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Liquefied Natural Gas (LNG) in shipping and ports

FUNDING LNG BUNKERING SYSTEMS FOR EUROPEAN PORTS: FROM THEORY TO PRACTICE



IAME Conference 2019
June 25th -28th Athens (Greece)



I A M E
2019
ATHENS
GREECE

Agenda



1. Background

2. Rationale of the study & research objectives

3. Data & method

4. Results

- ✓ LNG bunkering in EU ports: the institutional and legal framework
- ✓ Funding schemes and financial instruments for LNG-bunkering in ports
- ✓ Case studies: planning and financing new solutions for LNG bunkering in Italian and French ports

5. Implications & conclusion

Background



- Growing EU attention towards decarbonization: the role of the **maritime transport industry** (EC, 2013; 2016).
 - ✓ Shipping generated around 2.8% of annual Greenhouse Gas Emissions (GHG) in the 2007-2012 period (IMO, 2014); nonetheless emissions from the industry are predicted to increase up to 250% by 2050 (EC, 2013).
 - ✓ Environmental concerns are urged by the high concentration of the emissions in coastal areas and in port regions (Tzannatos, 2010).
- Relatedly, EU decided to act simultaneously on two main levels:
 - ✓ **Strengthening the rules** on shipping emissions;
 - ✓ **Promoting greener transport infrastructure** and alternative fuels such as **Liquefied Natural Gas (LNG)**.
- EC is stimulating the LNG industry on the demand/supply sides (Verhoeven, 2009; Cariou et al, 2014):
 - ✓ funding programs that facilitate investments in LNG technologies among ship-owners/shipping companies;
 - ✓ Funding programs for terminal operators/port managing bodies in the EU.

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Research objectives



- **RO.1:** To provide an in-depth analysis of the **EU policies** that governs the adoption and diffusion of LNG as alternative fuel in the shipping and port industry.
- **RO.2:** To develop an overarching conceptual framework on the most suitable **funding solutions for financing public and private investments** in LNG bunkering systems within European ports.
- **RO.3:** To **empirically test the conceptual framework** developed by mapping the most relevant projects co-funded by the EU for developing LNG bunkering facilities embedded in ports located within the Mediterranean cross border maritime regions of both Italy and France.

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Data & method



➤ RO.1: EU policies

- ✓ **Introduction** of the international regulatory framework that governs the adoption of LNG technologies within the shipping and port domain.
- ✓ **Exhaustive review** of the EU laws and regulations (regulations and rules, directives, soft laws and guidelines).

➤ RO.2: Funding solutions for financing public and private investments

- ✓ **EU funding schemes & programs** applicable for financing LNG bunkering facilities (desk research).
- ✓ Identification of suitable funding solutions (**CEF, Horizon 2020, CF, ERDF, EFSI, INTERREG Maritime Program, and the Europe 2020 Project Bond Initiative**).
- ✓ **Technical sheet** (for each sample program): eligible actors; eligible investments; min/max size of the projects; window for submitting the proposal; funding schemes/grants from the EU; etc).

➤ RO.3: Empirically test the conceptual framework

- ✓ **Empirically test** on a specific geographic area (the Italy-France maritime area) stressing the role of cross border collaborating programs.

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LNG bunkering in EU ports: the institutional and legal framework

- **International level** – International Maritime Organization (IMO) through the MARPOL Convention.
- **European level** – Complex picture of the legal and regulatory framework across EU countries:
 - DAFI (Directive 2014/94/EU): it imposes the deployment of alternative fuels infrastructure and the presence of re-fuelling facilities for LNG in TEN-T core ports by 31 December 2025.
 - European Maritime Safety Agency EMSA: it works on the development of mechanisms to support the implementation and uniform enforcement of Directive 2014/94/EU, especially through EMSA LNG Bunkering Guidance for Port Authorities and Administrations.
- **National level** – Heterogenous states of the art



Funding schemes and financial instruments for LNG-bunkering in ports

European Programs/Funding schemes scrutinized

- Connecting European facility (CEF)
- Horizon 2020
- Cohesion Fund (CF)
- The European Regional Development Fund (ERDF)
- The European Fund for Strategic Investments (EFSI)
- European Territorial Cooperation (ETC) – INTERREG
- Europe 2020 Project Bond Initiative

Information gathered

- ✓ Funding scheme/financial instrument
- ✓ Eligible actors/subject/etc. (type, size, etc.)
- ✓ Types of eligible investments (e.g. research study, preliminary projects, executive projects, infrastructure development and construction, etc.)
- ✓ Minimum/maximum size of the projects
- ✓ Window for submitting the proposal
- ✓ Type of financial resources provided at the European or national level
- ✓ Timing of the project



Funding schemes and financial instruments for LNG-bunkering in ports



Funding scheme/financial instrument	Allocated budget	Aim	Reference legislation
CEF	€27.4 billion €22.4 billion for Transport, €4.7 billion for Energy, €0.3 billion for Telecom	EU funding instrument to promote growth, jobs and competitiveness through targeted infrastructure investment at European level. It supports the development of high performing, sustainable and efficiently interconnected trans-European networks in the fields of transport, energy and digital services. CEF investments fill the missing links in Europe's energy, transport and digital backbone	Regulation (EU) No 1316/2013 of the European Parliament and of the Council of 11 December 2013 establishing the Connecting Europe Facility, amending Regulation (EU) No 913/2010 and repealing Regulations (EC) No 680/2007 and (EC) No 67/2010 (OJ L 348, 20.12.2013).
H2020	€6,6 billion in innovative technologies and environmental protection in the transport sector.	Horizon 2020 is the biggest EU Research and Innovation programme ever with nearly €80 billion of funding available over 7 years (2014 to 2020) – in addition to the private investment that this money will attract. It promises more breakthroughs, discoveries and world-firsts by taking great ideas from the lab to the market. H2020 provide support for research and innovation with regard to alternative fuel vehicles and the related infrastructure, in particular through the Societal Challenge 'Smart, green and integrated transport'. That specific source of financing should also contribute to the development of alternative fuels infra-structure and should be fully considered as an additional opportunity to ensure a sustainable mobility market throughout the Union	Regulation (EU) No 1291/2013 of the European Parliament and of the Council of 11 December 2013 establishing Horizon 2020 — the Framework Programme for Research and Innovation (2014-2020) and repealing Decision No 1982/2006/EC
CF	€ 63.4 billion to activities under the following categories: -trans-European transport networks, notably priority projects of European interest as identified by the EU. The Cohesion Fund will support infrastructure projects under the Connecting Europe Facility; - environment: here, the Cohesion Fund can also support projects related to energy or transport, as long as they clearly benefit the environment in terms of energy efficiency, use of renewable energy, developing rail transport, supporting intermodality, strengthening public	The Cohesion Fund is aimed at Member States whose Gross National Income (GNI) per inhabitant is less than 90 % of the EU average. It aims to reduce economic and social disparities and to promote sustainable development. The Cohesion Fund concerns Bulgaria, Croatia, Cyprus, the Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia and Slovenia.	Article 177 (in particular the second paragraph thereof) of the Treaty on the Functioning of the European Union (TFEU). Council Regulation (EU) No 1300/2013 of 17 December 2013 on the Cohesion Fund and repealing Council Regulation (EC) No 1084/2006

Funding schemes and financial instruments for LNG-bunkering in ports



Funding scheme/financial instrument	Allocated budget	Aim	Reference legislation
EFSI	€500 billion	The European Fund for Strategic Investments (EFSI), also called the Juncker Plan, is an initiative of EIB Group and the European Commission aimed at boosting the economy through mobilising private financing for strategic investments.	Regulations (EU) No 1316/2013 and (EU) 2015/1017
ERDF	200 billion	<p>The ERDF aims to strengthen economic and social cohesion in the European Union by correcting imbalances between its regions. The ERDF focuses its investments on several key priority areas. This is known as 'thematic concentration': Innovation and research, The digital agenda, Support for small and medium-sized enterprises (SMEs), The low-carbon economy. The ERDF resources allocated to these priorities will depend on the category of region. In more developed regions, at least 80 % of funds must focus on at least two of these priorities; In transition regions, this focus is for 60 % of the funds;</p> <p>This is 50 % in less developed regions.</p> <p>Furthermore, some ERDF resources must be channelled specifically towards low-carbon economy projects: More developed regions: 20%; Transition regions: 15%; and Less developed regions: 12%.</p>	Articles 174 to 178 of the Treaty on the Functioning of the European Union (TFEU) Regulation (EU) No 1303/2013 of the European Parliament and of the Council of 17 December 2013 laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and laying down general provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund and repealing Council Regulation (EC) No 1083/2006. Regulation (EU) No 1301/2013 of the European Parliament and of the Council of 17 December 2013 on the European Regional Development Fund and on specific provisions concerning the Investment for growth and jobs goal and repealing Regulation (EC) No 1080/2006.
PBI	230 million	The Project Bond initiative is a joint initiative by the European Commission and the EIB. Its objective is to stimulate capital market financing for large-scale infrastructure projects in the sectors of transport (TEN-T), energy (TEN-E) and information and communication technology (ICT). According to the Commission, the European Union's infrastructure investment needs to meet the Europe 2020 objectives in these sectors could reach as much as EUR 2 trillion. The Project Bond initiative is designed to enable eligible infrastructure projects promoters, usually public private partnerships (PPP), to attract additional private finance from institutional investors such as insurance companies and pension	



Work in Progress

Planning and financing new solutions for LNG bunkering in Italian and French ports

Project type

European Program/Funding schemes	No. of projects
TEN-T & CEF	33
H2020	2

Geographic coverage

Geographic scope	No. of projects
North Europe	19
South Europe	12
Muti-area	4

European Project focused on the South Europe	Including both Italy & France	Including only France	Including only Italy	Not including neither Italy or France	
12	1	4	5	2	12
European Project - Multiarea	Including both Italy & France	Including only France	Including only Italy	Not including neither Italy or France	
4	3	1	0	0	4
					16

Work in Progress

CODE	Titolo del report	Focus	Mappatura domanda bunkering GNL (si/no)	Mappatura offerta bunkering GNL (si/no)	Copertura geografica Area/Paese	Paesi	Porti dell'area obiettivo esaminati nel documento	Orizzonte temporale del report
A1	Costa II East-Poseidon Med	Infrastrutture per GNL			Europa (Mediterraneo)	Grecia, Cipro, Italia, Croazia, Slovenia		12/2013-12/2015 (progetto concluso)
A7	SEAGAS	Implementazione impianti di bunkeraggio GNL		SI	Europa (Mediterraneo)	Francia e Spagna	Porto di Roscoff (Francia) e di Santander (Spagna)	01/2012-12/2015 (progetto concluso)
A8	LNG Masterplan for Rhine-Main-Danube	Implementazione GNL come carburante	SI	SI	Europa (Multiarea)	Austria, Belgio, Bulgaria, Repubblica Ceca, Francia, Germania, Italia, Lussemburgo, Paesi Bassi, Romania, Slovacchia, Cipro		01/2013-12/2015 (progetto concluso)
A10	Green technologies and eco-efficient alternatives for cranes & operations at port container terminals (GREENCRANES)	Green technologies			Europa (Mediterraneo)	Spagna, Slovenia, Italia	Porto di Valencia (Spagna), Koper (Slovenia), Livorno (Italia)	08/2012-05/2014 (progetto concluso)
A11	COSTA	GNL come sistema propulsivo delle navi			Europa (Mediterraneo)	Spagna, Portogallo, Italia, Grecia		02/2012-04/2014 (progetto concluso)
A12	S/F SamueLNG for a Blue Atlantic Arch	GNL come sistema propulsivo delle navi	SI		Europa (Multiarea)	Francia, Spagna, Germania	Porto di Nantes Saint-Nazaire, Gijon, Vigo, le Havre, Rouen	08/2016-06/2019 (processo in corso)
A13	Sustainable LNG Operations for Ports and Shipping - Innovative Pilot Actions (GAINN4MOS)	Progetto di bunkeraggio del GNL	SI	SI	Europa (Mediterraneo)	Spagna, Francia, Italia, Portogallo e Slovenia	Porti di Capodistria, La Spezia, Venezia, Fos-Marseille, Nantes-Saint-Nazaire	01/2015-09/2019 (progetto in corso)
A18	GAINN4CORE	Reti italiane per la distribuzione di GNL		SI	Europa (Mediterraneo)	Italia	Genova, La Spezia, Livorno (rete Tirreno-Ligure), Ravenna e Venezia (rete Adriatico-Ionica)	06/2015-09/2019 (progetto in corso)
A25	LNG Logistics	Sviluppare una rete di distribuzione europea di GNL per vie navigabili interne			Europa (Mediterraneo)	Francia	Porto di Marseille fino al porto di Dijon	08/2016-10/2018 (progetto in corso)
A26	BioMovLNG	Infrastrutture per produzione stoccaggio di GNL		SI	Europa (Mediterraneo)	Francia		01/2015-09/2018 (progetto in corso)
A27	Boosting Energy Sustainable fuels for freight Transport in European motorWays (BESTWay)	Infrastrutture bunkering GNL		SI	Europa (Mediterraneo)	Spagna, Francia		09/2014-06/2018 (progetto in corso)
A31	GAINN4MED 2016-IT-TM-0284-S Italy	Promuovere utilizzo di combustibili alternativi, trasporti multimodali		SI	Europa (Mediterraneo)	Italia		03/2017-03/2020 (progetto in corso)
A33	HDGAS Heavy Duty Gas Engines integrated into Vehicles	"GREEN VEHICLES" PRIORITY	SI		Europa (Multiarea)	Austria, Italia, Germania, Francia	No	2015-05-01 to 2018-10-31 (progetto in corso)
A34	LeanShips Low Energy And Near to zero emissions Ships	"WATERBORNE" Priority	SI		Europa (Multiarea)	Italy, Germany, France, Switzerland	No	2015-05-01 to 2019-04-30 (progetto in corso)

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Implications & conclusion

Academic implications:

- Overarching framework for assessing funding solutions related to financing public/private investments in LNG bunkering systems within European ports.
- Mixed approach that combine both juridical and financial perspectives.

Practical implications:

- Better understanding of the concrete implications of the EU legal framework for PAs in terms of funding, co-funding & cooperation between countries.
- Ongoing development on LNG infrastructure in the Southern ports ('behind' those of Northern ones).
- New policies of port stakeholders encouraged by EU funds and constrained by greener port legislations (Italian and French cases).
- Insights on the situation of the Southern European ports allow policymakers to make a pre-evaluation of their strategies in light of this ECA project (see the French and Italian case)