



Energising Shipping Beyond 2020, The Eastern Mediterranean and the case of Greece

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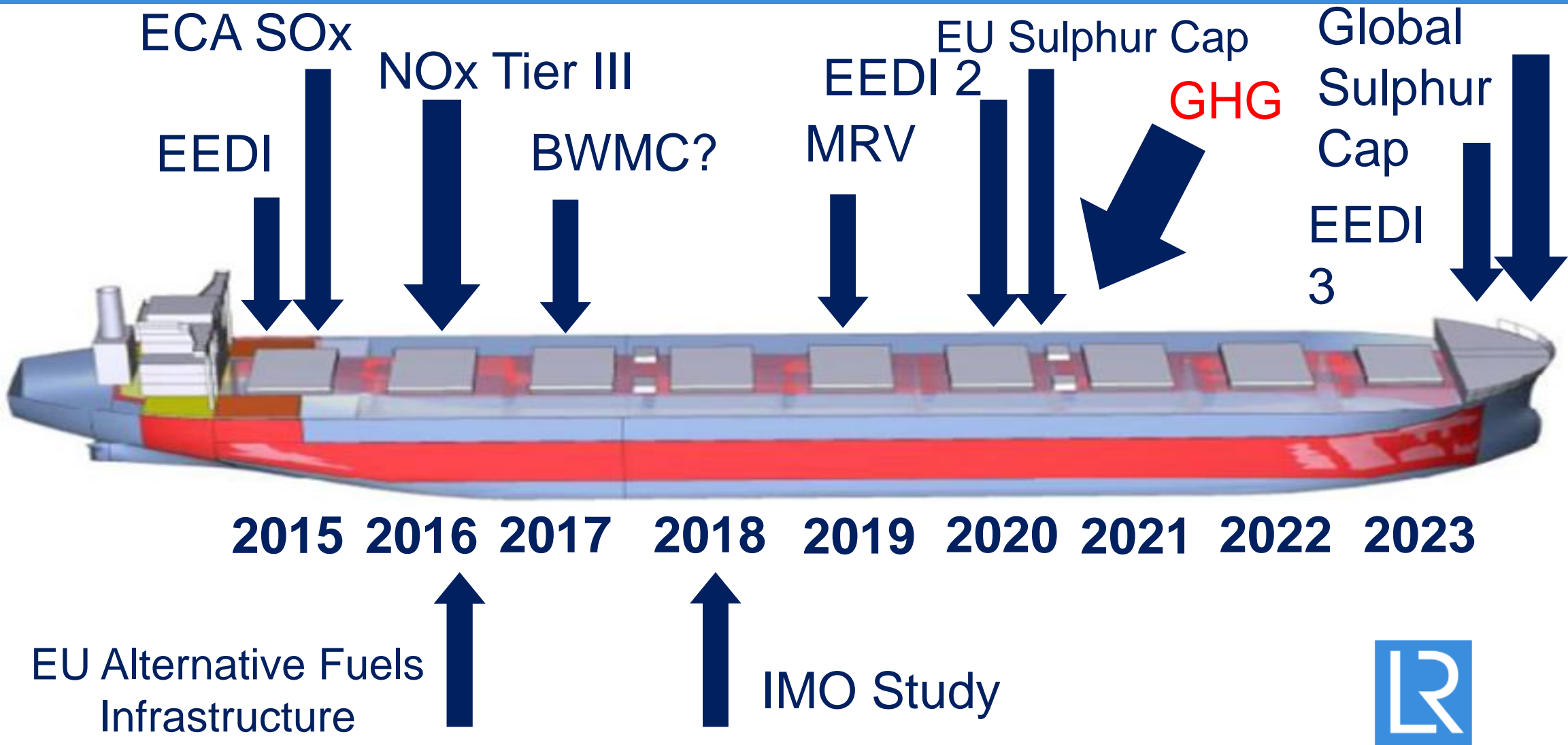
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Working together
for a safer world

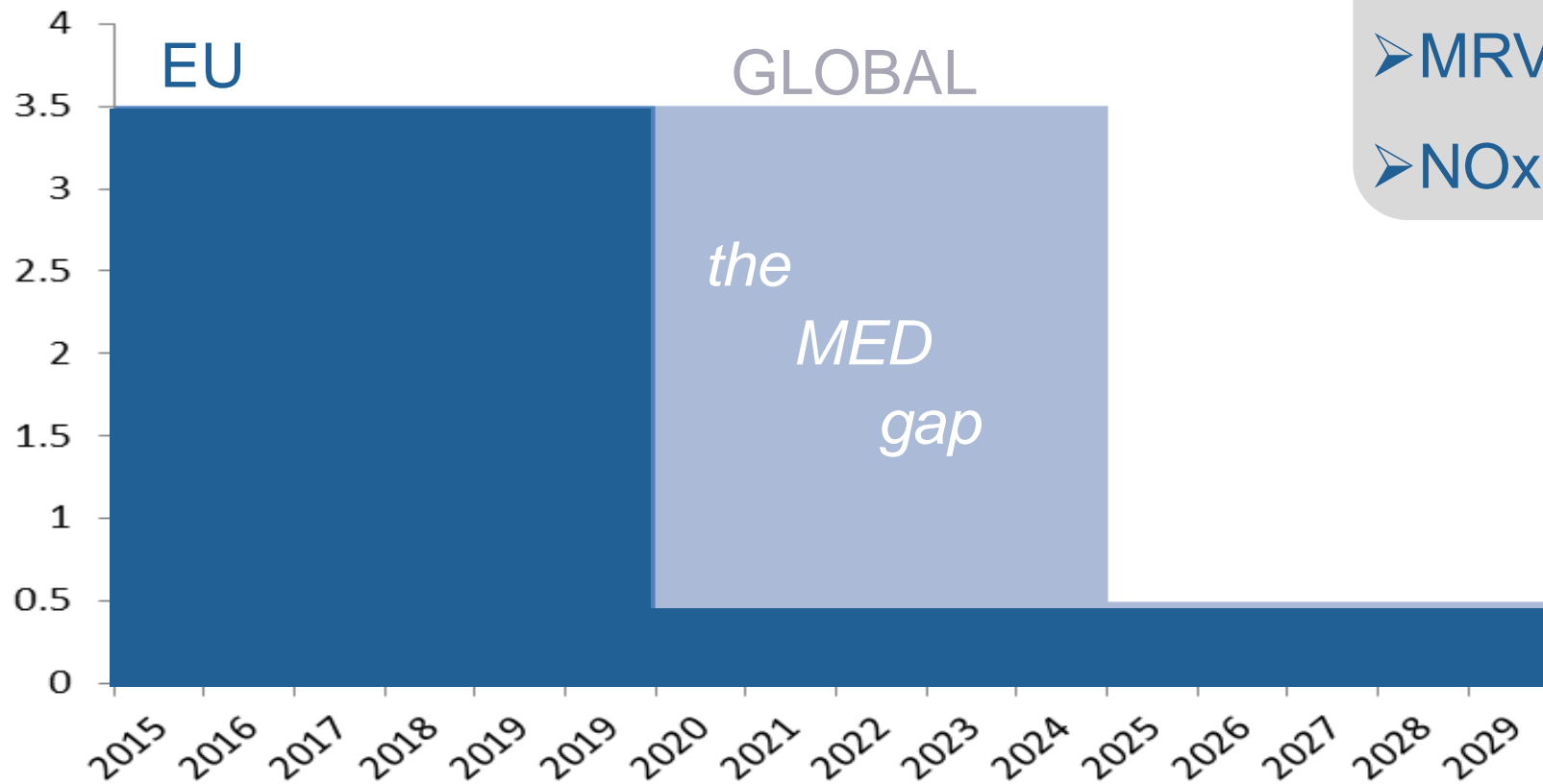
Regulatory Challenges Ahead



European Union – Legislative Activity



Sulphur in %



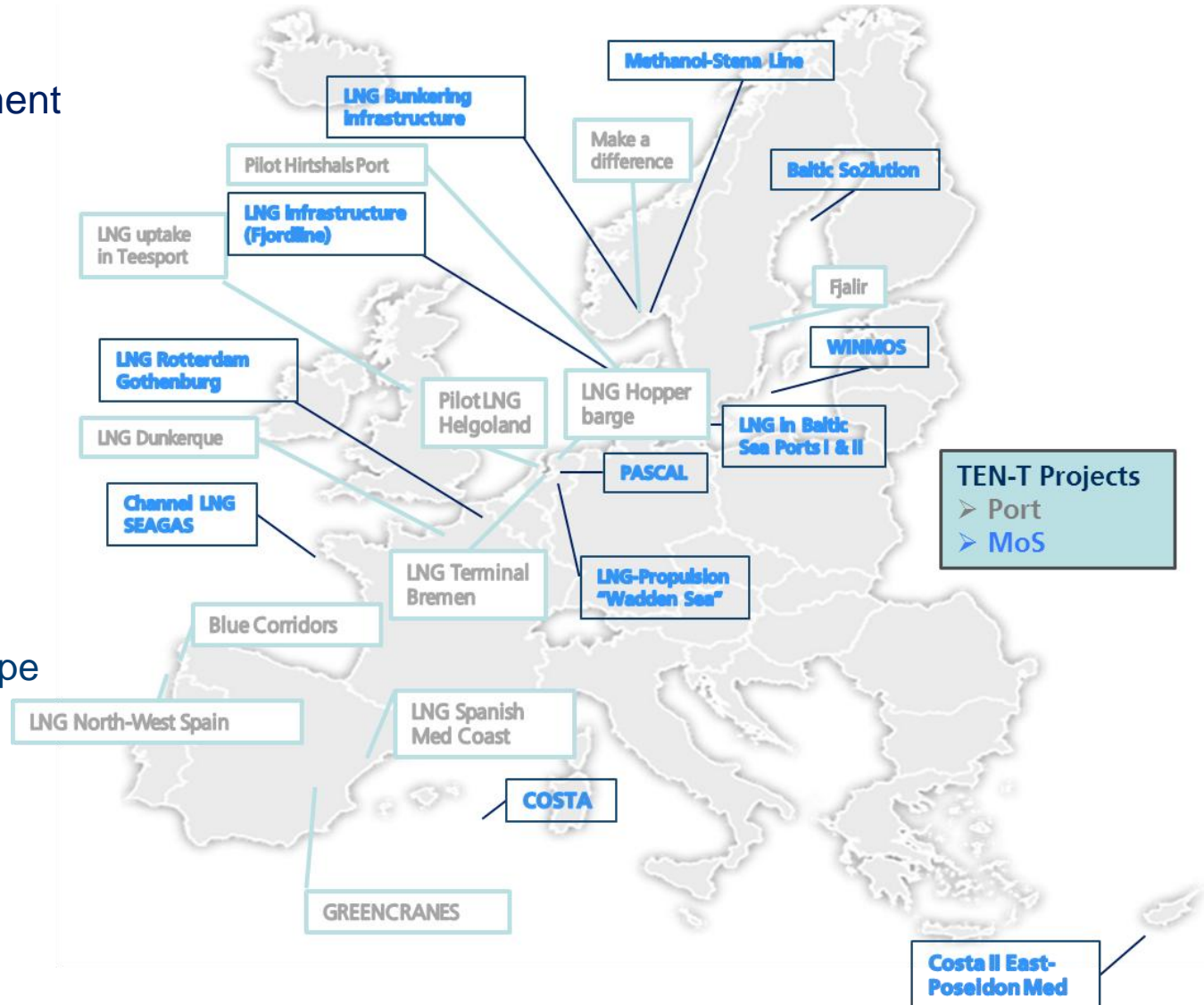
- Sulphur Directive
- MRV and... MBMs
- NOx ?



The European Union case



- ❖ EU owned fleet 48% of Global fleet
- ❖ More than 40% of global marine equipment manufacturers
- ❖ Transportation 94% Dependant on oil
- ❖ Bill = 1 billion Euro/day
- Sulphur Directives
- Alternative Fuels Directive
- Energy security
- Reduction of GHG emissions
- Competitiveness of Transportation sector
- Interconnection with remote areas in Europe
- Macro regional Strategies (Adriatic-Ionian)

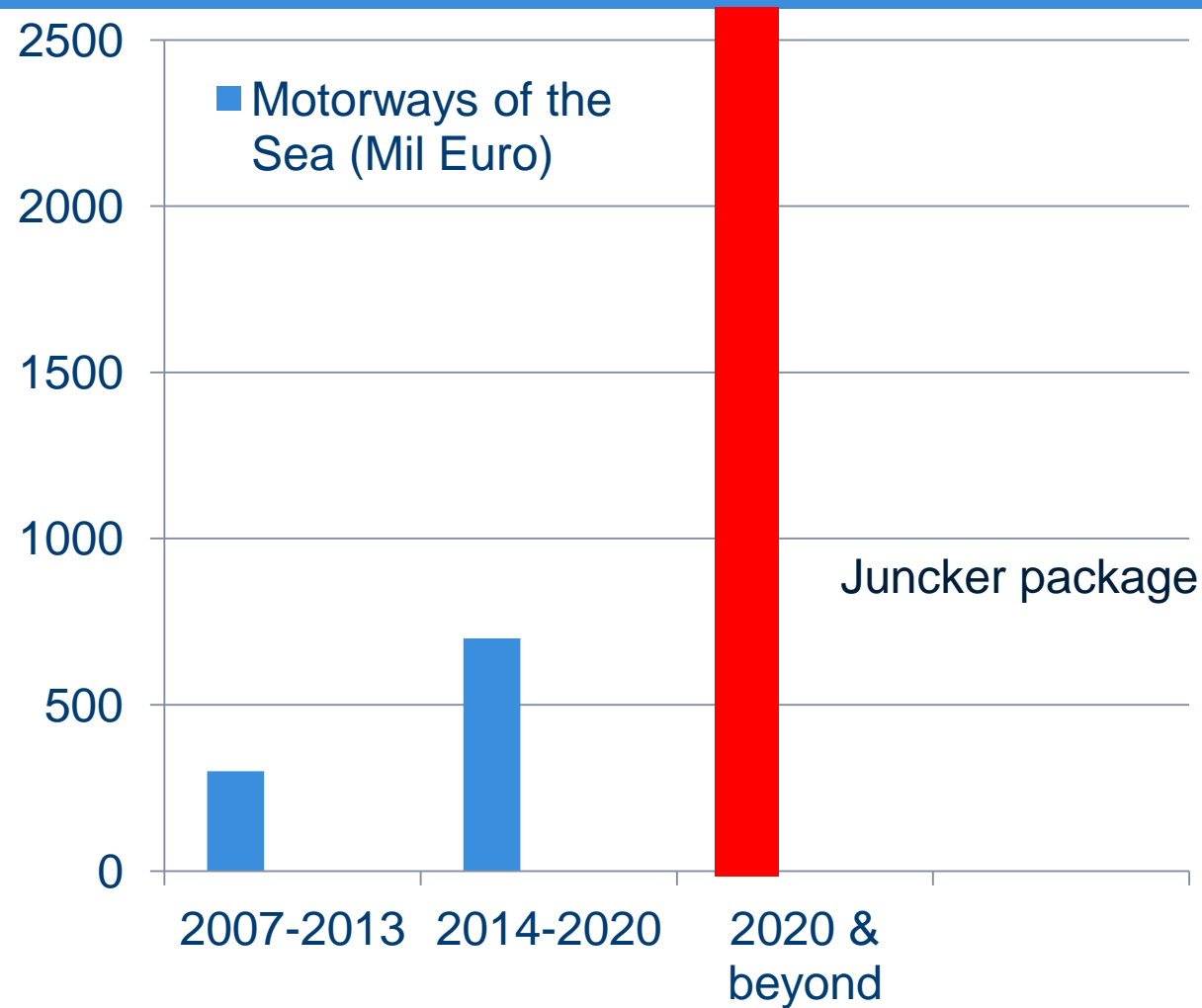




- *The costs of the new requirements to reduce sulphur dioxide emissions could result in modal shift from sea to land-based transport and could have negative effects on the competitiveness of the industries. The Commission should make full use of instruments such as Marco Polo and the trans-European transport network to provide targeted assistance so as to minimise the risk of modal shift.*
- *...Member States may provide State aid in favour of operators affected by this Directive, including aid for retrofitting operations of existing vessels...*
- *Access to emission abatement methods should be facilitated. Those methods can provide emission reductions at least equivalent to, or even greater than, those achievable using low sulphur fuel, ...*



'Connecting Europe Facility – Motorways of the Sea'

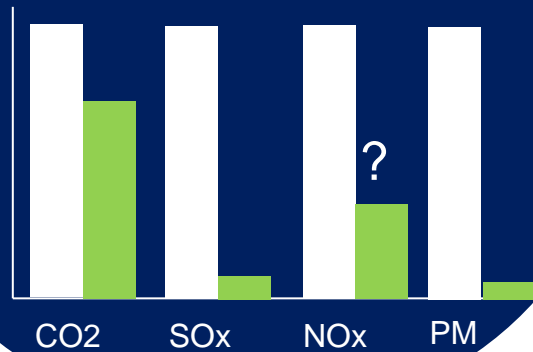


Innovation - Driver for Growth, Driver for Cohesion



LNG as Fuel why?

Environmental



Economic

- US Shale Gas
- Australia's new Supply
- Russia China Pipeline
- Nuclear Japan

Strategic

- Diversification
- Similar Reserve to Production Ratio
- Political Risk hedging



Poseidon Med anatomy

- POSEIDON MED has been the first Cross European Border project which aimed to **introduce LNG as the main fuel** for the shipping industry and develop a **sufficient infrastructure network of bunkering value chain**.
- It focuses in the Eastern Mediterranean Region with five Member States (Cyprus, Greece, Italy, Croatia and Slovenia) involved.
- It is a partnership between gas suppliers , shipping companies, Port Authorities, Technical organisations etc.
- It is officially included in ‘**Juncker package**’ Candidate projects.

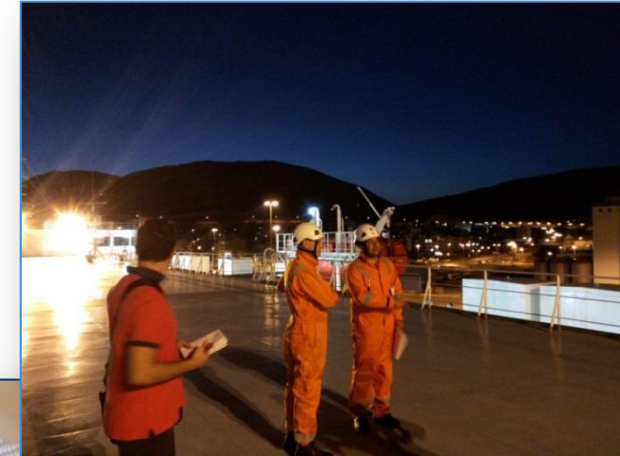


Phase I & II amount to 60 million Euro of budgeted works and studies for the introduction of ‘Gas as Fuel’

Project Activities

□ Regulatory Framework

- Database of Global Regs, Papers, Guidelines - more than 200 by ~ 70 Bodies
- Link with Gaps, Issues, Barriers and latest updates/discussions from main Bodies (IMO, ISO, ESSF, SGMF, STCW, USCG, IACS etc.) – 22 initial ones by EMSA, 22 infrastructure port reports reviewed
- Link with issues identified during workshops (vessels and ports – interconnections - detail) – Proposals to regulators
- National Authorities – Synergies – Greek Legislation review – Engagement



Vessels and Port Installations

❑ Almost 10 technical workshops

- Completion of two pilot vessels at GR (A) Notation Level
- Concept Development and completion of the 69 point questionnaire of the ARBD process for 6 vessels
- HAZIDs for Piraeus and Limassol
- Safety Exclusion Zone , Crete Dock - Piraeus port
- Extensive, dissemination , Promotion Networking Activity

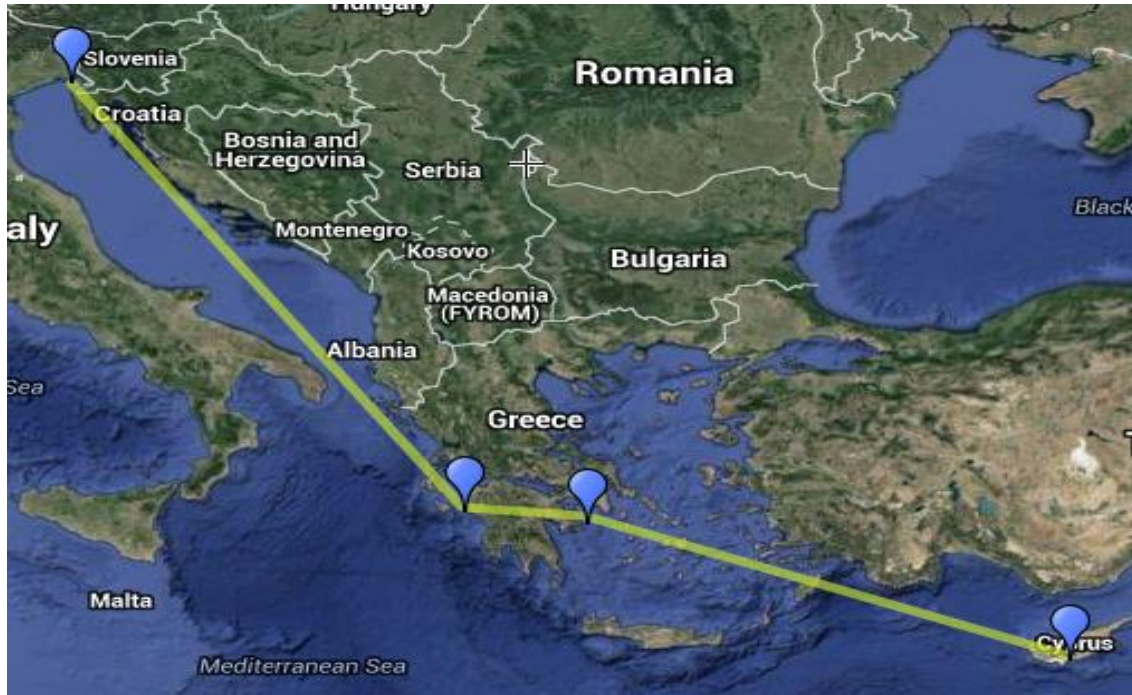


□ In the current phase more detailed scope is envisaged:

- Building of a pilot vessel LNG fuelled vessel for Venice Port (1st in the Mediterranean) plus LNG bunkering Vessels
- 10+ vessels approval in principal and detailed review including both new buildings and retrofits
- Continuation and follow up of the regulatory framework from Poseidon Med regulatory framework gap analysis results
- Studies and risk assessment in 5 ports
- Shipyard preparedness



ELEMED – Electrification Application to the South-eastern Mediterranean Corridor



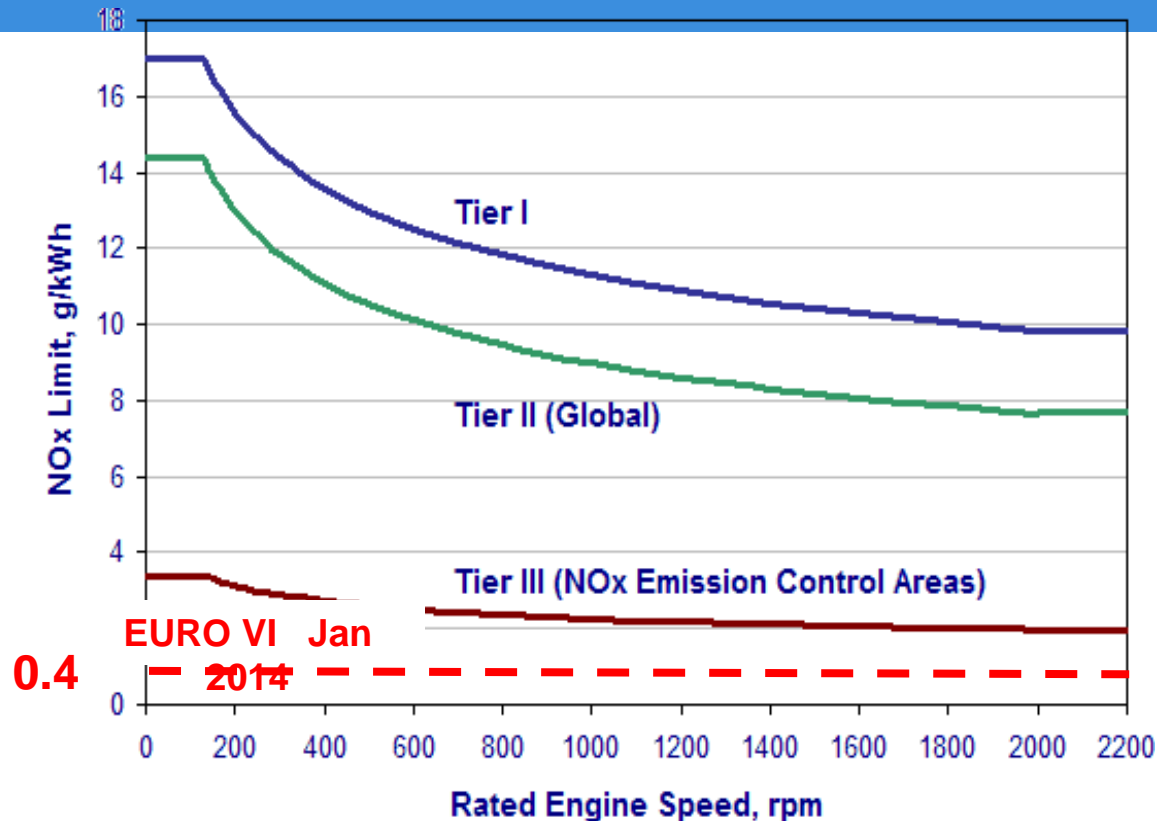
3 Member States – Participating Ports:

- Piraeus – Killini (Greece)
- Limassol (Cyprus)
- Koper (Slovenia)

Cross-European maritime network and **macro-regional strategies** for Adriatic-Ionian Seas



Societal Cost – The NOx Case



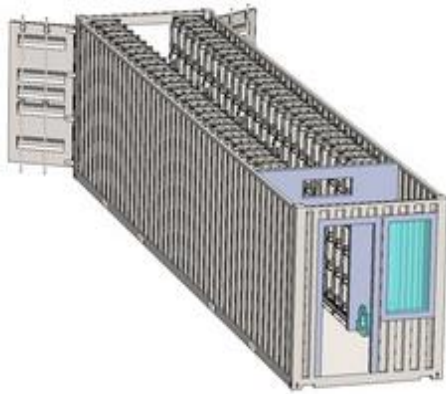
- Nox is the most lethal emission to human beings
- Despite the avalanche of Regulations little is done for our area
- Cruise in port of Piraeus may easily exceed 50 MW in power in standard days

Cold Ironing is the quickest way to solution as it takes combustion away from densely populated areas



ELEMED- Electrification, Wide range of solutions readily available

40' Container Configuration



- Battery Only, 1365 kWh
- Battery & Power Electronics, 819 kWh

- Remote charging
- Containerised ESS
- ESS and Energy Recovery Systems



ELEMED Scope

- Review of Global completed case studies and alternative electric interconnection solutions (Juneau & Los Angeles, Rotterdam, Gothenburg etc.)
- Examination of modern technological achievements (Smartgrid, Lloyd's Register on large batteries Installations etc.)
- Maturity of local studies for implementation



Upon the completion of the project:

- ✓ the new electric bunkering infrastructure requirements for each port will be defined
- ✓ the new era for ships electrification in the SE Mediterranean will arrive
- ✓ SE Med will be ready for the Global Project: development of a worldwide competitive new electric shipping sector



Financial & Operational Benefits

Exploitation of **low-carbon electric energy** generated by **inland power stations**

Promoting commercial implementation & **port competitiveness**

Preparing ports for use of **alternative energy sources**, Ports connection to **Smartgrid**

Preparing ports for accommodation **alternative fuels LNG fuelled & electric/hybrid ships**

Boosting sustainable shipping with emphasis in **short and mid-range mobility**

Introducing **zero emission solutions** & blending **clean fuels** & the **renewable energy** with **shipping**

Revival of the **local ship construction** activity with focus on **extrovert technology**

Boosting **growth** by accelerating technology uptake

Making **island mobility** realistic and sustainable



Societal & Environmental Benefits

Amelioration of **public health** & **environmental protection**

Reduction of **air emissions** in the ports surrounding areas

Reduction of **noise and vibrations** from ships at berth

Upgrading of the **quality of life** with prospective **growth** in other sectors: trade, tourism

Alignment with **EU directive** for **SOx** emissions (2020) and potential upcoming directives for **NOx** emissions

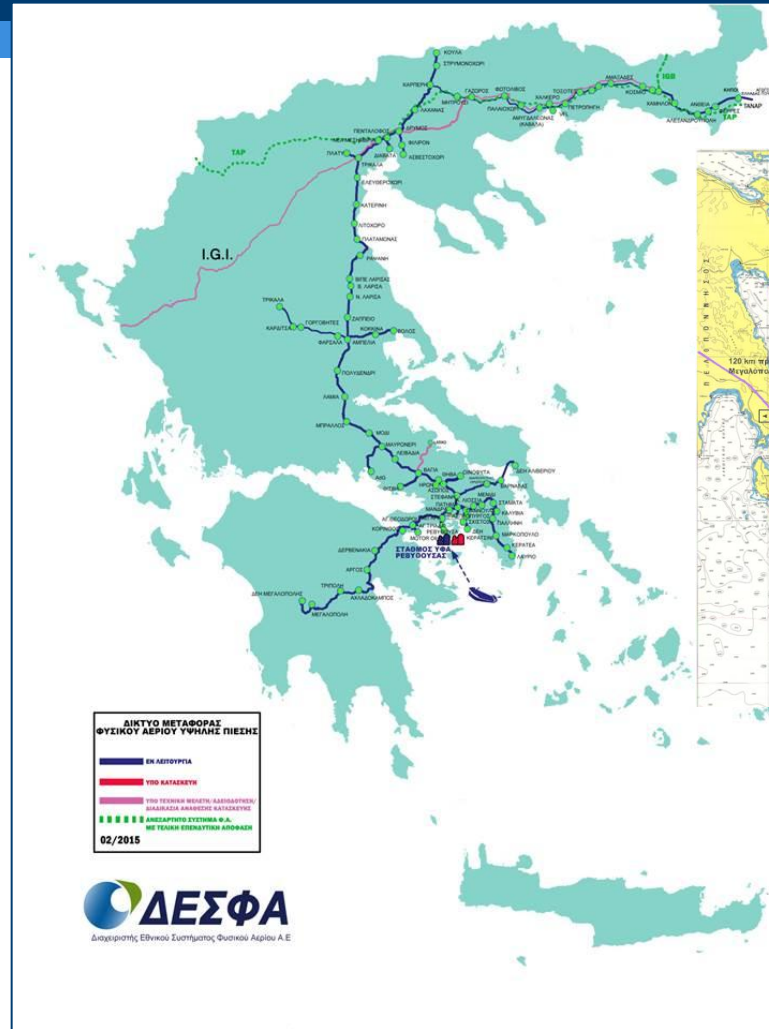
Alignment with International goals for air emissions (**Paris Agreement 2015** – COP21)

Evolution of **sustainable connectivity** & support of **insular communities** of the Archipelago

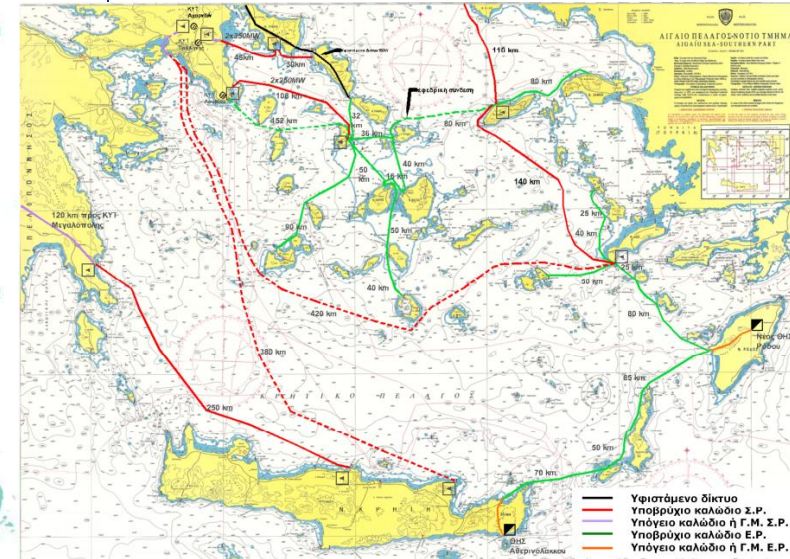


The case of Greece

- Archipelagic state
- Subsidies on unsustainable lines
- Hub and spoke system from to Piraeus
- Limited mobility and island interconnections
- More than 40 short sea ferry connections



National NG Pipeline system
Source: www.desfa.gr, 2016



Current & provisional electric connections
Aegean Sea Source: www.desmie.gr, 2010



Concluding, is there Room for two?

- ✓ Both LNG and Electrification could work as growth boosters
- ✓ Technologies complementing each other
- ✓ Small scale LNG may be developed for bunkering small scale local use and electricity
- ✓ Renewables -wind & solar- could play a vital role in islands mobility
- ✓ Synergy could create a sea of opportunity



SEANERGY



Thank You!

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Piraeus Business Development



Working together
for a safer world

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