



# CORE LNGas hive + HIVE2 PUERTO DE TARRAGONA Jornada de divulgación del uso del GNL en un entorno portuario



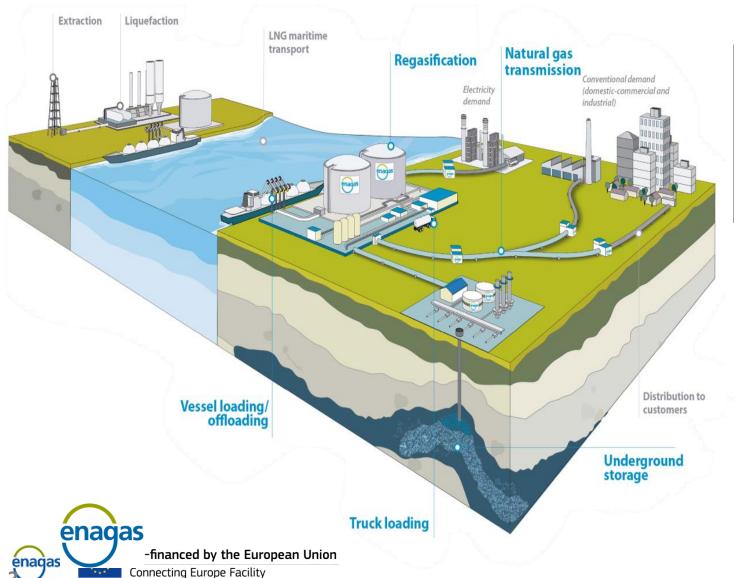


#### **About Enagas**

#### A midstream company

#### **Leader in natural gas and LNG infrastructures**

Major International player as a result of our technological expertise, gas infrastructure construction skills, highly effective operations and maintenance programs and sound financial structure.

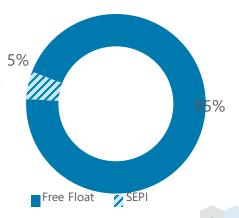


European Union-accredited independent TSO

**Top natural gas transmission company** in Spain

**Technical Manager** of Spain's Gas System

#### **Ownership structure**



**CORE I NGas** 

hive

#### **Enagas LNG terminals**

Enagás has built 13 LNG storage tanks in Spain since 2002

8 LNG terminals (+2 in development) Mexico TLA Altamira LNG Terminal (40%) 300,000 m3 LNG 800,000 m3 (n)/h **GNL Quintero LNG Terminal** Chile (majority shareholder 60,4%) 334,000 m3 LNG 625,000 m3 (n)/h Canary Islands LNG terminals 300,000 m3 LNG

El Musel LNG Terminal 300,000 m³ LNG 800,000 m³ (n)/h

> Bilbao LNG Terminal (50%) 450,000 m3 LNG 800,000 m³ (n)/h



Barcelona LNG Term 760,000 m<sup>3</sup> LNG 1,950,000 m<sup>3</sup> (n)/h



Sagunto LNG Term 600,000 m<sup>3</sup> LNG 1,000,000 m<sup>3</sup> (n)/h



Cartagena LNG Terminal 587,000 m<sup>3</sup> LNG 1,350,000 m<sup>3</sup> (n)/h



Spain

Huelva LNG Terminal 619,500 m<sup>3</sup> LNG 1,350,000 m<sup>3</sup> (n)/h



Company of the world with more LNG terminals



#### **Enagas Around the World**

#### **Spain**

6 LNG terminals (+2 in development) ~11.000 km high pressure pipelines 3 underground storage facilities







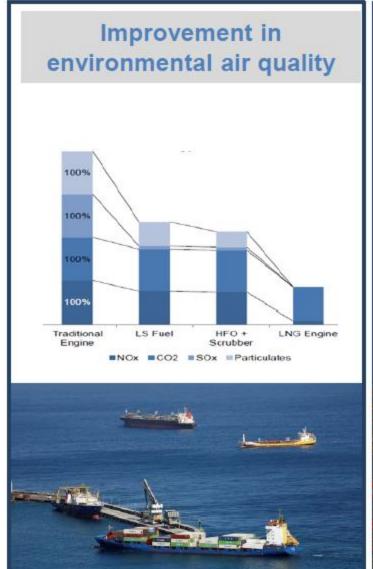
## Why LNG in a Vessel, Port, and ... in a City?







#### The answers (\*):













#### Impacting globally and locally







#### Improvement of Air Quality

The Maritime Sector responsible of:



9% of SOx world emissions.

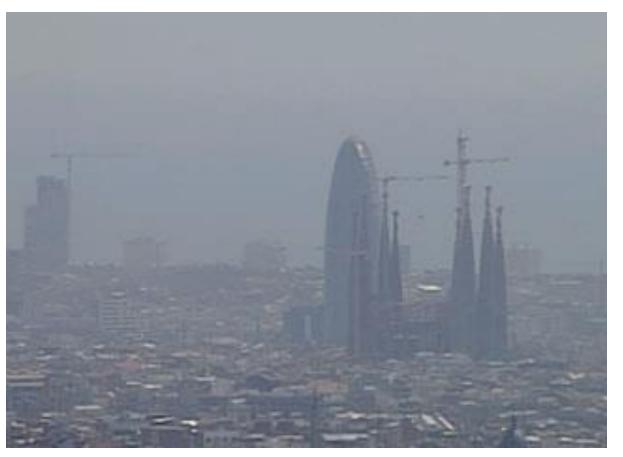






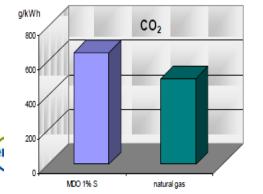
#### Natural Gas - LNG : a sustainable fuel

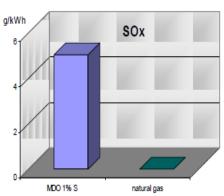
The unique complete alternative to maritime fuels

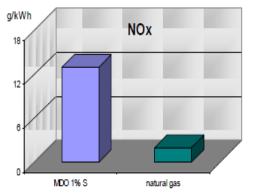


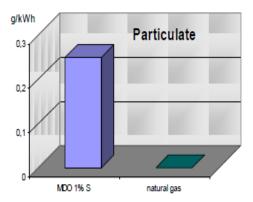
#### **LNG impact vs MDO 1%:**

- **✓ Elimination of SOx**
- ✓ Reduction of 90% NOx
- ✓ Elimination of solid particles. PM
- ✓ Reduction of +20% CO2



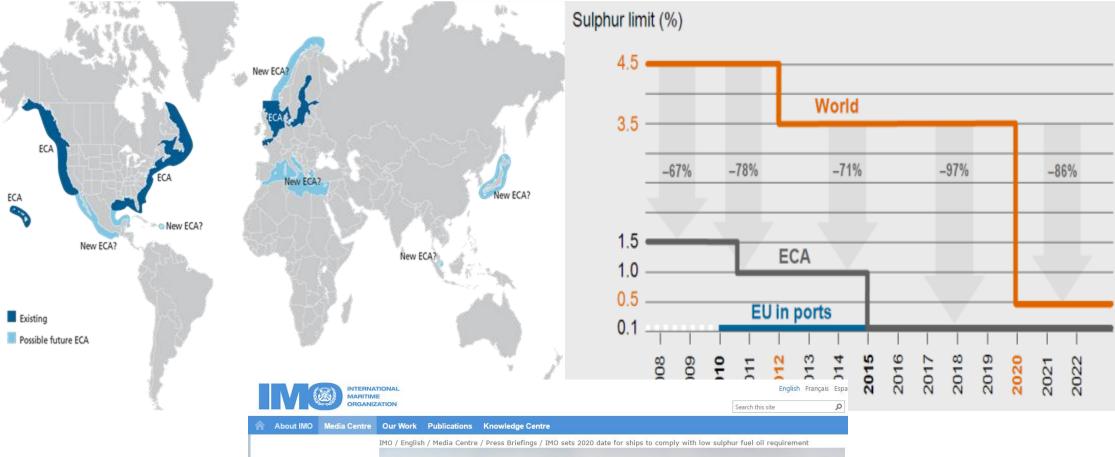






#### Environmental Maritime regulations

#### MARPOL - INTERNATIONAL MARITIME ORGANIZATION



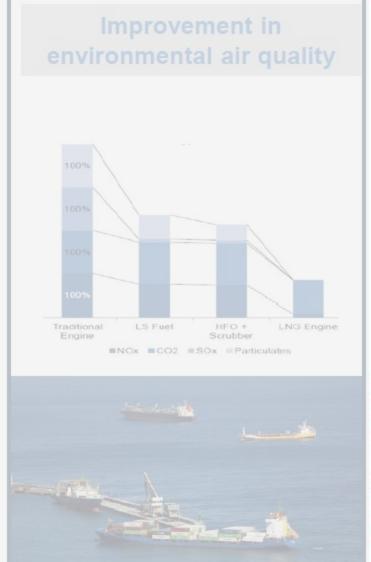








#### The answers:















#### LNG Price Competitiveness









#### 1.2 2ª «C».- Conveniencia

### «La apuesta por el LNG significa reducir la factura de bunker en un 35% referido al MGO»

«Apostar por el desarrollo sostenible incrementa nuestra reputación»



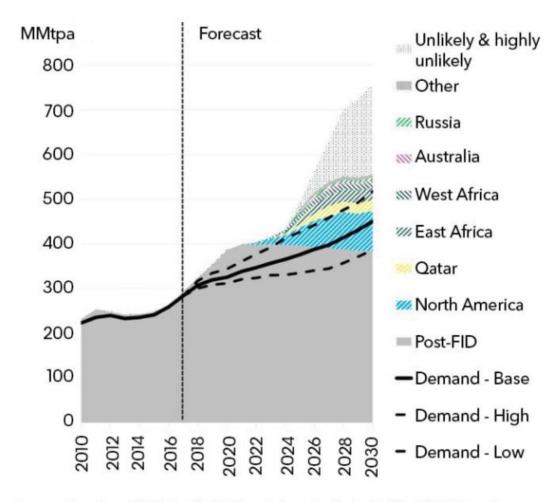






#### LNG: a high available fuel

#### Global LNG supply and demand



Source: Bloomberg NEF. Note: The likelihood of a project being built by 2030 is based on BNEF's assessment of the project's regulatory stage, size, infrastructure, developers' financial strength, secured offtake contracts, sovereign risks, etc.







#### The answers:











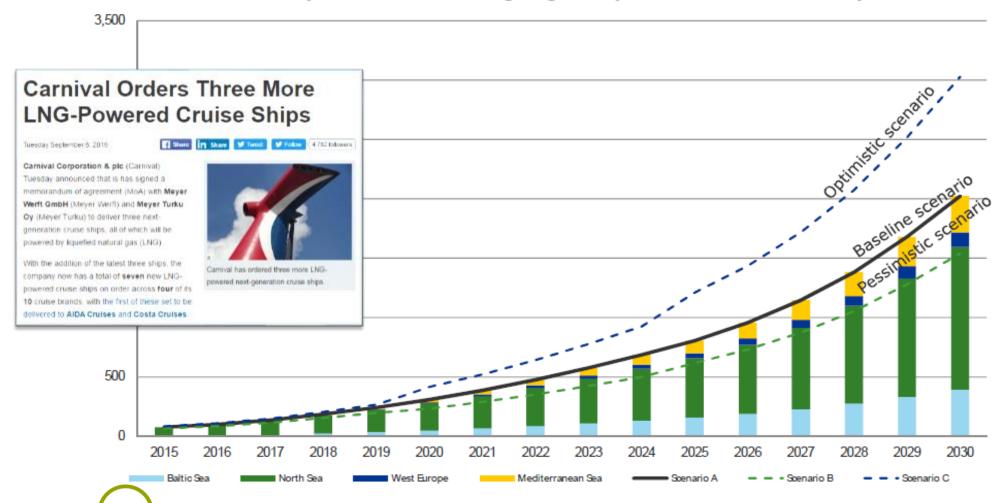




#### Atracttion of LNG fueled ships

Prediction of LNG-powered vessels in Europe.

#### DNV GL prediction of ocean going LNG-powered vessels in Europe to 2030



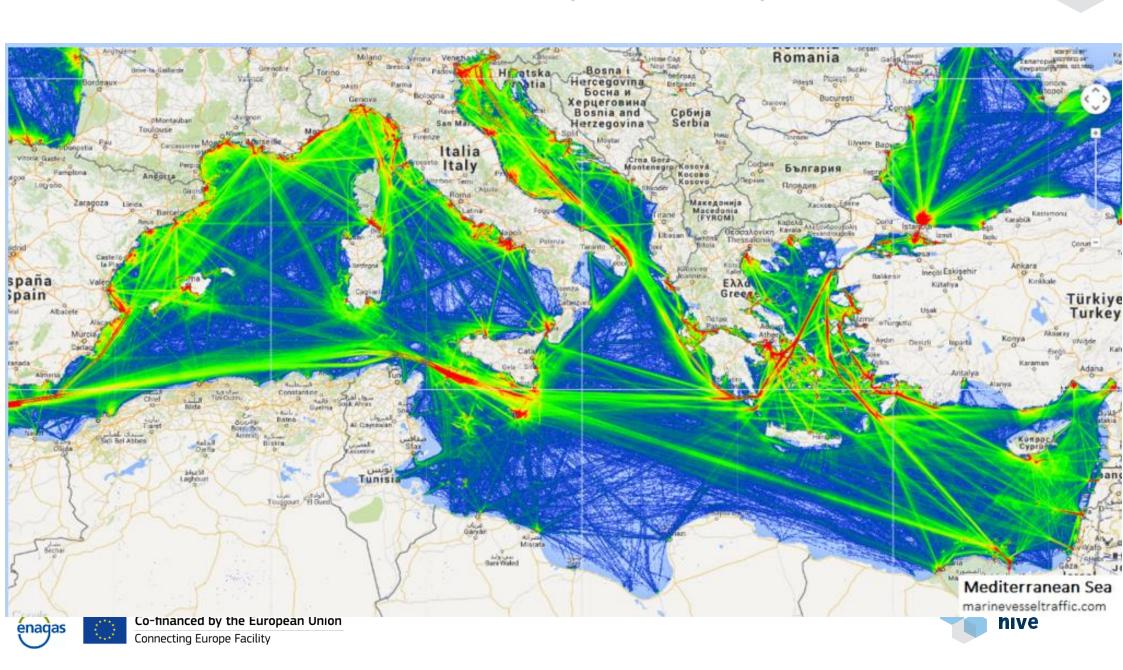




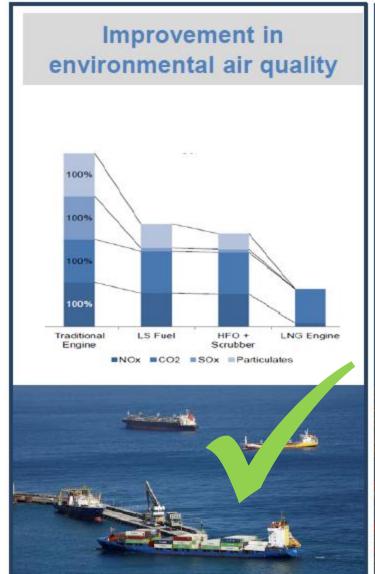


#### Atracttion of LNG fueled ships

Where to bunker LNG? The competition is open...



#### The answers:















# OK... But we need to develop infrastructures, technology and regulation







## To solve it we promote in the Iberian peninsula this project:









#### Objectives of the action



**DEVELOPMENT OF** 

#### LNG BUNKERING

IN SPAIN AND PORTUGAL



#### REGULATION AND NORMATIVE DEVELOPMENT

To make a proposal of the National Policy Framework, in view of fulfilling the requirements of the **Directive** 2014/94/EU



#### INFRASTRUCTURE DEVELOPMENT

To define a **roadmap** and an **investment plan to scale up the results** of the Action







#### **Key Aspects**



#### **PARTNERS**

42

8 Public Partners
13 Port Authorities
21 Industrial Partners
(NG operators, ship owners, external services)

#### TIMETABLE OF THE ACTION

2014-2020

NUMBER OF PROJECTS

**25** 

**TOTAL BUDGET** 

33,3 M€







#### **Partners**

































































































#### Stakeholders





































































#### Stakeholders





































































#### Stakeholders











































#### TRANSVERSAL STUDIES



#### NATIONAL POLICY FRAMEWORK

- National Objectives
  - Incentives
- Measures to promote demand
  - Observatory

## TECHNICAL, SAFETY ENVIRONMENTAL SPECIFICATIONS

- Bunker infrastructures
  - Use of LNG in port environment

## LNG ADVANCE TRAINING REQUIREMENTS

- Training needs
- Training centers
- Accreditation processes

- Improve social perception
- Advantages of the product
- Smooth landing of LNG







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## REGULATION, NORMATIVE, MARKET TRANSVERSAL STUDIES. LNG ADVANCE TRAINING

#### **REQUIREMENTS**

#### **DRAFT FINAL REPORT IN PROGRESS**

BLOCK I: DEFINITION OF OPERATIONS AND IDENTIFICATION OF PROFILES

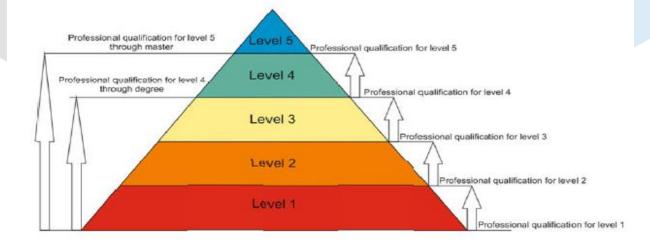
- Operations defined in two groups: bunkering operations and supply chain operations
- Profiles defined according to operations
- Profiles classified in vocational education and university level based on the basic and advanced classification of maritime training

BLOCK II:
DEFINITION OF
CONTENTS

- Contents defined for vocational education and university profiles – analogously to maritime's basic and advanced levels
- Vocational education contents defined according to current criteria for training in regasification plants
- University modules defined according to managing and engineering necessities in operations

BLOCK III:
PROPOSAL OF
ACCREDITATION
PATH

- Accreditation path for vocational education proposed based on path already started in Spain
- European Professional Card to be the base of vocational education accreditation
- University modules based on ECTS European Credit Transfer System – fulfilling European requirements





#### TRANSVERSAL STUDIES



#### NATIONAL POLICY FRAMEWORK

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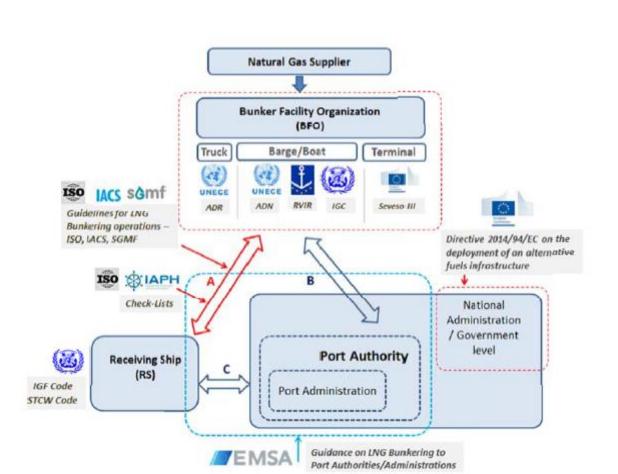








#### TRANSVERSAL STUDIES











#### MARKET ANALYSIS & LOGISTIC CHAIN

LNG DEMAND AND SUPPLY CHAIN ATLANTIC CORRIDOR

LNG DEMAND AND SUPPLY CHAIN GIBRALTAR STRAIT & PERIPHERAL REGIONS



 along the Iberian façades of the corridors
 To define the most suitable logistic solution depending on distance and demand

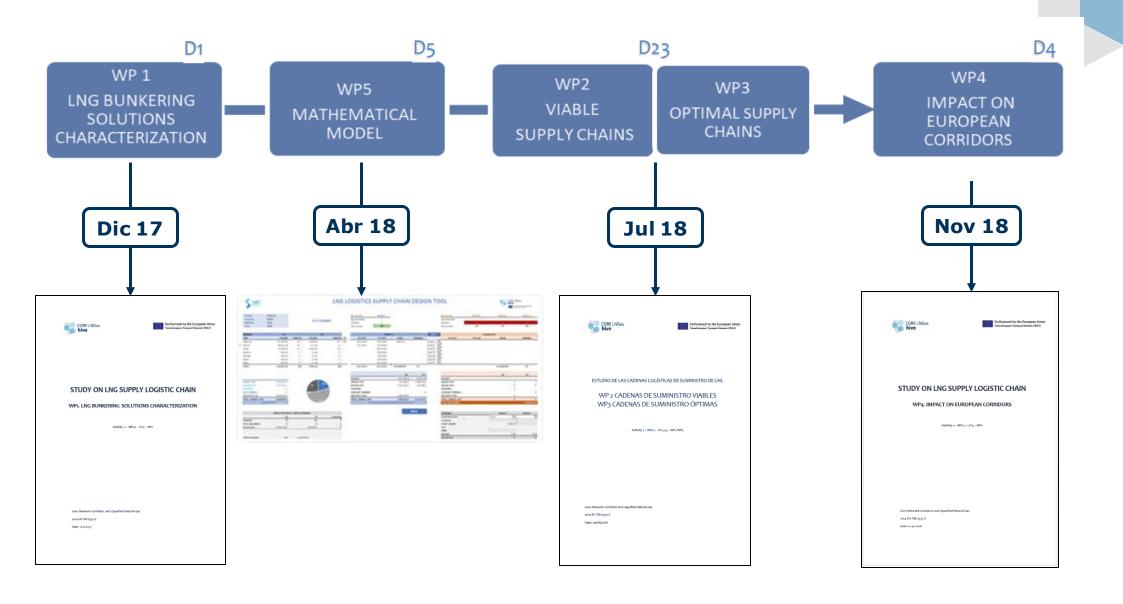
To foresee LNG demand

 To analyze different business models

LNG DEMAND AND SUPPLY CHAIN MEDITERRANEAN CORRIDOR

http://www.corelngashive.eu/

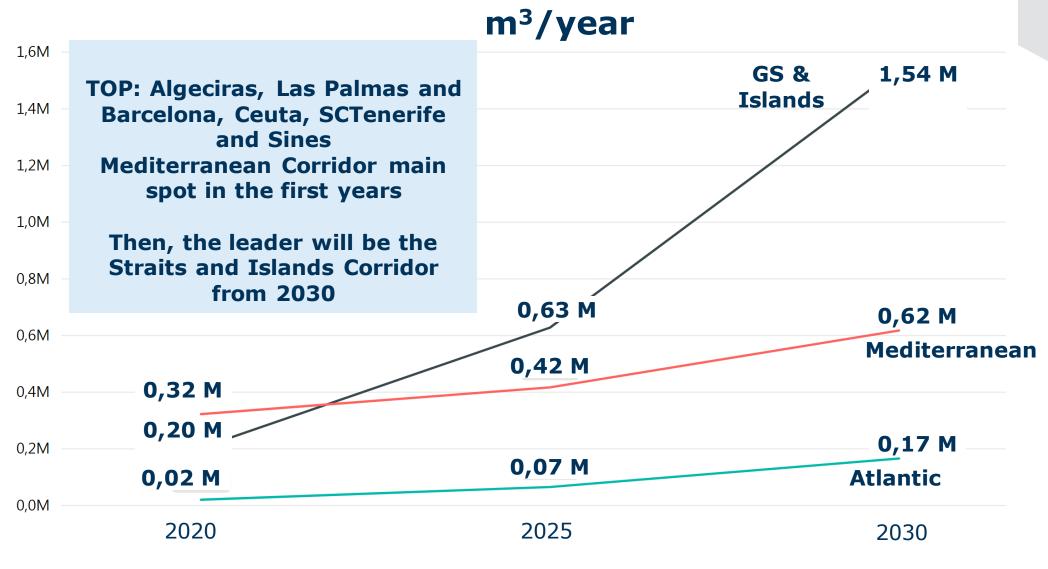






#### **DEMAND STUDY. Preliminary Data**

Conclusions



<sup>\*</sup> base scenario data

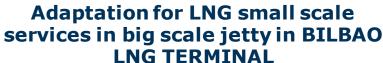
Total year 2050 = 8 M m<sup>3</sup>/year





#### INFRASTRUCTURE, EQUIPMENTS

#### ADAPTATION OF LNG TERMINALS FOR BUNKERING







**Engineering for new dedicated LNG** jetty in MUGARDOS LNG TERMINAL



**Adaptation for LNG mixed** bunker/big/small scale services in existing jetty

**Adaptation for LNG** bunkering/small scale services in **REGASIFICATION PLANT OF SAGUNTO** 



**CARTAGENA:** dedicated LNG mooring jetty for small scale services

Multimodal LNG bunker berth in PORT OF HUELVA











#### INFRASTRUCTURE, EQUIPMENTS

#### BUNKERING BARGES AND MOLTIMODAL LOGISTIC











EPM2: Barge retrofit for LNG bunkering within the port









#### INFRASTRUCTURE, EQUIPMENTS

#### LNG UTILIZATION IN PORTS















Retrofit study of a port locomotive powered by LNG in Tarragona port





Construction of a LNG/CNG mixed station for vehicles and small boats in Valencia port

LNG Powered electricity generator mobile unit for Offshore Power Supply





Design of a tugboat powered by LNG in Valencia port

### What's Next?:





#### **HIVE 2**\_KEY ASPECTS OF THE GLOBAL PROJECT

**GLOBAL PROJECT:** 

HIVE 2

**PARTNERS:** 

ENAGÁS, BALEÀRIA, NATURGY, RENFE, MARFLET & more TIME PLAN OF THE ACTION

2018-2023

NUMBER OF 2018 SELECTED ACTIONS

2 twinned actions

**TOTAL BUDGET** 

**GP €185 m** 

(€73.7 m eligible costs of the 2 selected Actions)

#### OBJECTIVES OF THE GLOBAL PROJECT

LAUNCHING HIVE 2 STRATEGY



**SUPPLY AND DEMAND PROJECTS** 



#### SUPPLY RELATED PROJECTS

Bunkering ships and adaptations of regasification plants to provide LNG bunkering services, thereby fulfilling the requirements of the **Directive** 2014/94/EU

LNG supply services for dry ports



#### **DEMAND RELATED PROJECTS**

**Adaptation of 5 ROPAX ferries that** will be fueled by LNG

More demand projects in the future



#### GOALS OF THE GLOBAL PROJECT



All regasification plants infrastructure in operation adapted for the supply of LNG bunker and small scale services



**Boosting the Spanish LNG fueled fleet**, ex. adapting 5 ROPAX ferries by Baleària



Introducing LNG fuel in a maritime-rail corridors between maritime ports and dry ports, including LNG supply services



Enabling the Iberian Peninsula to offer holistic solutions to the new requirements of the shipping sector by building **new LNG** ships that will provide LNG bunkering services



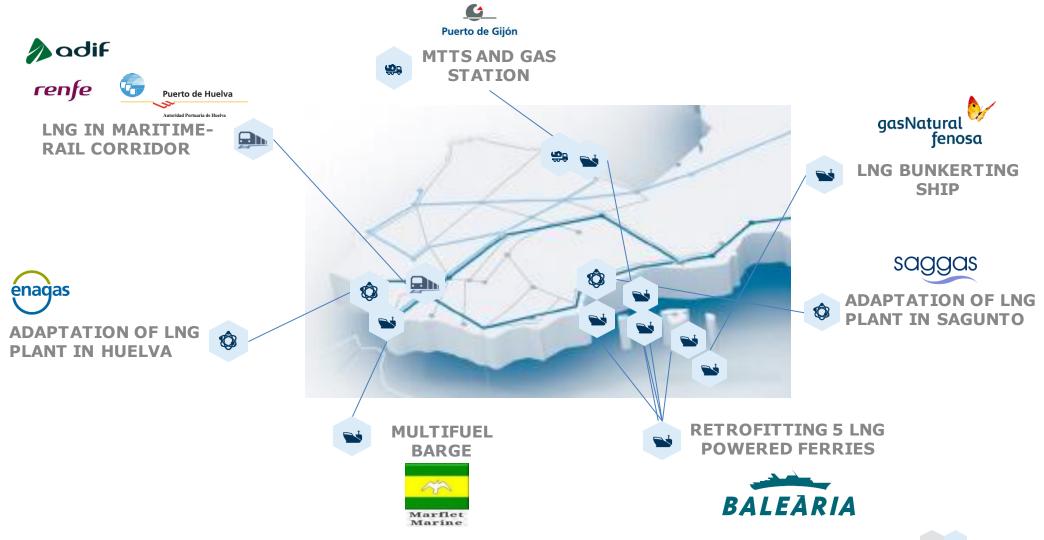






#### DEPLOYMENT OF DEMAND AND SUPPLY PROJECTS

### LNG BUNKERING STATIONS, LNG BUNKERING SHIP AND LNG POWERED FERRIES





#### **CONCLUSIONS**

- The new maritime regulation and the environmental objetives imply the introduction of low-emissions fuels.
- LNG is the real competitive and available alternative in heavy duty transport: Vessels, Rail and Trucks.
- Infraestructure, technology and regulation is needed.
- LNG is key for port competitiveness.
- In Spain a Portugal, HIVE project is helping with a solution .

## **Moltes Gràcies**



www.corelngashive.eu



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