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*GIE Position Paper*

# LNG as the fuel of choice for road and maritime transportation: the case for (Small-Scale) LNG in Europe

## Highlights

**LNG contributes to the decarbonization of road and maritime transportation:**

- ✓ It is the fastest growing gas supply source globally;
- ✓ It contributes to achieving the Paris Agreement goals in an affordable way;
- ✓ It improves air quality, especially in ports;
- ✓ It has a 15-25 % greenhouse gas (GHG) emissions reduction potential for heavy-duty vehicles and shipping;
- ✓ Biomethane and bioLNG offer almost 100% GHG emissions reduction;
- ✓ The technology of gas engines is mature and supported by major industry players;
- ✓ The use of LNG as a fuel eliminates the emission of sulphur oxides (SOx), hardly any particle emissions, and reduces by an order of magnitude emissions of nitrogen oxides (NOx) compared to diesel, marine gas oil (MGO) or heavy fuel oil (HFO).

**GIE welcomes the initiatives undertaken to support the use of LNG as an alternative fuel for transport:**

- ✓ the **European Maritime Safety Agency** (**EMSA) guidance on LNG bunkering** prepared in close cooperation with the European Commission, member states and industry within the context of the European Sustainable Shipping Forum;
- ✓ European Commission`s efforts to have **harmonised EU standards at national levels;**
- ✓ a **stable regulatory framework for LNG** within the internal energy market. There is no need for further regulation;
- ✓ the Commission`s initiative on the **alternative fuels for sustainable mobility in Europe by implementing the Directive on Alternative Fuels Infrastructure (DAFI)** in the member states;
- ✓ the current existence of **financial instruments** (i.e. TEN-T or the lending of the European Investment Bank).

**GIE asks for further measures that accelerate the use of LNG as an alternative fuel for transport. GIE commits to work with EU policy makers to enable:**

- ✓ the **proper implementation of DAFI** as a key element of LNG uptake. LNG refueling infrastructure should be further developed to facilitate a homogeneous market throughout Europe;
- ✓ the extension of the **"Sulphur Emission Control Areas" (SECA)** zone to whole European coastline;
- ✓ the classification of **Small Scale LNG infrastructure projects as sustainable** within the European Commission`s Sustainable Finance Programme;
- ✓ The recognition of **bio LNG as part of the circular economy**;
- ✓ A **strengthening of the emissions controls and sanctions** in case of breach;
- ✓ A framework ensuring that **emission issues are not transferred from air to sea water**.

**Introduction**

Through the Paris Agreement targets have been agreed globally to combat climate change and to accelerate and intensify the actions and investments needed for a sustainable low carbon future. The world currently emits 32 billion tonnes of energy-related CO2 each year. To limit the rise in global temperature to 2°C, the IEA has calculated that energy related CO2 emissions need to fall to around 18 billion tonnes a year by 2040[1]. In response, environmental regulations and emission limits of fuels are getting more and more tight.

Next to greenhouse gas emissions (GHG) also other aspects of the environmental performance of fuels are increasingly under scrutiny. Sulfur and nitrous oxides emissions, fine particles emissions and even noise pollution are seen to be a problem associated with traditional fuels such as diesel and fuel oil. This paper presents the case for small-scale LNG as the fuel of choice for road and marine transportation in light of these developments.

**The need for transition to cleaner fuels for transport**

The transport sector amounts to almost one quarter of greenhouse gas emissions (GHG) in the European Union (EU). Natural gas has a 15[2]-25[3]% GHG emissions-reduction potential for heavy-duty vehicles and shipping. The technology of gas engines is mature and supported by major industry players like Wartsila, Iveco and Volvo. Feedstock for LNG is traditionally natural gas. However, renewable power and biogas produced out of waste can be used as feedstock and are key to producing renewable bioLNG. Additionally, bioLNG offers a compatible mix with, or in some cases a replacement to, LNG and may exhibit in excellent environmental credentials (Box 1). Biomethane and bioLNG offer almost 100% GHG emissions reduction. These are therefore important components in achieving the emission targets in the EU to meet the Paris Agreement.

**Box 1. Progress is being made in Norway – BioLNG plant produces renewable natural gas for public transport**

The world`s largest bioLNG plant has been installed at the Norske Skog Skogn paper mill. The plant will convert the cleaned biogas from fishery waste and residual paper mill slurry into liquid bioLNG fuel[4].

Over the past decade, shipping and road transportation have seen a surge of environmental regulations. Impact on shipping and road transportation in the next five years will include:

- Next to existing sulphur caps in SECA zones, a global sulphur limit for ship fuels, as set by the International Maritime Organization (IMO)
- IMO Tier III requirements for limiting nitrogen oxides (NOx) in Emission Control Areas (ECAs)
- European Comission`s Directive on the deployment of alternative fuels infrastructure (2014/94/EU) (DAFI)

[1] World Energy Outlook 2017
[2] NGVA, Greenhouse gas intensity from natural gas in transport, http://ngvemissionsstudy.eu/
[3] European Commission Staff Working Document: Actions towards a comprehensive EU framework on LNG for shipping, 24 - 1 - 2013, pg. 6
[4] NGVG Global, Huge BioLNG plant produces RNG for Norwegian public transport, http://www.ngvglobal.com/blog/huge-biolng-plant-produces-rng-for-norwegian-public-transport-0903#more-55185

Liquified natural gas (LNG) in transportation is a proven and available solution for a lower carbon economy. It is the cleanest fuel available today for shipping and heavy-duty road transportation. The use of LNG as a fuel eliminates the emission of sulphur oxides (SOx), hardly any particle emissions, and reduces by an order of magnitude emissions of nitrogen oxides (NOx) compared to diesel, marine gas oil (MGO) or heavy fuel oil (HFO)[5].

Gas engines, gas turbines and LNG storage and processing systems have been available for land installations for decades. LNG sea transport by LNG carriers also has a history going back to the middle of the last century. Today, the LNG market is already well supplied with mature technology currently under deployment. While conventional oil-based fuels will likely remain the main fuel option for most existing vessels in the near future, the commercial opportunities of LNG are interesting especially for newbuild projects.

**What is LNG?**

The main component of LNG, methane (CH4), has more or less the same composition as the natural gas used in households, for power generation, and in industrial processes. LNG is a clear, colorless and non-toxic liquid which forms when natural gas is cooled to -162ºC. The cooling process shrinks the volume of the gas 600 times, making it easier and safer to store and ship.

**What is Small Scale LNG?**

Small-scale LNG keeps the gas in liquid form for use as a fuel, sometimes in areas that are not connected to the natural gas grid (Image 1). The relevant market is in transport, meaning shipping and heavy road transport, where it competes with traditional fuels like diesel and heavy fuel oil. LNG is applicable in numerous cases and scope, including its use as a fuel for locomotive rolling stock or electricity production, i.e. (small) power plants running remote from natural gas pipeline supply networks where natural gas that is stored on site as LNG. In this paper, the focus will be the use of LNG as fuel for road and maritime transportation.

**Image 1. Small Scale LNG Chain**

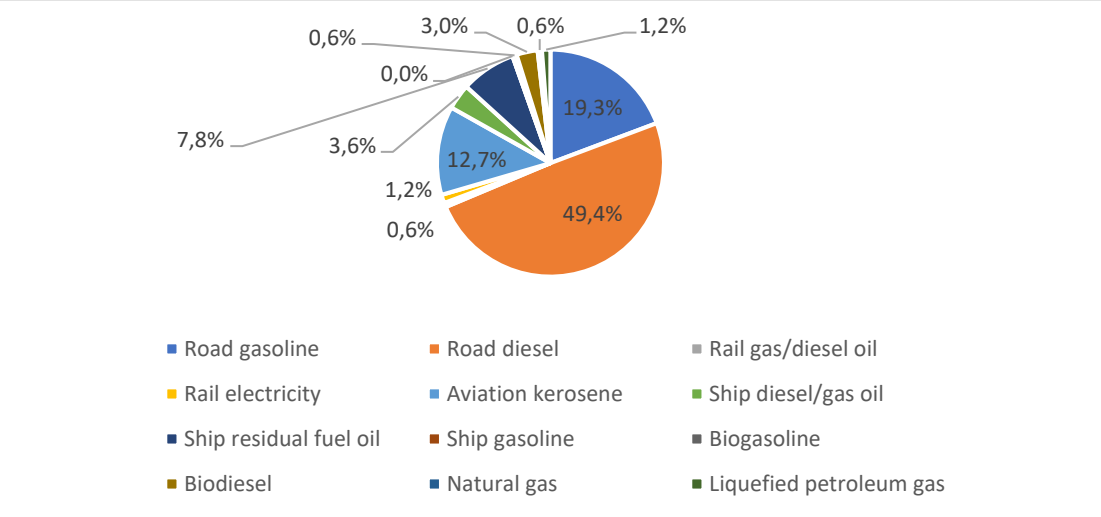
Source: World Bank, Mini / Micro LNG for commercialization of small volumes of associated gas[6]

[5] DNV GL, Assessment of selected alternative fuels and technologies, June 2018

[6] http://documents.worldbank.org/curated/en/299861484716073109/pdf/112131-WP-MiniMicroLNGforcommercializationofsmallvolumesofassociatedgas-PUBLIC-v2.pdf

LNG as land and marine transport fuel is already established in some areas of Europe but is still an emerging market (Figure 1). In recent years, awareness of the opportunities of LNG fuel has increased and a multitude of activities has been initiated to develop the market.

**Figure 1. Energy consumption in transport**




Source: European Environment Agency (2015)

**(Small Scale) LNG benefits as an alternative fuel for transportation**

There are several factors that underpin the choice of LNG over other transportation fuels for the road and maritime industry. The critical considerations are economic and environmental factors, the availability and momentum of LNG and the maturity of the market.

The key drivers for (SS)LNG developments are:

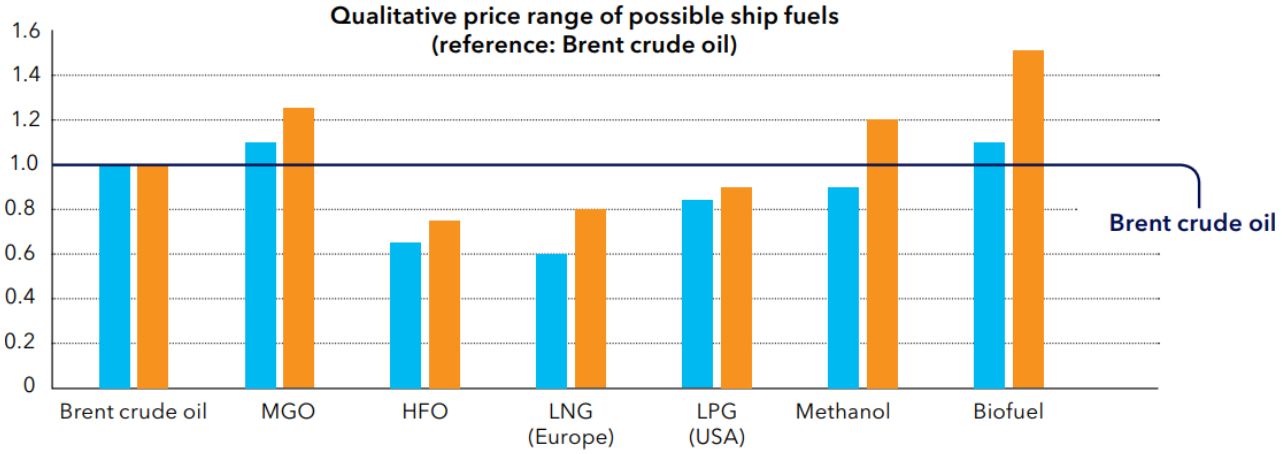
*Economics*

**LNG contributes to achieving the Paris Agreement goals in an affordable way.** Fuel pricing depends on a number of factors, including market conditions, which are difficult or impossible to predict. For international shipping it should be noted that subsidies for preferred fuels do not exist because ship fuels are tax-fee already. It remains to be seen whether this will change, for example through the introduction of a CO2 fee scheme. The restrictions illustrated in Figure 2 reveal a qualitative trend based on price history.

In Europe, LNG competes directly with the price of pipeline gas. LNG that is fed into the grid can only be marginally more expensive than pipeline gas. The calculations for the diagram use the gas price on the European spot market as a basis for LNG price predictions. The natural gas price in Japan is always an LNG price because the country imports all of its natural gas as LNG. Today, the gas prices in Japan and Europe are gradually aligning. The European and Japanese LNG price can be regarded as an indicator for the worldwide LNG prices regardless of major local deviations. It should be noted that these diagrams do not account for LNG distribution costs.

The diagram demonstrates that only LNG and, to some extent, LPG can currently compete with HFO in terms of market price. Methanol and biofuels may eventually be able to compete with MGO to some extent. Hydrogen is not price-competitive at this moment.

**Figure 2. Are alternative fuels for shipping too expensive?**




| | Brent crude oil | MGO | HFO | LNG (Europe) | LPG (USA) | Methanol | Biofuel |
|---|---|---|---|---|---|---|---|
| min. | 1 | 1.1 | 0.65 | 0.6 | 0.85 | 0.9 | 1.1 |
| max. | 1 | 1.25 | 0.75 | 0.8 | 0.9 | 1.2 | 1.5 |

Source: DNV GL, Alternative fuels and technologies for greener shipping

*Environmental*

**LNG brings attractive environmental benefits** both to gas production as well as end-customer use (LNG for transport / power & heating generation) compared to alternative fossil fuels. This includes CO2, SOx, NOx, particles and noise emissions reduction and even elimination. Based on the MARCOGAZ' position paper "CH4 emissions in the European Natural Gas midstream sectors" and the data provided by GIE members, the total amount of methane emitted from LNG terminals in 2015 is estimated to be 0.002% of the total gas sales in EU 28. LNG terminal operators are strongly committed to minimizing methane emissions released during operation and maintenance activities and are implementing the best available techniques to achieve this goal. A common methodology (including the reporting methodology) and a set of recommendations related to the methane emissions are needed. For this reason, the gas industry is involved in several initiatives[7].

DNV GL[8] predicts that the LNG powered fleet size[9] will increase by more than a third (35%) by 2050. The vessels operate primarily or exclusively in areas subject to the IMO limit on Sulphur of 0.1 per cent – the Emission Control Areas in N America and the Caribbean, and the Baltic and North Sea. Whilst all vessels will be subject to the 0.5% cap from 2020, the existing 0.1% cap will make **LNG an even more favorable option as it improves air quality, especially in ports/harbors** (Box 2). Future NOx and PM regulatory limits are still under development.

In particular also with Arctic routes opening up for shipping, a major concern emerges through the deposition of black soot resulting from emissions from heavy-fuel oil by ships taking these routes. The black soot

[7] GIE, GIE position paper on methane emissions, https://www.gie.eu/index.php/gie-publications/position-papers
[8] 2018 Energy Transition Outlook – Maritime Forecast 2050
[9] measured in deadweight tonnes (DWT)

accelerates the decrease of ice caps and contributes to global sea-level rise. This could be avoided through the use of LNG as a fuel.

**Box 2. Improving air quality in harbors/ports**

Most of the cruise ships directly enter the city harbors, e.g. in Hamburg cruise ships are responsible for about 38% of the city`s NOx emissions[10] and are a major source of fine particles emissions as engines keep running even when at berth to produce power. LNG is a solution and this is increasingly being recognized by the industry. As an example, the world's first liquefied natural gas (LNG) powered cruise ship Aida (Image 2) was "christened" in autumn 2018[11].

**Image 2. LNG fueled cruise ship Aida**


Source: www.aida.de

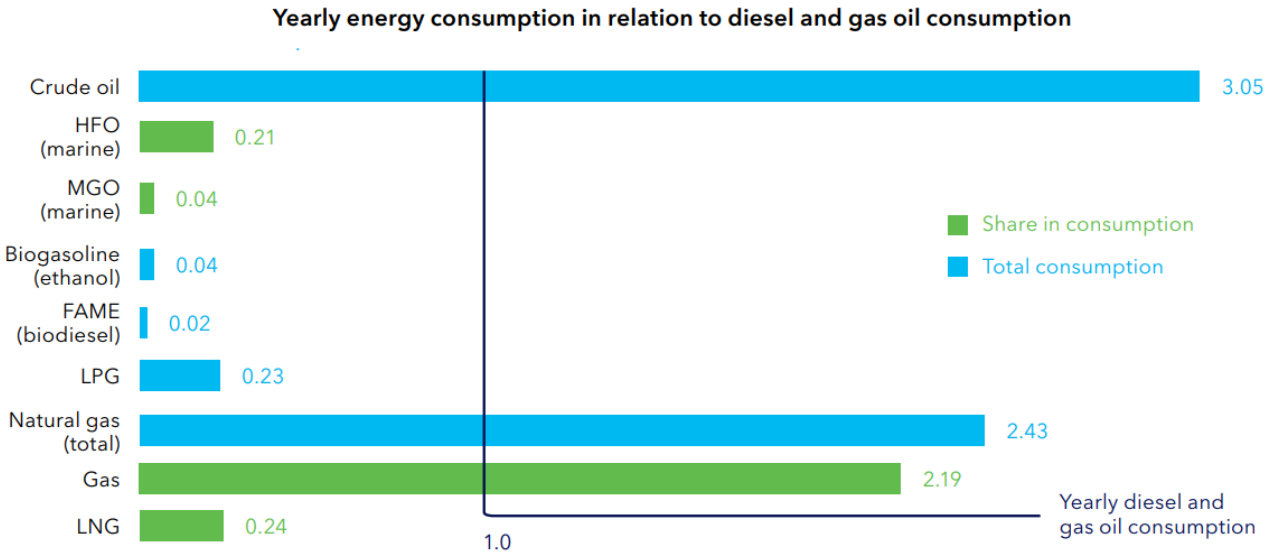
The combined amount of HFO and MGO consumed by ships accounts for no more than 25% of the global diesel fuel and petrol consumption (2016 figures). This is roughly equivalent to the amount of energy consumed using LNG, respectively 24%. LNG represents only a small portion (approximately 10%) of the overall gas market (Figure 3).

Provided that the IMO regulations are enforced as of 2020, up to 48 million tonnes of ship fuel containing 0.1% or less of sulphur will be consumed annually from that time onwards. Most of the fuel consumed (70-88 %) will have a sulphur content between 0.1%-0.5%.

[10] Sebastian Timmerberg, Martin Kaltschmitt, Umwelt- und Klimabilanz von LNG in der Schifffahrt, Technische Universitaet Hamburg

[11] https://www.lngworldshipping.com/news/view,cruise-ships-add-new-dimension-to-lng-passenger-fleet_51765.htm

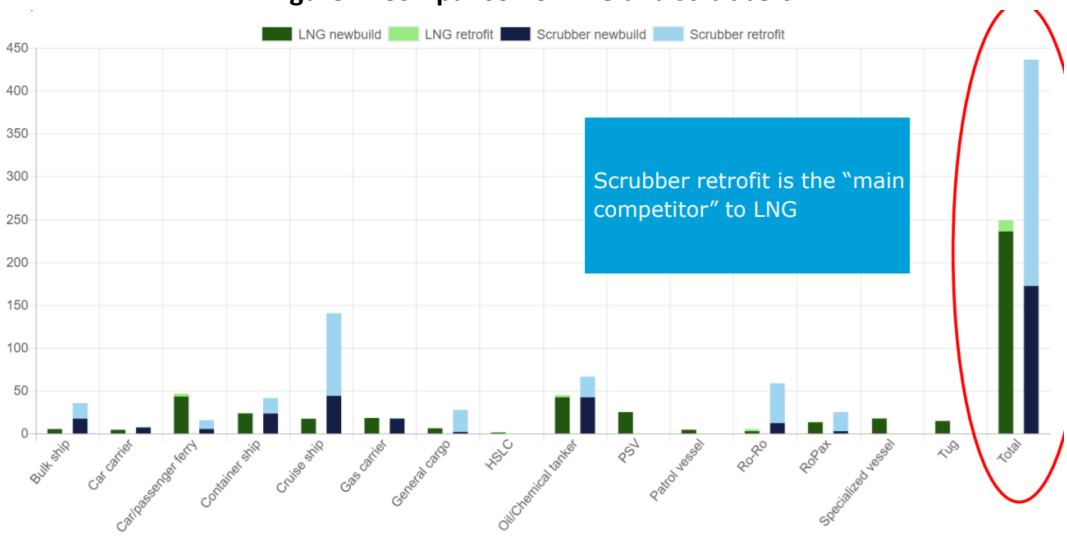
**Figure 3. Ship fuel consumption is much lower than diesel and gas oil consumption**




Source: DNV GL, Alternative fuels and technologies for greener shipping

According to DNV GL, the main competitor to LNG are scrubbers[12]. Investments in scrubbers are higher in total numbers, however LNG is the most frequent choice for newbuild ships (Figure 4).

**Figure 4. Comparison of LNG and scrubbers**




Source: DNV GL[13]

[12] A scrubber is a system used to remove unwanted pollutants from a ship engine exhaust. http://www.shippipedia.com/scrubber/

[13] http://www.golng.eu/files/Main/20180417/2.%20Ole%20Vidar%20Nilsen%20-%20DNV%20GL.pdf

**LNG powered engines also run more silent then conventionally powered engines.** Dutch supermarkets started using LNG trucks to deliver food to the markets at night, because they are more quiet than trucks running on diesel and can therefore meet the strict local regulations on noise.

*Sector integration*

SSLNG allows the replacement of the more polluting fossil fuels in the following sectors: transportation, heating and cooling, Industry, (decentralized) power generation and other off-grid destinations/consumers.

*Availability*

**LNG is rapidly playing a bigger role in the energy mix.** LNG trade increased from 100 million tonnes in 2000 to nearly 300 million tonnes in 2017[14].

**LNG is the fastest growing gas supply source.** Theoretically, a switchover of the entire global shipping fleet to LNG would be possible today since the current LNG production is higher than the shipping industry's energy requirement, and the actual share of LNG in the total gas market is only 10%. For all alternative fuels, with the exception of LNG, a rapid rise in demand would require massive investments in production capacity[15].

*Momentum*

Significant number of first-mover initiatives with an increasing number of ships adopting LNG as a fuel (Box 3). There are currently 247 confirmed LNG fueled ships[16] and 110 additional LNG ready ships. By 2020, 500 LNG fueled ships are expected to be reached[17].

**Box 3. CMA CGM will be the first to fuel ultra-large container ships with LNG**

CMA CGM's nine 22,000 teu, LNG-fuelled container ships are due for delivery between late 2019 and late 2020. They will be the largest container ships ever built and the first vessels of their type to operate on LNG[18].

*Mature technology currently under deployment*

Gas engines, gas turbines and LNG storage and processing systems have been available for land installations for decades. LNG sea transport by LNG carrier also has a history going back to the middle of the last century. Developments to use LNG fuel in general shipping began early in the current century. Today, the technology required for using LNG as ship fuel is readily available. Piston engines and gas turbines, several LNG storage tank types as well as process equipment are also commercially available[19].

*Existing LNG Infrastructure is a starting point to deliver to Small Scale LNG projects/volumes*

A significant example is the LNG Blue Corridors project (Box 4).

[14] https://www.shell.com/energy-and-innovation/natural-gas/liquefied-natural-gas-lng/lng-outlook.html
[15] DNV GL, Alternative fuels and technologies for greener shipping, June 2018
[16] 121 LNG fuelled ships in operation, 126 LNG fuelled ships in order
[17] DNV GL, LNG regulatory update, http://www.golng.eu/files/Main/20180417/2.%20Ole%20Vidar%20Nilsen%20-%20DNV%20GL.pdf
[18] https://www.lngworldshipping.com/news/view,cma-cgm-orders-spawn-lng-fuel-oems-collaboration_54003.htm
[19] DNV GL, Assessment of selected alternative fuels and technologies, June 2018

**Box 4. LNG Blue Corridors**

The LNG Blue Corridors[20] project aims to establish LNG as a real alternative for medium- and long-distance transport — first as a complementary fuel and later as an adequate substitute for diesel. At the end of April 2018, the project was seen as fulfilling its initial targets with a fleet of 140 LNG trucks having covered over 31.5 million kilometers while consuming in total about 14,200 tons of LNG. The volumes were distributed in 111,000 refueling operations completed in 12 stations of the project, both permanent and mobile, at critical locations along four corridors covering the Atlantic area, the Mediterranean region, and connecting Europe from south to north and west to east[21].

**Small scale LNG – recent and future infrastructure developments**

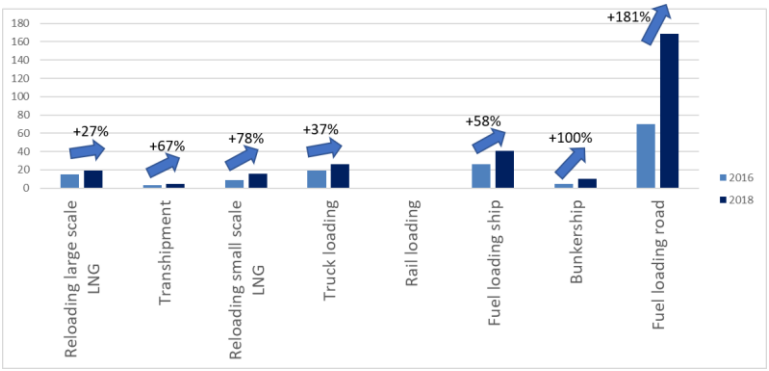
Small-scale LNG is developing as a reliable and effective solution for off-grid energy supply and as the fuel of choice for clean road and maritime transportation. This is confirmed by the 2018 GLE LNG New Services Inventory and List of Services, which include the most actual data from the European LNG terminal operators.

The GLE Small Scale LNG database and map[22] provide the LNG industry and interested parties with an overview of the available, under construction and planned small-scale LNG infrastructure and services in Europe.

**Truck loading facilities increased with 37% compared to last year, according to the GLE Small Scale LNG Database (Figure 6).** Amongst others, this confirms LNG`s role as a viable solution for remote and off-grid energy supply and cleaner fuels. The use of LNG as a cleaner fuel is also highlighted by the increase in number of the LNG stations across Europe as observed in the 2018 GLE SSLNG map.

**The fact that the number bunkership needed to supply LNG powered ships doubled compared to 2017 demonstrate that marine use of LNG is becoming increasingly popular (Figure 6).** And this is gaining more and more consideration as many experts recognize its superior performance compared to other types of fuel when faced with increasingly stringent environmental regulatory requirements (SOx, NOx, PM, CO2).

**Figure 6: Operational facilities (2016 vs 2018), GLE Small Scale LNG Database**




Source: GLE Small-Scale LNG Database 2018

[20] http://lngbc.eu/
[21] https://www.lngworldnews.com/lng-blue-corridors-project-ends-as-targets-reached/
[22] https://www.gie.eu/index.php/gie-publications/maps-data/gle-sslng-map

**Small scale LNG infrastructure is more developed in the regions where large-scale LNG import terminals are used.** As of June 2018, 70% of operational small-scale LNG infrastructures were located in Western Europe. Spain, United Kingdom, Norway, Netherlands and France have been driving the growth in small scale LNG infrastructure of 182% over 2016-2018.

Among the different types of infrastructure, LNG fueling stations for trucks using gas engines have witnessed the strongest growth over 2016-2018: the number of operational stations have more than doubled from 73 to 156 (Table 1).

**Table 1: Operational fuel loading road number of installations (Top 10)**

| Country | 2016 | 2018 |
|---|---|---|
| France | **1** | **21** |
| UK | **20** | **38** |
| Spain | **23** | **37** |
| Netherlands | **17** | **23** |
| Italy | **0** | **13** |
| Portugal | **2** | **9** |
| Germany | **0** | **2** |
| Sweden | **6** | **7** |
| Finland | **1** | **4** |
| Belgium | **3** | **2** |

Source: GLE Small-Scale LNG Database 2018

Experts are still analyzing the use of LNG in the rail sector. Seven planned rail loading projects have been identified. Although the technology was tested by VTG in Brunsbüttel, there is not yet a functional rail terminal as of June 2018, suggesting persistent challenges in kick-starting railroad LNG transport.

Renfe, in cooperation with Gas Natural Fenosa and Enagás, tested in January 2018 an LNG engine on the Baiña - Figaredo section of Renfe-Feve's Baiña – Collanzo, launching trials of what is claimed to be the first main line passenger train in Europe to be powered by LNG.

**GIE acknowledges the steps towards the deployment of LNG as a fuel**

GIE welcomes the EMSA guidance on LNG bunkering[23] prepared in close cooperation with the European Commission (DG MOVE), member states and industry within the context of the European Sustainable Shipping Forum. It aims to support port authorities and administrations backing the use of LNG as a ship fuel, as part of a joint effort to increase safety and sustainability.

GIE welcomes a stable regulatory framework for LNG within the internal energy market. Additionally, GIE supports the future consistency in this light.

Harmonised EU standards are needed and should be implemented at the national levels to increase interoperability among European countries. The Sustainable Transport Forum should be seen as the key instrument to steer the member states. GIE welcomes all efforts made by the policy makers in this direction.

[23] EMSA, Guidance LNG Bunkering, http://www.emsa.europa.eu/news-a-press-centre/external-news/item/3207-guidance-on-lng-bunkering-to-port-authorities-and-administrations.html

GIE also welcomes the Commission`s initiative on the alternative fuels for sustainable mobility in Europe[24]. Natural gas and bio-methane vehicles offer today a well-developed technology, with performances and cost equivalent to petrol or diesel units and with clean exhaust emissions. Natural gas use in trucks and ships can substitute diesel. Access to LNG for inland barges and maritime ships will provide a realistic option to meet challenges on lower emissions, in particular stricter sulphur emission limits in sensitive areas.

GIE acknowledges and welcomes the current existence of financial instruments, such as the Work Program for the development of Motorways of the Sea (MoS) within the Trans-European Transport Network (TEN-T) or the lending of the European Investment Bank (EIB).

**GIE policy asks – Barriers and missing actions preventing Small Scale LNG wide deployment**

**Legal/regulatory**

*Lack of environmental framework promoting switch to natural gas*

As the legal framework is improving, there is still a lack of EU environmental framework promoting the switch from oil to natural gas. The Alternative Fuels Directive (DAFI) is one the most powerful legislative instruments in the EU to spread the use of LNG as fuel.

The proper implementation of DAFI is key to facilitate the development of a single market for alternative fuels for transport in Europe. The European Commission has encouraged the development of such fuels, be it electricity, hydrogen fuel cells, natural gas etc. **GIE supports the proper implementation of DAFI as a key element of LNG uptake.** An increasing role for LNG in transportation will trigger the necessary investments in the LNG infrastructure in Europe. Small scale LNG infrastructure within the EU is developing and the utilization of the existing infrastructure is increasing, but nevertheless more facilities are necessary to offer new LNG services.

Member States were required to submit national policy frameworks for alternative fuel infrastructure by November 2017, but there is still a lack of implementation of this directive as most Member States have not met this obligation yet. According to the European Commission[25], as of November 2017, six[26] countries do not contain targets for LNG refueling points for heavy-duty vehicles along the road TEN-T Core Network. Four[27] National Policy Frameworks do not contain targets for LNG refueling points at maritime ports and three[28] do not contain targets for LNG refueling points at inland ports. A regular follow-up on the level of attainment of the national targets and objectives should be considered in order to ensure coherence at Union level.

Natural gas refueling infrastructure should be developed further to facilitate a homogeneous market throughout Europe. Harmonized EU standards are needed and should be implemented at the national levels to increase interoperability among European countries. The Sustainable Transport Forum should be seen as the key instrument to steer the member states.

[24] https://ec.europa.eu/transport/themes/urban/cpt_en
[25] European Commission, Detailed Assessment of the National Policy Frameworks, https://eur-lex.europa.eu/resource.html?uri=cellar:d80ea8e8-c559-11e7-9b01-01aa75ed71a1.0001.02/DOC_3&format=PDF
[26] Cyprus, Denmark, Ireland, Lithuania, Latvia and Sweden
[27] Cyprus, Denmark, Ireland and Sweden
[28] Czech Republic, Portugal and Sweden

*LNG in shipping*

LNG leads to specific and measurable reduction of CO2, SOx, NOx, particles and noise emissions. **GIE supports the extension of the "Sulphur Emission Control Areas" (SECA) zone to whole European coastline.** This will contribute to a lower greenhouse gas emission and prevent air and nose pollution. Effective controls on SOx and NOx would allow the wider deployment for LNG. GIE asks for the strengthening of the emissions controls and of the sanctions in case of breach and a framework ensuring that emission issues are not transferred from air to sea water.

*BioLNG*

The utilization of LNG in the maritime sector must be supported not only for the immediate contribution to air quality (PM, SOx, NOx), but also regarding CO2 emissions reductions. As reported in the "GHG Intensity of Natural Gas" study from Thinkstep, switching from HFO and MDO to LNG translates into a CO2 emissions reduction by 30% and 26% respectively on a "Tank-to-Wake[29]" perspective.

But when bioLNG is considered, combustion of renewable gas is "carbon neutral", as the CO2 generated from the combustion of the fuel is the same as converted during the lifetime of the biomass that originated the fuel.

Production of renewable gas in Europe is expected to increase: according to the roadmap document[30] jointly published by NGVA and EBA recently published a roadmap showing an increase from current 2 bcm up to 45 bcm in 2030. With a longer-term horizon, referring to 2050, Ecofys[31] foresees a potential of production in Europe around 122 bcm.

The full compatibility between natural and renewable gas is fundamental to support the energy transition towards a circular economy. Both gas infrastructure and engine technologies can use whatever blend of renewable gas, from zero up to 100% without any impact and/or additional costs.

For this reason, **it is important that the legislative measures, first, recognize when renewable gas is used in the blend and, second, support its use, highlighting the potential in reducing CO2 emissions through the closed cycle of the carbon**.

*Stable regulatory framework internal energy market*

**GIE supports a stable regulatory framework for LNG within the internal energy market.** There is no need for more regulation. LNG terminal operators are developing new services in order to promote small-scale LNG usages. We have to make sure LNG market players including terminal operators keep the flexibility to support the further development of the small-scale LNG market by developing new services and infrastructures. For more information, please have a look at the GLE LNG Service Inventory[32].

[29] The reported emissions from the different types of ships per kWh output at the wake
[30] NGVA, Driving circular economy in transport, https://www.ngva.eu/wp-content/uploads/2018/09/g-mobility_Driving-Circular-Economy-in-Transport_180830.pdf
[31] Ecofys, Gas for climate, https://www.gasforclimate2050.eu/files/files/Ecofys_Gas_for_Climate_Feb2018.pdf
[32] https://www.gie.eu/index.php/gie-publications/databases/gle-lng-services-inventory

**Financial**

In order to develop a market for alternative fuels, investments in LNG infrastructure are still necessary, as the market is just emerging. Therefore, some specific projects might need financial support if they are not carried by the market, but necessary to trigger the development of LNG infrastructure. Nevertheless, **GIE further supports the continuation of financial support for those projects in order to encourage the transition of LNG as a transportation fuel**.

In May 2018, the Commission adopted a package of measures implementing several key actions announced in its action plan on sustainable finance[33]. **GIE supports the classification of Small Scale LNG infrastructure projects as sustainable.** This would help supporting the transition to a low-carbon, more resource-efficient and sustainable economy.

**Conclusion**

Small scale LNG continues to develop as a reliable and effective solution for off-grid energy supply and as the fuel of choice for clean road and maritime transportation. The decision of the International Maritime Organization to limit sulphur content of ship fuel from 1 January 2020 to 0.5% worldwide and the recently adopted ambition to reduce GHG emission by 50% within 2050 have the potential to become game changers. There is an accelerating worldwide trend towards lower emissions of CO2, NOx and particles. Amongst other fuels, LNG is the most promising alternative fuel for shipping and road.

With the LNG fuel infrastructure in place, renewable LNG (from biomass or solar- and wind power) can gradually replace fossil LNG resulting in a fully carbon-neutral solution. LNG presents all the properties typical to top-class alternative fuel for shipping, HDV, transport, and energy production.

In order to deploy the use of LNG on a larger scale, further potential measures should be considered. The proper implementation of DAFI is a key element of LNG uptake. The extension of SECA zone to the whole European coastline with consideration of strengthening of the emissions controls and of sanctions in case of breach will be a driver for the wide use of LNG as a fuel. Further financial support to encourage the transition of LNG as a transportation fuel and the classification of Small Scale LNG infrastructure projects as sustainable will be needed. Bio LNG should be considered as part of the circular economy. A framework ensuring that emission issues are not transferred from air to sea water will be also needed.

[33] European Commission, Sustainable Finance, https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance_en

**Note to Editors**

Gas Infrastructure Europe (GIE) is an association representing the interests of European gas infrastructure operators active in natural gas transmission, storage and LNG regasification. GIE is a trusted partner of European institutions, regulatory bodies and industry stakeholders. It is based in Brussels, the heart of European policymaking. GIE currently represents 70-member companies from 26 countries. Its internal structure has three columns corresponding to the three types of infrastructure activities represented: GTE (Gas Transmission Europe), GSE (Gas Storage Europe) and GLE (Gas LNG Europe), all of which fall under the umbrella of GIE. This structure allows member companies to speak with one voice on infrastructure topics as well as to build positions on column specific issues. To find out more about GIE's structure and activities, please visit our website at www.gie.eu.

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