LNG BINNENVAART
Deployment in Inland Waterway Transport

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Breakthrough LNG Deployment in Inland Waterway Transport

4.3 Consultation of stakeholders (ship-owners) and research the market potential of LNG vessels

Survey report

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1 Introduction

LNG has the potential to improve the already strong environmental performance of the Inland Waterway Transport (IWT) sector. The successful deployment of this relatively clean fuel means an improvement of the competitiveness of IWT as compared to road transport and will result in environmental benefits as compared to the situation in which traditional fuel (diesel) is being used.

There are a couple of bottlenecks hindering the desired deployment of LNG in the IWT sector, such as financial bottlenecks. Therewith, it is far from certain how the deployment of LNG in the IWT sector will exactly take place, vessel-owners are approached and surveyed in order to determine the market potential from their point-of perspective.

2 Approach

The used approach for identifying vessel-owners' interest in applying LNG consists of 2 paths; a survey for vessel-owners in order to obtain a general view and an LNG information meeting in addition with an open discussion which provides possibility for a more in depth understanding of the vessel-owners' stance with respect to the subject. The survey consists of multiple questions with multiple answers related to sustainability in general, this study covers the intermediate results of four of the questions related to LNG. Both the survey and meeting are organized by the branch organization Koninklijke BLN-Schuttevaer.

The survey sample consists of the branch organization's members (vessel owners/operators), consisting of approximately 2200 members. The intermediate results cover 305 respondents. Prior to the LNG information meeting a needs assessment is performed in order to measure the need for such a meeting. This is performed under vessel owners with vessels potentially suited for LNG.[1] This assessment is kept under 333 members and eventually 14 of them attended the meeting.

[1] Roughly selected based on a payload of more than 2500 ton.

3 Survey

The four questions covered in this study are as follows:

1. Which sustainability topics are important to you and/or have your interest (multiple answers possible)?
   - Solar panels
   - Hybrid propulsion
   - LNG
   - New engines
   - Fuel additives
   - After-treatment
   - GTL

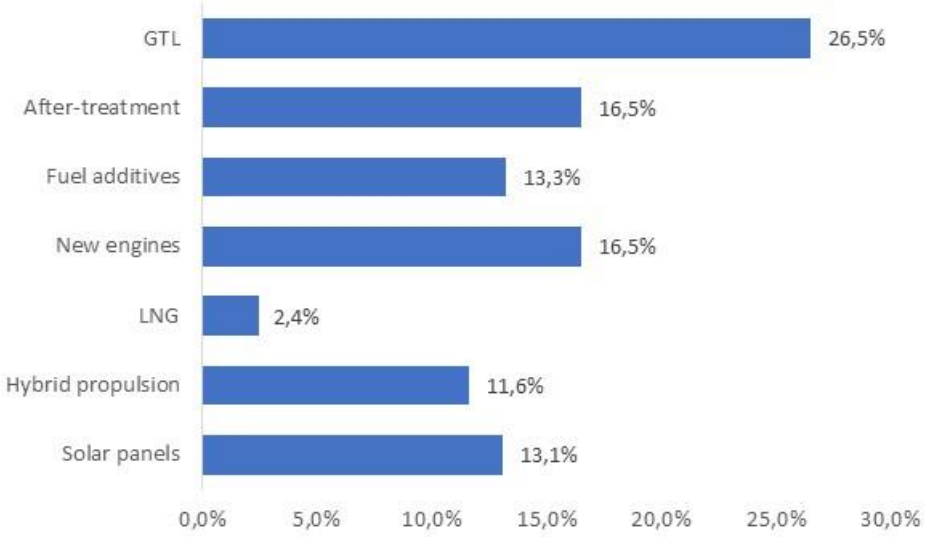
2. With which of the following alternative fuel and/or additive do you have prior experience (multiple answers possible)?
   - GTL
   - LNG
   - Hydrogen
   - Fuel additives
   - Other

3. Which emission reducing solution could be suitable for your vessel (multiple answers possible)?
   - Repowering
   - After-treatment
   - LNG
   - GTL
   - Other

4. Considering greening and sustainability, in which of the following solutions would you invest (multiple answers possible)?
   - Hybrid propulsion
   - After-treatment
   - Fuel water emulsion
   - GTL
   - LNG

Figure 1 below gives an overview of topics of interest/importance to the vessel owner. It appears that topics like Gas-To-Liquid (GTL), a synthetic liquid fuel made out of gas for diesel engines, and After-treatment techniques (e.g. catalytic converters and diesel particulate filters) are of greater interest to the respondents as compared to LNG.

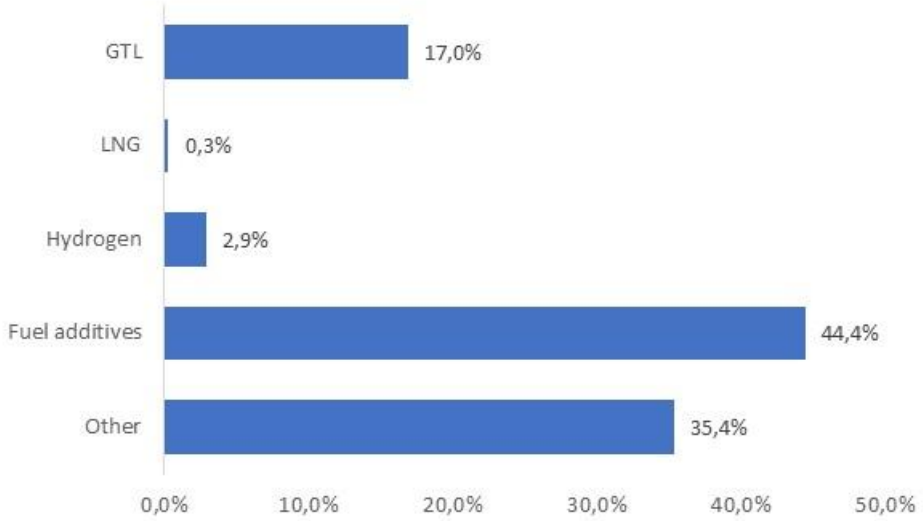
Figure 1: Topics of interest



Remark: a total of 739 answers chosen by 305 respondents

Figure 2 below illustrates the prior experience of respondents with alternative fuels and/or additives. Most respondents have prior experience with fuel additives, followed by other alternatives and GTL. Only a very small share of the respondents (0,3%) has experience with LNG, which is not remarkable though given the relatively small amount of inland vessels running on LNG.

Figure 2: Solutions with prior experience

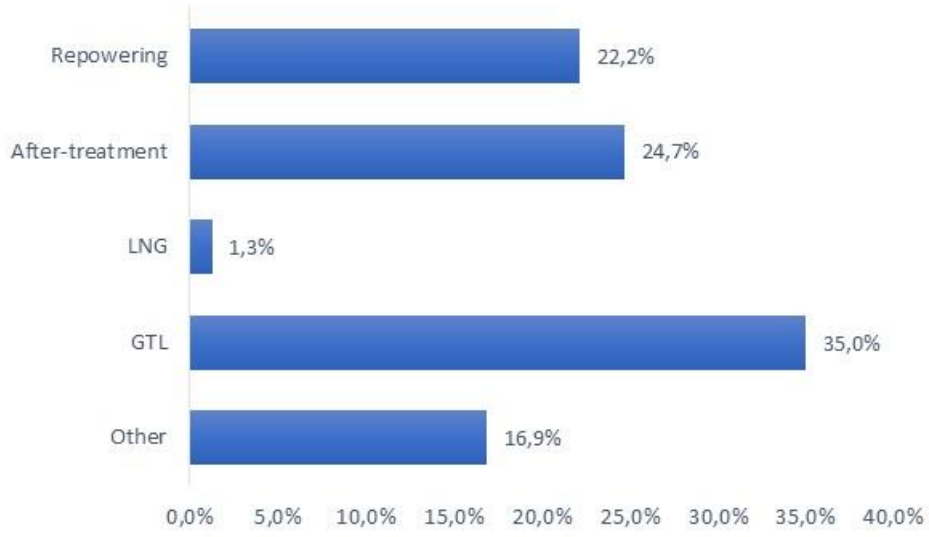


Remark: a total of 342 answers chosen by 305 respondents

Figure 3 below illustrates the results for question three. The majority of the respondents consider GTL to be the most suitable solution for their vessel. This can mainly be attributed to the fact that the use of GTL as alternative for Diesel does not require any technical adjustment to the engine at all and can be used immediately. After-treatment is the second most popular solution, after-treatment solutions like SCR's and DPF's are cost-effective solutions which may be a reason for their popularity in this sample. Repowering, or simply replacing the old engine with a new engine may also reduce emissions, unless the vessel owner chooses for a cleaner engine, and is a common practice in the sector.

A striking point is the response for LNG as compared to the alternatives, only 1,3% of the given answers indicate LNG as a suitable solution for the 'greening' of a vessel. This can be attributed to the fact that LNG requires, as opposed to GTL, a whole new LNG installation (engine, tank, etc.) on board which may not be very suitable for all type of vessels from a technical and also economic point of perspective. For example, equipping a relatively small vessel (e.g. push boat <500kW) with a relatively low annual fuel consumption with LNG, may be difficult from a technical point of perspective due to technical reasons concerning the general layout of such relative small platforms, and from an economic point of perspective due to its low annual fuel consumption.

Figure 3: Suitable solution for vessel

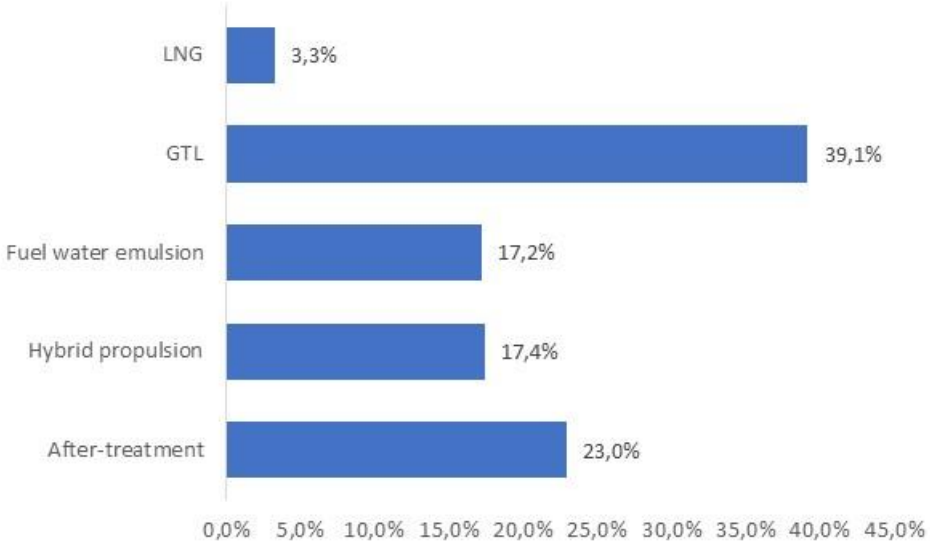


Remark: a total of 474 answers chosen by 305 respondents

Lastly, figure 4 underneath provides the results for question 4. Considering greening and sustainability, it appears that by far most respondents would invest in GTL, followed by after-treatment and hybrid propulsion. The preference for GTL can be attributed to the lack of upfront investment costs, operational costs will increase though while GTL is more expensive as compared to the conventional diesel/gasoil fuel.

The results also show that a relatively small part of the respondents would invest in LNG, which can be explained by the fact that LNG requires relatively high upfront investment costs as compared to the alternatives in figure 4. Also important is the fact that, given the current low oil price and price difference between LNG and diesel, a vessel switching from diesel to LNG needs to consume a significant volume of fuel on annual basis in order to earn the investment back (see Sub-activity 1.1 – full report for more info).

Figure 4: Investment preferences



Remark: a total of 488 answers chosen by 305 respondents

4 LNG Information Meeting

On the 24th of February 2017 an LNG information meeting was organized for 14 representatives of organizations active in IWT and operating vessels which could suited for LNG. Furthermore, stakeholders such as Shell, Engie, Pitpoint, Wärtsilä and Nationaal LNG Platform were also present. Stakeholders hold presentations and provided in-depth information about LNG in general, technical, financial and environmental related topics. The open discussion which followed provided the following in-depth understanding of vessel-owners' stance with respect to LNG.

The attendees experience mainly bottlenecks for LNG, this can partly be attributed to a lack of information or even the presence of misinformation, in turn indicating the need for a well-founded communication and dissemination of proper information towards the IWT sector. However, the experienced bottlenecks can be summarized as follows:

- It appears that vessel-owners active in IWT experience significant financial uncertainty resulting from market volatility, which makes it difficult to obtain a steady flow of cargo to transport. Moreover, commercial activities in the spot market are increasing at the expense of commercial activities in the long-term contract market. Companies active in IWT are therefore not able to engage in investments with relatively high upfront investment costs, also taking into account that many vessel-owners already have a mortgage loan for their vessel, and a long payback period of more than 10 year. Additional benefits like discounts on port dues are simply too marginal and consequently are not experienced as a drive to invest in LNG or in other green technologies.

- An LNG installation may result in a loss of cargo space in existing vessels for dry cargo (container, dry bulk), mainly due to the LNG-tank. This possible loss in cargo space reduces the payload and consequently the potential revenues, having a negative financial impact. Vessels carrying liquid bulk cargo are therefore considered to be more suitable for an LNG installation, while the LNG-tank can be placed on deck, which is not at the expense of payload. Second, a new build vessel for dry cargo can avoid this potential problem while the vessel can be designed accordingly before being built.

- Shippers of cargo usually do not pay a premium for a ‘green’ vessel, but often search for the cheapest transportation solution. Only a few multinationals pay a premium for transportation by ‘green’ vessels, which appears to be a very rare occurrence.

- It appears that the coming emission norm EU NRMM Stage V has not the necessary attention among vessel-owners and consequently does not, yet, create the necessary drive to invest in green technologies such as LNG. In addition, it also appears that the market is not fully convinced yet that LNG will meet the EU NRMM Stage V emission norm, which can in turn be related to the lack of information and/or the presence of misinformation among vessel-owners.

5 Conclusion

The survey results illustrate that LNG is not a very popular ‘greening’ solution among vessel-owners. Only a relatively small share of the survey respondents consider LNG to be suited for their vessel and would invest in it. The reluctance can in part be related to bottlenecks as experienced by vessel owners, being mainly financial bottlenecks such as:

- Significant financial uncertainty resulting from market volatility;
- High upfront investment costs for LNG and a relatively long payback period;
- Reluctance of shippers to pay a premium for transportation by ‘green’ vessels.

Next to financial bottlenecks, a ‘compliance drive’ to invest in green technologies is missing while EU NRMM Stage V has not the necessary attention among vessel-owners yet. Technical limitations also play a role, an LNG installation could result in a limited loss of cargo space in existing motor vessels for dry cargo. A last observed bottleneck is the lack of information and/or the presence of misinformation among vessel-owners which indicates the need for a well-founded communication and dissemination of proper information towards the IWT sector.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