Development of the European small scale LNG infrastructure: Status and Outlook

Marion Nikodym
GIE Vice-Executive Secretary

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Who we are

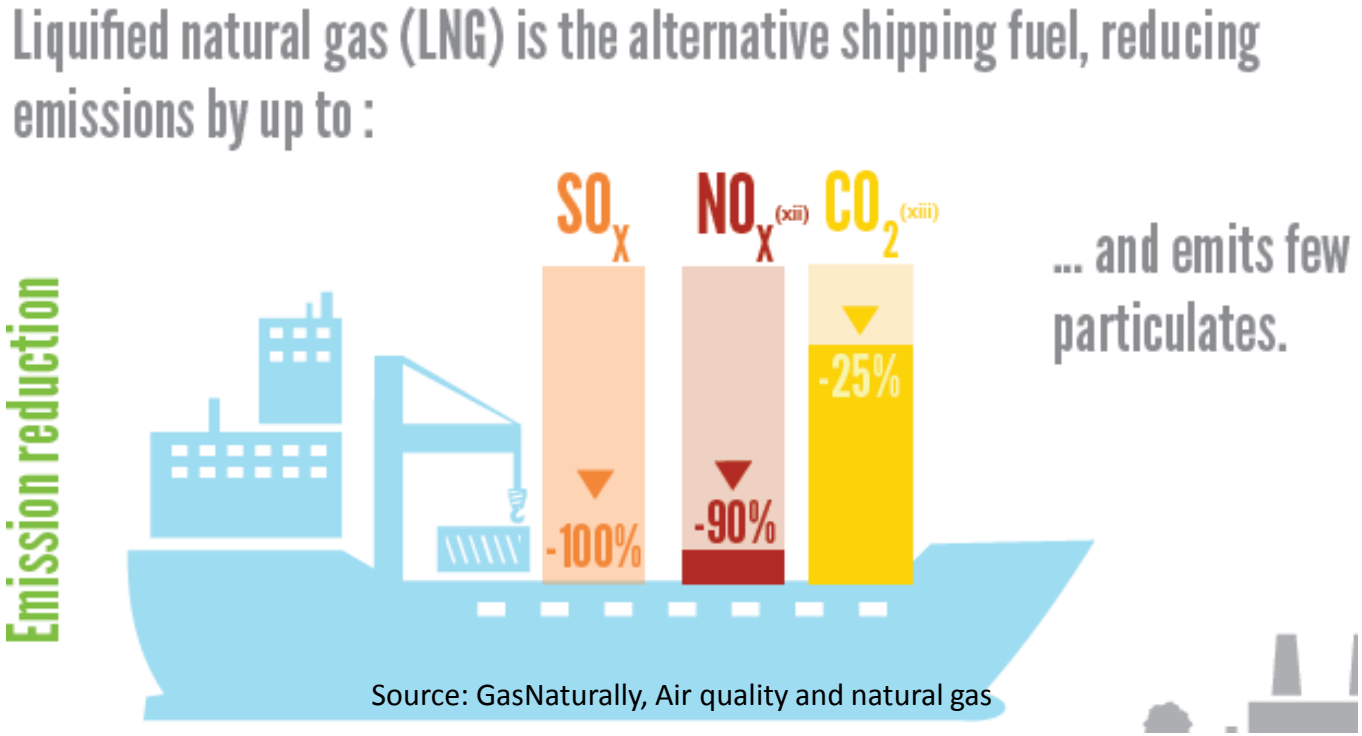
- GLE is one of the three columns of GIE (Gas Infrastructure Europe), the European association of the Transmission, Storage and LNG Terminal Operators
- GLE membership:
  - 15 member companies
  - 9 countries
  - 1 observer

GLE represents about 85% of regasification capacity in Europe and ca. 90% of regasification capacity in the EU

Why small scale LNG?

Environmental emissions:
Stricter requirements and increasing taxation

Transport sector responsible for around one quarter of the EU's Greenhouse (GHG) emissions being the second biggest emitter behind the energy sector.



Source: GasNaturally, Air quality and natural gas

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Small scale LNG infrastructure network

- **LNG import terminals offering small scale services**

- **LNG small scale liquefaction plants**
  LNG is produced in small scale liquefaction plants to supply peak shaving demands, as well as to make available natural gas to regions that need it but where it is not economically or technically feasible to build new pipelines.

- **LNG (stationary) bunkering facilities for vessels**

- **LNG satellite storage**
  They enable the use of Natural Gas off pipeline locations. LNG is delivered by trucks or by small LNG transport ships to satellite stations. Then the LNG is either distributed by trucks to the end users or it is regasified and injected into the natural gas distribution networks.

- **LNG refuelling stations for trucks**

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LNG terminals in Europe

EXISTING

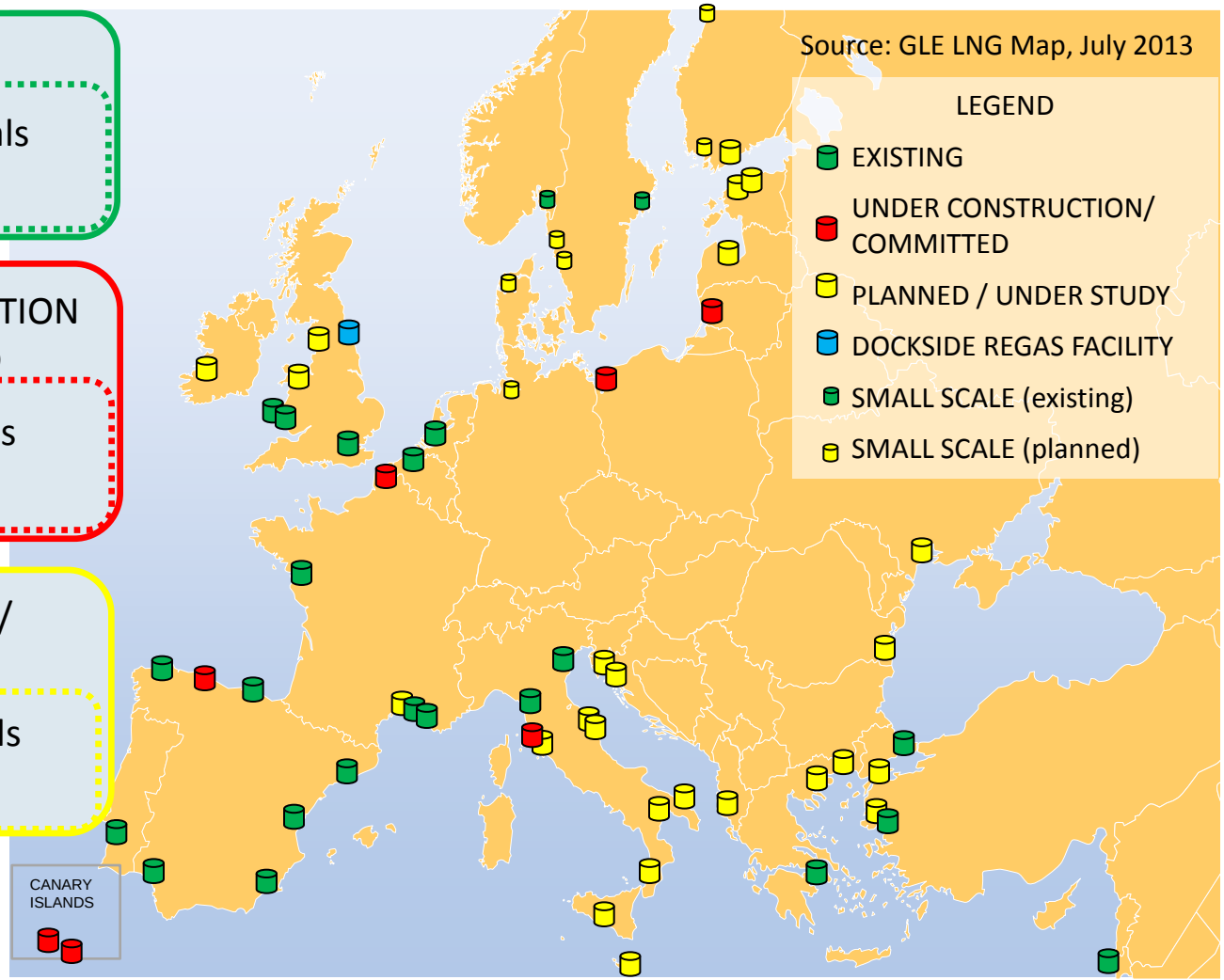
21 LNG Terminals
(190 bcm)

UNDER CONSTRUCTION / COMMITTED

7 LNG Terminals
(35 bcm)

UNDER STUDY / PLANNED

32 LNG Terminals
(>160 bcm)



Detailed information on LNG terminals available at http://www.gie.eu/index.php/maps-data/lng-map

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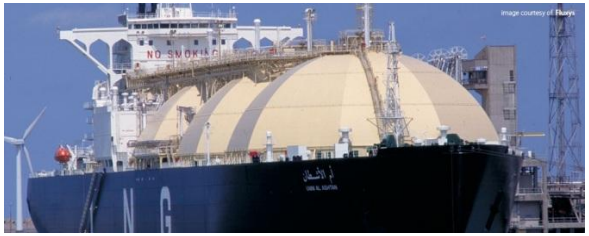
Small scale LNG services of terminal operators

- **Reloading**
  Transfer of LNG via the terminal into (smaller size) vessels
- **Trans-shipment**
  Transfer of LNG from one vessel to another
- **Loading of bunkering ships**
  LNG is loaded on bunkering ships which transport LNG in smaller quantities
- **Truck loading**
  LNG is loaded on tank trucks which transport LNG in smaller quantities
- **Rail loading**
  LNG is loaded on rail tanks which transport LNG in smaller quantities



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Barriers to be overcome: Infrastructure

Main barrier against widespread uptake of Small Scale LNG: Lack of supply infrastructure

- Current value chain of LNG is built up to deliver **full sized LNG carrier cargoes**, about 150,000 m3, to receiving terminals for re-gasification and distribution through gas pipelines.

- Infrastructure is not developed enough to supply ships, trucks, buses, and trains with the **quantity they require** and at the **geographical locations they need** to have a secure and efficient supply.

- The LNG value chain needs **innovation and investment** in order to be able to increase small scale LNG volumes. Existing related infrastructures (i.e. LNG plants, gas pipelines) should be integrated, as much as possible, into the supply chain of alternative fuels (natural gas) in order to avoid unnecessary investments.

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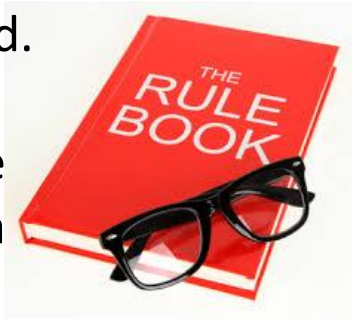
Barriers to be overcome: Legislative framework I

LNG has not been handled in small quantities in populated areas and near the general public. Consequently, there has been no need to develop legislation that governs this type of operations.

- In most countries, this means that project specific risk analysis, operational procedures, etc. need to be developed.



- This is an extra burden on a project, and may often be time consuming, especially because most Authorities will have a quite a steep learning curve to climb before they can make reasonably sound judgements on the matter.

- It is recommended that further research is undertaken into potential policy measures and how they should be implemented to achieve the desired results.

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Barriers to be overcome: Legislative framework II

Measures to be considered with the greatest potential are:

- Measures aimed at incentivising the investment in small scale services at LNG terminals and provision of natural gas refuelling infrastructure should be considered.

- Introduction of vehicle purchase/substitution subsidies, and subsidised loans for the purchase of natural gas trucks and ships (or their conversion).

- Taxation-based measures, such as reduced taxation schemes for natural gas fuels.

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Ongoing development: Legislative framework

Clean Power for Transport Package

announced by the European Commission on 24 January 2013:

European Commission

- LNG is used for waterborne transport both at sea and on inland waterways. LNG infrastructure for fuelling vessels is at a very early stage, with only Sweden having a small scale LNG bunkering facility for sea going vessels, with plans in several other Member States. The Commission is proposing that **LNG refuelling stations be installed in all 139 maritime and inland ports** on the Trans European Core Network **by 2020 and respectively 2025**.

- LNG is also used for trucks, but there are only 38 filling stations in the EU. The Commission is proposing that **by 2020, refuelling stations are installed every 400 km** along the roads of the Trans European Core Network.

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Ongoing development: Other activities

- **Small scale services offered by LSOs**

  An increasing number of European LNG terminals are offering and will offer small scale services in the near future.

- **Port initiatives**

  The large North European Ports Rotterdam, Zeebrugge, Hamburg, Antwerp and several others communicated plans for LNG availability within the next few years.

- **Standardisation**

  On 6 June 2013, the long awaited ISO Technical Specification of LNG bunkering was published on the International Association of Oil & Gas producers' (OGP) website for review.
  The document has been issued for pre-standardisation purposes with the intent to develop it over time into an ISO International Standard.

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GLE small scale LNG Initiatives I

GLE Position Paper:
Overcoming barriers in the small scale LNG development

- The small scale LNG development is strongly driven by policies and targets to reduce emissions and increase the sustainability of the transport sector. New emissions control regulations are making LNG an increasingly attractive option for the (short sea) shipping sector as well as for heavy road transport.
- The technologies for handling large and small scale LNG are worldwide available.
- Main barriers to be overcome are the poor infrastructure and the missing consistent normative and regulatory framework which includes safety standards for the handling of small scale LNG.
- Outlook: There is an impressive amount of on-going work to break through the barriers to implement LNG as a fuel.

Published in July 2013

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GLE small scale LNG Initiatives II

Development of a map showing the small scale LNG infrastructure in Europe

- GLE members are interested in supporting the development of small scale LNG in Europe
- The GLE small scale LNG map will support the Clean Power for Transport package from the European Commission not only by showing existing small scale LNG infrastructure and projects, but also by identifying missing links in the network. In addition to the transport sector, the study shall support the development of the use of LNG in off pipeline locations.
- The map shall be available by the end of 2013

Scope of work available on www.gie.eu

GIE is proud to support

gas naturally

making a clean future real

Gas Naturally

GN is a campaign to showcase the essential role of natural gas in the forthcoming energy revolution. The mitigation of climate change has become one of the most important issues for the gas industry.

Thank you
for your kind attention.

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