed in the bunker market?
 - Lack of pricing transparency
- **Regulations: national – regional – global levels**
- **Capital intense infrastructure (chicken and egg problem)**
- **Training standards**
- **Robust methodology on the relevant technological solutions**

LNG Bunkering in EU's Med:

Key Prerequisites for success

Stable and coherent
regulatory frameworks

Robust
infrastructure network
(overcoming the chicken and egg dilemma)

Right, safe and efficient operation;
Common **training standards**

Stakeholder **engagement and awareness raising**

Synergies with small-scale and shore & deep sea are crucial

Robust methodology on relevant **technological solutions**


Regional level: collaboration between ship-owners, designers and class societies

EU level: collaboration between of national governments, regulatory authorities and EU institutions on the issue


International Level: Collaboration with international Partners, i.e. North Africa

Addressing these challenges through cross-border cooperation




 Co-financed by the European Union
Trans-European Transport Network (TEN-T)



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Benchmark Projects on LNG Bunkering in the East Med and the Adriatic



**POSEIDON
MED
LNG
BUNKERING
PROJECT**



Co-financed by the European Union
Trans-European Transport Network (TEN-T)

introduce LNG as the main fuel for the shipping industry and develop a infrastructure network of bunkering value chain in Cyprus, Greece, Italy, Croatia and Slovenia



Archipelago LNG



Co-financed by the European Union
Trans-European Transport Network (TEN-T)

technical & economic framework of the small scale LNG as marine fuel value chain in the South Aegean Region



**POSEIDON
MED II
LNG
BUNKERING
PROJECT**



Co-financed by the European Union
Trans-European Transport Network (TEN-T)



all the necessary steps towards adoption of LNG as marine fuel in East Mediterranean Sea

making Greece an international marine bunkering and distribution hub for LNG in South Eastern Europe

The role of Greece and Piraeus as an LNG bunkering hub in the region



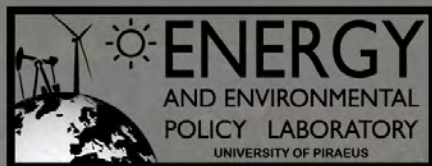
Source: DEPA, PMED II Launch, 2016

ssLNG: supporting switch from oil products and coal; complementing RES

- ssLNG to serve **high density residential areas, large industrial and commercial customers** in Western Greece
- Covering the energy needs of **non interconnected power generation plants**
- ssLNG and RES: **opportunities for symbiotic growth and reaching economies of scale across the islands**

Energy Union Future Leaders Academy

under the Auspices of EC's Vice President for the Energy Union,
Maroš Šefčovič



Under the Auspices:



Energy Union Future Leaders

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Thank you for your kind attention!

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