



FINAL STUDY REPORT



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Study on the completion of an EU framework
on LNG-fuelled ships and its relevant fuel provision
infrastructure

Lot 2 “Creating Awareness on LNG Risks and Opportunities”



European Commission
Study on the completion of an EU framework on LNG-fuelled ships and its relevant fuel provision
infrastructure - LOT 2 "Creating Awareness on LNG Risks and Opportunities"

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Abstract

This report was prepared as part of the "STUDY ON THE COMPLETION OF AN EU FRAMEWORK ON LNG-FUELLED SHIPS AND ITS RELEVANT FUEL PROVISION INFRASTRUCTURE" commissioned by the European Commission, Directorate-General for Mobility and Transport (DG MOVE). The project described in this report – "Creating Awareness on LNG Risks and Opportunities" (Lot 2) – consisted of two main elements:

1. The stakeholder analysis, which was conducted by using desk research and interviews with stakeholders to understand the current stakeholder perception on opportunities and barriers regarding LNG as a shipping fuel. This stakeholder analysis served as an important input to the awareness campaign (the second element of the project).
2. The communication campaign, which consisted of a website as a central communication tool, a series of six stakeholder events (3- to -4- hour sessions presenting the project and case studies, followed by discussions), communication material (brochure, flyer), video material as well as social media activity. The project had an EU-wide scope: stakeholders from various EU countries were taken into account, the stakeholder events took place across Europe and also all other campaign activities had an EU-wide perspective. Overall the project laid a good foundation for the awareness raising of a transition to LNG as a lower-emissions fuel for the shipping industry.

Résumé

Le présent rapport a été établi dans le cadre de l'ÉTUDE RELATIVE À LA MISE EN PLACE D'UN CADRE EUROPÉEN SUR LES MÉTHANIERES ET L'INFRASTRUCTURE CONNEXE D'APPROVISIONNEMENT EN COMBUSTIBLE commandée par la Direction générale de la mobilité et des transports (DG MOVE) de la Commission européenne. Le projet décrit dans ce rapport, Sensibilisation aux risques et aux possibilités offertes par le GNL (lot 2), est constitué de deux éléments principaux:

1. L'enquête sur les parties prenantes, fondée à la fois sur de la recherche documentaire et des entretiens avec les parties concernées, visant à comprendre ce qu'elles pensent actuellement des opportunités et des obstacles liés au GNL comme combustible pour les navires. L'enquête sur les parties prenantes a beaucoup contribué à la campagne de sensibilisation (le deuxième élément du projet).
2. La campagne de communication constituée d'un site Internet comme outil de communication principal, d'une série de six événements pour les parties prenantes (sessions de 3-4 heures présentant le projet et des études de cas, suivies de discussions), de matériel de communication (brochure, dépliants), de matériel vidéo ainsi que d'une activité sur les médias sociaux. Le projet s'étendait à toute l'Union européenne: les parties concernées étaient issues de différents pays de l'UE, les événements destinés aux parties prenantes ont eu lieu dans différents pays d'Europe et les autres activités de la campagne étaient également à échelle de l'UE. De façon générale, le projet offre une base pour soutenir la transition vers le GNL dans le secteur maritime, comme combustible dégageant peu d'émissions.

1. Executive summary: Analysis as the basis for the awareness campaign

Background note

This report was prepared as part of the "STUDY ON THE COMPLETION OF AN EU FRAMEWORK ON LNG-FUELLED SHIPS AND ITS RELEVANT FUEL PROVISION INFRASTRUCTURE" commissioned by the European Commission, Directorate-General for Mobility and Transport (DG MOVE). The purpose of the project described in this report – "Creating Awareness on LNG Risks and Opportunities" (Lot 2) – was to develop an understanding of the current stakeholder perception on opportunities and barriers regarding LNG as a shipping fuel by main stakeholder groups and to create an awareness campaign on this subject matter. The specific objectives of this study were, in particular, to

- provide a general overview of risks and opportunities regarding the storage, provision and use of LNG as a marine fuel for shipping,
- identify the reasons behind the negative public perception of the dangers of using LNG as a fuel for ships and propose adequate policy measures, and
- develop informative materials on LNG in close cooperation with all stakeholders concerned.

Furthermore, it was also expected to develop two tailor-made awareness campaign concepts in order to effectively address the identified issues focusing on the

- EU-wide public and
- target-group/industry specific audiences (including national governments).

Contrary to the initial tender specifications and project planning, it was agreed that the current project set-up (and campaign budget) could not realistically reach the general public within the European Union. It was agreed that there would not be a separate public campaign. Some elements of the campaign (e.g. the website and information material offered on the website) are relevant to the public, but the general public would not be addressed as a particular target group. Furthermore, selected NGOs and public authorities (partially representing the public opinion) were invited to the stakeholder events.

The campaign consisted of a website as central communication tool, a series of six stakeholder events (3- to 4-hour sessions presenting the project and case studies), communication material (brochure, flyer), video material as well as social media activity.

The project had an EU-wide scope: stakeholders from various EU countries were taken into account, the stakeholder events took place across Europe and also all other campaign activities had an EU-wide perspective.

The project described in this report – Lot 2 – strongly cooperated with Lot 1 "Analysis and evaluation of identified gaps and of the remaining aspects for completing an EU-wide framework for marine LNG distribution, bunkering and use". Much of the technical input, particularly on the standards and regulations as well as the safety aspect of LNG, was delivered by Lot 1.

Target groups

- The purpose of the stakeholder analysis was to get an up-to-date understanding of how the different stakeholders view LNG as a shipping fuel. The stakeholder analysis gave valuable input to the awareness campaign.
- The stakeholder analysis took a broad view on all relevant stakeholders including:
 - Government and policy makers (including representatives of EU Member States responsible for shipping)
 - Local maritime transport authorities in the EU Member States, municipalities in coastal areas
 - Port authorities
 - Research institutions
 - Classification societies
 - NGOs, including environmental organizations
 - Shipbuilders
 - Gas suppliers
 - Terminal operators
 - Service suppliers
 - Industry associations, especially (but not exclusively) in the areas of shipping, gas, energy infrastructure, ports
 - Investors and financial institutions

Stakeholder interviews conducted from November 2014 to January 2015

- 56 responses from stakeholders in the maritime sector were recorded via an online questionnaire, of which 44 responses were conducted via personal interview (either in person (37%), by telephone (61%) or via video conference (2%)).
- The interviews were well balanced across Europe: we received responses from stakeholders in countries with strong "LNG as a fuel"-activities (e.g. Netherlands, Belgium, Denmark) but also from Greece (strong interest in the topic) and various other countries (e.g. Spain, Latvia, Turkey, Norway, United Kingdom).
- For the study we also contacted 36 European and international non-governmental organizations (NGOs) and municipalities which have a direct affiliation with LNG infrastructure. We have conducted interviews with 5 organizations. The response to our stakeholder analysis among NGOs and municipalities was below our expectations (many of the organizations we contacted did not respond or refused participation; we assume that this is due to a lack of involvement with LNG as a shipping fuel at this point in time).

Summary of impressions from the stakeholder interviews

- a) General overview of risks and opportunities regarding storage, provision and use of LNG as a marine fuel – key findings
 - The compliance with ECA zone requirements and the related positive environmental effect are the major motivation for stakeholders to consider or to engage in LNG as a shipping fuel.
 - Financing of LNG as a fuel and the pricing of LNG are among the most critical issues for a further deployment. For many companies, especially shipping companies, LNG does not offer a profitable business model yet: the higher equipment (engine and tank) costs are not offset by savings in fuel or operating expenses.

- b) Reasons behind the negative public perception of the dangers of using LNG as a fuel for ships– key findings
 - The lack of a complete harmonized set of standards and regulations is perceived as an issue but the overall conviction is that the industry is on a good way and that this would not be a major barrier in the future.
 - The "chicken-and-egg problem" (stakeholders pointing at each other to make the first step) remains – it can only be overcome by initiating and implementing local or point-to-point consortia between shipping lines, gas suppliers and other relevant stakeholders.

Outcome of the stakeholder analysis for the campaign

- The stakeholder analysis confirmed the need to further increase awareness around LNG for shipping among most stakeholder groups.
- From the experience of previous awareness campaigns we proposed a segmentation of the stakeholders by the level of support for LNG as a fuel: in decreasing order of support level the segments are "Supporters", "Proponents", "Neutralists" and "Adversaries".
- The stakeholder groups identified in the course of this project have been allocated to the four segments. The campaign instruments and the communication content were varied along the lines of the defined segments (e.g. slightly different focus of the events, individual sections on the website).

Campaign concept developed and fully implemented

- The overall objectives of the campaign were to increase the knowledge and awareness about LNG as a fuel and to spark discussion and networking effects regarding LNG as a fuel.
- The main instruments of the campaign were: campaign website, stakeholder events, an information brochure, a flyer, videos, press releases and social media activities.

- Campaign website: a website (www.lngforshipping.eu) as a central communication tool has been developed that combines all relevant information on LNG as a shipping fuel. Besides a general introduction there are special sections on different target groups (shipping companies, gas companies, public authorities).
- Stakeholder events: six events were organized and hosted in the course of this project:
 - A kick-off event in Brussels, organized in cooperation with Lot 1
 - An event focusing on financing LNG for shipping in London
 - An event in Hamburg as a side event to the World Ports Conference
 - An event in Piraeus/Athens during European Maritime Day
 - A round-table discussion as a session on a commercial LNG conference in Amsterdam
 - A closing event in Brussels was held involving also Lots 1 and 3 of the overall program

At least 340 people were reached directly by the events, many more were reached by our communication activities (invitations, PR activities)

- Brochure: a 16-page brochure was created to give a more detailed introduction to LNG as a shipping fuel. Flyer: a 2-page flyer in A4 format was developed and printed. It was used as a printout during the events and as a PDF file in most of the communication regarding our campaign.
- Videos: a main video (in three versions of different lengths) and 10–12 shorter Q&A snippets are available on the website.
- Press releases/PR activities: different press releases covering the different events were created and distributed.
- Social media/Twitter activity: various tweets (mainly by DG MOVE) helped to spread the word about the campaign in social media. The social media activities had a positive effect on the awareness on LNG as a fuel and on the campaign itself, especially during the events. For example on Twitter, 107 tweets could be assigned to 56 users related to the campaign LNG for Shipping.

All information materials are available for further use by stakeholders (authorized reproduction) provided the source is acknowledged.

Continuous campaign monitoring to prove impact of the campaign

For all campaign elements, strict monitoring was executed to ensure the achievement of the desired outcomes. A high-level methodology such as the Barcelona principles by AMEC¹ and specific performance metrics were used to measure the effectiveness of the campaign.

Our analysis indicates that the site traffic slowly increased since the official launch of the website. During the campaign period the website counted a minimum of 150 sessions and a minimum of 100 users per week. Moreover, a higher number of positive posts (11%) versus negative ones (3%) around the topic LNG is observed in social

¹ International Association for Measurement and Evaluation of Communications

media. The initiated press releases were successfully spread in traditional and new media in more than 35 platforms among 5 local markets (Belgium, Netherlands, Norway, Greece, and UK).

Furthermore, a strong participation in the stakeholder events and a broad variety in terms of participants' countries of origin was identified. The majority of participants who completed our feedback survey rated the content and the discussions of the events "excellent" or "good".

Conclusion and next steps

The campaign elements – especially the website, flyer, brochure and the videos – can be used by the European Commission services and other interested parties to further communicate on the topic. During all events we made the offer to the participants to use the materials we created for further communication activities on a national and regional level. On request, all source files for printed materials can be provided in order to enable local language versions or special-purpose versions of the documents we created.

The use of LNG as a shipping fuel is increasing and therefore the need for information from all stakeholders will continue to rise. As the overall feedback to the campaign was positive, it is clearly recommended to continue the activities that have been initiated by this project.

2. Synthèse: enquête à la base de la campagne de sensibilisation

Note préliminaire

Le présent rapport fait partie de J'ÉTUDE RELATIVE À LA MISE EN PLACE D'UN CADRE EUROPÉEN SUR LES METHANIERES ET L'INFRASTRUCTURE Connexe d'approvisionnement en combustible commandée par la Direction générale de la mobilité et des transports (DG MOVE) de la Commission européenne. L'objectif du projet décrit dans ce rapport – Sensibilisation aux risques et aux possibilités offertes par le GNL (lot 2) – était de comprendre comment les parties prenantes percevaient actuellement les possibilités et les obstacles concernant l'utilisation du GNL comme combustible à usage maritime parmi les principaux groupes d'intervenants et de lancer une campagne de sensibilisation à ce sujet. Les objectifs spécifiques de cette étude étaient en particulier de:

- fournir un aperçu général des risques et des perspectives concernant le stockage, l'approvisionnement et l'utilisation de GNL en tant que combustible pour la navigation
- identifier les raisons de la perception négative par le public des dangers de l'utilisation de GNL en tant que combustible pour les navires et proposer des mesures adaptées
- développer du matériel d'information sur le GNL, en étroite collaboration avec les parties concernées.

En outre, il était également prévu de mettre au point deux concepts de campagne de sensibilisation sur mesure, afin de traiter de manière efficace les problèmes identifiés, en se concentrant sur:

- le public de l'UE
- les groupes cibles/spécifiques au secteur (y compris les gouvernements nationaux).

Contrairement à ce que prévoyait le cahier des charges initial et la planification du projet, on a constaté qu'il était irréaliste que le projet actuel (et le budget de la campagne) touche le grand public de l'Union européenne. Il a donc été convenu qu'il n'y aurait pas de campagne publique séparée. Certains éléments de la campagne (le site Internet et le matériel d'information fourni sur le site, par exemple) sont pertinents pour le grand public, mais ce dernier ne sera pas visé comme un groupe cible particulier. De plus, des ONG et organismes publics (représentant partiellement l'opinion publique) ont été invités aux événements destinés aux parties prenantes.

La campagne s'appuyait sur un site Internet comme outil de communication central, sur une série de six événements réunissant les acteurs concernés (sessions de 3-4 heures présentant le projet et des études de cas), sur des supports de communication (brochure, dépliants), du matériel vidéo et une activité sur les médias sociaux.

Le projet avait une envergure européenne: les parties concernées de divers pays de l'Union ont été prises en compte, les événements réunissant les parties prenantes se sont déroulés dans toute l'Europe et toutes les autres activités liées à la campagne avaient une perspective européenne.

Le projet décrit dans ce rapport – lot 2 – a été mené en lien étroit avec le lot 1, Analyse et évaluation des lacunes identifiées ainsi que des autres aspects en vue de l'achèvement d'un cadre de l'UE pour la distribution, l'avitaillement et l'utilisation de GNL marin. La plupart des données techniques sur le GNL, notamment en ce qui concerne les normes et réglementations, ainsi que les éléments relatifs à la sécurité, ont été fournies par le lot 1.

Groupes cibles

- L'objectif de l'enquête sur les parties prenantes était de comprendre le point de vue des différents acteurs sur le GNL en tant que combustible pour les navires. L'analyse a fourni des informations précieuses pour la campagne de sensibilisation.
- L'enquête a englobé largement toutes les parties prenantes pertinentes:
 - États et responsables politiques (dont des représentants des États membres responsables du transport maritime)
 - Autorités locales chargées du transport maritime dans les pays membres de l'UE, municipalités des zones côtières
 - Autorités portuaires
 - Instituts de recherche
 - Sociétés de classification
 - ONG, dont organisations environnementales
 - Constructeurs de navires
 - Fournisseurs de gaz
 - Exploitants de terminaux
 - Prestataires de services
 - Associations du secteur, notamment (mais pas exclusivement) dans les domaines du transport maritime, du gaz, des infrastructures énergétiques et des activités portuaires
 - Investisseurs et institutions financières

Nombre significatif d'entretiens avec les parties prenantes menés de novembre 2014 à janvier 2015

- 56 réponses de parties prenantes dans le secteur maritime ont été enregistrées grâce à un questionnaire en ligne. 44 de ces réponses avaient été obtenues lors d'un entretien personnel, que ce soit en personne (37%), par téléphone (61 %) ou par vidéo-conférence (2 %).
- Les entretiens étaient bien répartis en Europe: nous avons reçu des réponses d'acteurs opérant dans des pays où les activités liées au GNL comme combustible sont déjà très développées (par exemple: Pays-Bas, Belgique, Danemark), mais aussi de Grèce, en raison d'un grand intérêt pour le sujet, et de divers autres pays comme l'Espagne, la Lettonie, la Turquie, la Norvège, le Royaume-Uni.
- Pour cette étude, nous avons également contacté 36 organisations non gouvernementales européennes et internationales et des municipalités qui sont directement concernées par les infrastructures destinées au GNL. Nous avons mené des entretiens avec 5 organisations. Le taux de réponse à notre enquête parmi les ONG et les municipalités était inférieur à nos attentes (nombre

d'organisations que nous avons contactées n'ont pas répondu ou ont refusé de participer ; nous supposons que cela est dû à un faible intérêt pour le GNL en tant que combustible marin à ce stade).

Résumé des impressions dégagées des entretiens avec les parties prenantes

- a) Aperçu général des risques et des possibilités concernant le stockage, l'approvisionnement et l'utilisation de GNL en tant que combustible pour les navires – principales conclusions
 - La conformité avec les exigences des zones de contrôle des émissions (ECA) et les effets positifs pour l'environnement qui y sont liés constituent la principale raison qui incite les parties prenantes à se lancer dans le GNL en tant que combustible pour les navires, ou à l'envisager.
 - Le financement du GNL comme combustible et sa tarification font partie des points les plus critiques pour un développement futur. Pour beaucoup d'entreprises, notamment les compagnies de transport maritime, le GNL n'offre pas encore un modèle économique rentable: les coûts élevés d'équipement (moteur et réservoir) ne sont pas compensés par les économies en carburant ou en charges d'exploitation.

- b) Raisons de la perception négative par le public des dangers de l'utilisation de GNL en tant que combustible pour les navires – principales conclusions
 - L'absence d'un ensemble cohérent de normes et de réglementations est perçue comme un problème, mais la conviction générale est que le secteur est en bonne voie et qu'il n'y aura pas d'obstacle majeur à l'avenir.
 - Le problème des acteurs qui se renvoient la balle, attendant que les autres fassent le premier pas, demeure – il ne peut être surmonté qu'en initiant et en mettant en place des consortiums locaux ou au cas par cas entre les compagnies maritimes, les fournisseurs de gaz et les autres acteurs concernés.

Conséquences de l'enquête auprès des parties prenantes pour la campagne

- L'enquête a confirmé la nécessité de mieux faire connaître le GNL pour le transport maritime dans la plupart des groupes d'acteurs.
- Sur la base de notre expérience des campagnes de sensibilisation précédentes, nous avons proposé de distinguer quatre catégories parmi les parties prenantes, selon leur degré de soutien au GNL en tant que combustible: dans l'ordre décroissant, il s'agit des « partisans », « sympathisants », « neutres » et « adversaires ».
- Chaque groupe d'acteur identifié au cours du projet a été réparti dans une des quatre catégories. Les instruments de la campagne et le contenu de la communication ont plus ou moins varié en fonction de la catégorie concernée (par exemple: événements pensés légèrement différemment, rubriques séparées sur le site Internet).

Concept de campagne mis au point et appliqué en totalité

- Les objectifs généraux de la campagne sont d'informer et de sensibiliser au sujet du GNL en tant que combustible, d'ouvrir le débat et d'encourager le réseautage autour de ce thème.
- Les principaux instruments de la campagne sont: un site Internet, des événements réunissant les parties prenantes, une brochure informative, un dépliant, des vidéos, des communiqués de presse et des activités sur les médias sociaux.
- Site de campagne: un site Internet (www.lngforshipping.eu) sert d'outil central de communication et rassemble toutes les informations pertinentes sur le GNL en tant que combustible pour la navigation. Outre une introduction générale, il comprend des rubriques spécifiques sur les différents groupes cibles (compagnies maritimes, entreprises du secteur énergétique, pouvoirs publics).
- Évènements pour les parties prenantes: six évènements ont été organisés au cours du projet:
 - Un évènement de lancement à Bruxelles, organisé conjointement avec le lot 1
 - Un évènement axé sur le financement du GNL pour le transport maritime à Londres
 - Un évènement à Hambourg, en tant que manifestation en marge de la World Ports Conference
 - Un évènement au Pirée, à Athènes, pendant la Journée européenne de la mer
 - Une table ronde dans le cadre d'une conférence commerciale sur le GNL à Amsterdam
 - Un évènement de clôture à Bruxelles, concernant également les lots 1 et 3 du programme général

Au moins 340 personnes ont été touchées directement par ces évènements, et bien plus l'ont été par les activités de communication (invitations, activités de relations publiques).

- Brochure: une brochure de 16 pages a été créée pour proposer une introduction plus détaillée au sujet du GNL comme combustible pour la navigation. La brochure est actuellement en phase finale de révision.
- Dépliant: un dépliant de 2 pages au format A4 a été conçu et imprimé. Il a été utilisé sous sa forme papier pendant les évènements et en document PDF dans la plupart des opérations de communications de notre campagne.
- Vidéos: une vidéo principale (en trois versions de longueurs différentes) et 10 – 12 petits extraits correspondants à des questions-réponses sont disponibles sur le site Internet.
- Communiqués de presse/activités RP: rédaction et distribution de différents communiqués de presse couvrant les divers évènements.
- Médias sociaux/Twitter: les nombreux tweets (principalement de la DG MOVE) ont aidé à faire passer le message concernant la campagne dans les médias sociaux. Les activités s'appuyant sur les médias sociaux ont eu des effets positifs sur la sensibilisation au GNL en tant que combustible et sur la campagne elle-même.

Tout le matériel d'information est disponible pour être réutilisé par les parties prenantes (reproduction autorisée), à condition de mentionner la source.

Suivi continu de la campagne pour valider son impact

Pour tous les éléments de la campagne, nous avons effectué un suivi strict afin d'obtenir les résultats voulus. Une méthodologie de qualité s'appuyant sur les principes édictés à Barcelone par l'AMEC² et des indicateurs spécifiques de performance ont été utilisés pour mesurer l'efficacité de la campagne.

Notre analyse indique que le nombre de visites du site Internet a bien augmenté depuis son lancement officiel. De plus, on observe un nombre plus élevé de messages positifs (11 %) que de messages négatifs (3 %) au sujet du GNL sur les médias sociaux. Les communiqués de presse ont été repris avec succès dans les médias traditionnels et les nouveaux médias, sur plus de 35 plateformes, sur 5 marchés locaux (Belgique, Pays-Bas, Norvège, Grèce, et RU).

En outre, on a constaté une forte participation aux événements destinés aux parties prenantes et une grande variété des pays d'origine des participants. Beaucoup d'entre eux ont rempli notre questionnaire de satisfaction et évalué le contenu et les débats des événements comme « excellents » ou « bons ».

Conclusion et prochaines étapes

Les éléments de la campagne – notamment le site Internet, le dépliant, la brochure et les vidéos – peuvent être utilisés par les services de la Commission européenne et par les autres parties intéressées pour continuer à communiquer sur le sujet. Pendant chaque événement, nous avons proposé aux participants de se servir des supports que nous avons créés pour communiquer ensuite aux niveaux national et régional. Tous les fichiers sources des documents imprimés peuvent être fournis sur demande, afin de permettre leur traduction ou leur utilisation à des fins spécifiques.

Le recours au GNL comme combustible pour la navigation est en expansion; l'ensemble des parties concernées aura donc de plus en plus besoin d'informations. Les retours sur la campagne étant dans l'ensemble positifs, il est clairement recommandé de poursuivre les activités initiées par ce projet.

² International Association for Measurement and Evaluation of Communications (Association internationale pour la mesure et l'évaluation des communications)

3. Combined approach to Phase 1 and Phase 2 (Methodology)

In this chapter, we describe how Phases 1 and 2 were approached. The results provide key insights that form the basis for Phase 3 – the communication campaign.

3.1. Objective of Phase 1 and Phase 2

The combined objective of Phases 1 and 2 was to lay the necessary groundwork for the communication campaign, as shown in figure 1. The findings of Phases 1 and 2 form the basis to define a communication strategy, campaign concepts and resulting communication plan – the subject of Phase 3.



Figure 1 – Phase 1 and Phase 2 methodology

3.2. Approach of Phase 1 and Phase 2

Phases 1 and 2 were approached in combination as they interdependent substantially on each other.

As part of **Phase 1 – Research and Expert Consultation** we developed an overview of barriers³ and opportunities regarding LNG as a shipping fuel based on the analysis of conducted studies and publications concerning LNG as a shipping fuel.

³ 'Barriers' is defined as gaps in legislation, harmonization, technology and knowledge as well as risk- and safety-related barriers.

Some key studies and publications⁴ used in Phase 1 were the following:

- *Outlook: Global LNG*. Eurasia Group, July 2014
- Honoré, Anouk. *The Outlook for Natural Gas Demand in Europe*. The Oxford Institute for Energy Studies, June 2014.
- Langfeldt, Lars. Final Report European Maritime Safety Agency (EMSA) – Study on Standards and Rules for Bunkering of Gas-Fuelled Ships. Germanischer Lloyd, Feb. 2014
- Lowell, Dana. Assessment of the Fuel Cycle Impact of Liquefied Natural Gas as Used in International Shipping. The International Council on Clean Transportation, May 2013.
- LNG – Straight Ahead to Safe LNG Bunker Supply. Germanischer Lloyd, Feb. 2013
- Ship Efficiency & Emission Reduction – Leading the way to more efficient and cleaner sea transport. Germanischer Lloyd, Jan. 2013
- Costs and Benefits of LNG as Ship Fuel for Container Vessels. Germanischer Lloyd, MAN Turbo & Diesel, 2011
- Dr Melhem, G. A., Dr Kalelkar, A. S., Dr Saraf, S., Ozog, Henry, *Managing LNG Risks: Separating the Facts from the Myths*. ioMosaic Corporation, Aug. 2006
- *Liquefied Natural Gas: Understanding the Basic Facts*. Department of Energy, National Association of Regulatory Utility Commissioners, Aug. 2005
- Lloyds List: Insights into the commercial growth of LNG as a marine fuel.
- North European LNG Infrastructure Project – A feasibility study for an LNG filling station infra-structure and test of recommendations, The Danish Maritime Authority, Copenhagen, March 2012

Following the desktop study, we conducted consultation with selected industry experts from the extensive PwC and DNV-GL network. The draft overview of opportunities and barriers for LNG as a fuel for shipping resulting from the desktop study was refined by these additional insights from our industry expert.

Furthermore, as part of **Phase 1 – Input Lot 1**⁵ we also drew upon the findings of Lot 1 such as a preliminary analysis of gaps and barriers for LNG as a shipping fuel, some conclusions on specific technical, safety and security related risks and the overview of current, planned and proposed policy measures.

As a result, we created a preliminary overview of opportunities and barriers as can be seen in figure 2, which was used primarily as a basis for the online questionnaire and the stakeholder interviews.

⁴ The following list of studies and publications are the most important

⁵ LOT 1 of the STUDY ON THE COMPLETION OF AN EU FRAMEWORK ON LNG-FUELLED SHIPS AND ITS RELEVANT FUEL PROVISION INFRASTRUCTURE: Analysis and evaluation of identified gaps and of the remaining aspects for completing an EU-wide framework for marine LNG distribution, bunkering and use

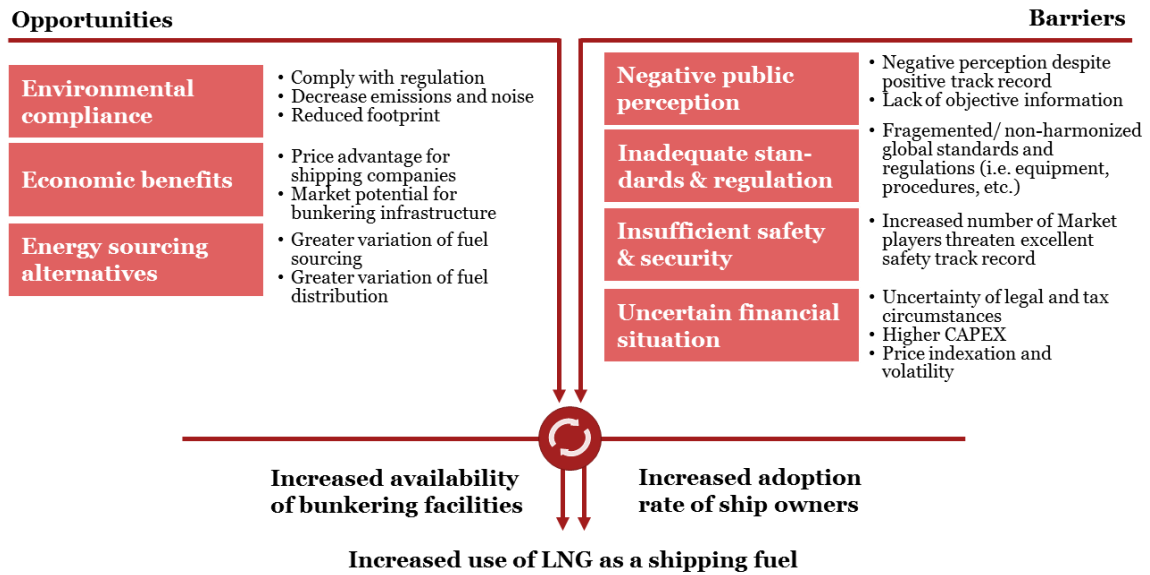


Figure 2 – Overview of opportunities and barriers

We developed an understanding of the perceptions of the public⁶, industrial and other stakeholders on the opportunities and barriers of LNG as a shipping fuel. We developed this by conducting an online questionnaire as well as personal interviews with selected stakeholders. The majority of the interviews were recorded as an online response (via the questionnaire).

As part of **Phase 2 – Focus Interviews** we consolidated stakeholder contacts from the PwC, DNV-GL and MSLGROUP networks and 46 of these contacts participated in personal interviews. Industry professionals were clustered into industry segments or groups, who are either actively or passively involved in the usage of LNG as a shipping fuel. In order to achieve a truly holistic understanding of stakeholders' perception we sought to consider a broad range, consisting of six specific groups, as can be seen in figure 3, focusing on categorical and geographical representativeness.

⁶ In the kick-off meeting on October 22, 2014, it was agreed that there would not be separate market research for the "general public". As a proxy for the general public, we conducted interviews with NGOs, public authorities and municipalities. The same principle was applied to the communication campaign.

Stakeholder Groups	Stakeholders
PUBLIC STAKEHOLDERS	
<i>General Public</i>	Local authorities
<i>NGOs</i>	Environmental organizations and other NGOs
INDUSTRY- AND OTHER STAKEHOLDERS	
<i>Authorities</i>	Government and policy makers
	Maritime transport authorities of the EU member states
	Industry associations
<i>Industry</i>	Ship owners and managers
	Service suppliers, including bunkering services provision
	Gas suppliers
	Port authorities
	Terminal operators
	Shipbuilders and maritime equipment
	Investors and financial institutions
	Classification societies
<i>Research and education</i>	Universities/technical educators and research institutions
<i>Other</i>	Consulting firms

Figure 3 – Stakeholder clustering

Simultaneously, we developed a questionnaire as part of **Phase 2 – Online Questionnaire** on the basis of the Phase 1 results. The questionnaire was structured so that the perception of the broad range of stakeholders on LNG as a shipping fuel could be captured. The questionnaire broadly consisted of four parts:

1. General knowledge, attitude and behaviour towards LNG as a shipping fuel
2. Opportunities and barriers regarding LNG as a shipping fuel
3. Media preferences
4. Profile of survey respondents

Consequently, we launched the online questionnaire, which is included in Appendix 8.1, and started conducting several personal interviews via face-to-face meetings and telephone/video conferences with selected stakeholders. Of the 56 recorded responses via the online questionnaire, 44 responses were gathered via a personal interview. The information about the campaign and the link to the online questionnaire was widely shared among the stakeholders. As the information and link were shared by different people from the three partners of the project consortium (DNV-GL, MSLGROUP and PwC) and were then again re-sent by stakeholders it is not possible to quantify the number of people who received the information about the questionnaire. We expect it to be around 100-150.

All figures and conclusions mentioned in the context of the stakeholder interviews and online questionnaire were based on the responses we received until May 14, 2015. The questions we asked our respondents in the personal interviews and in the online questionnaire were identical.

Appendix 8.2 features the list of the 56 organizations which have participated in this survey.

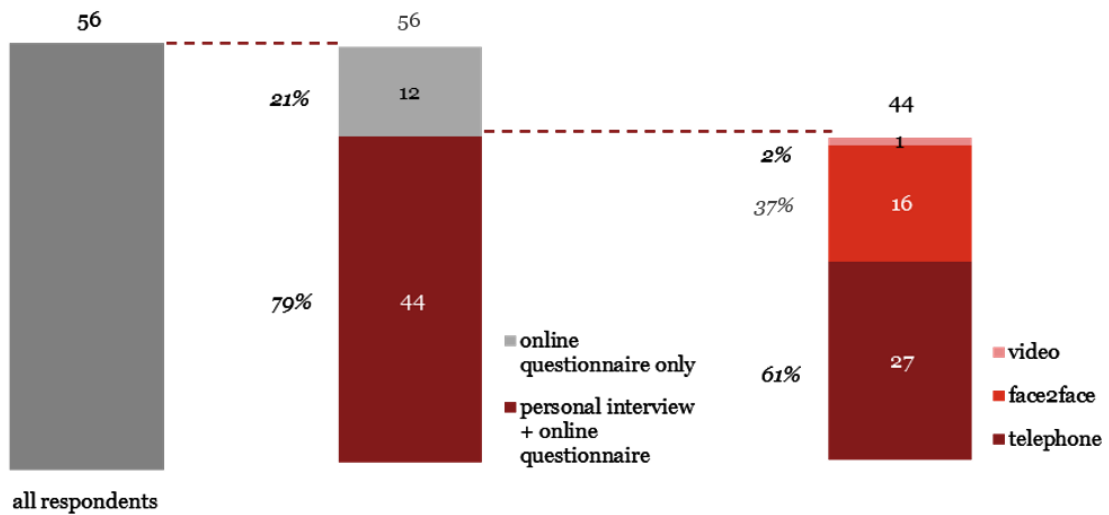


Figure 4 – Study responses by type

About one-third of the personal interviews were conducted face-to-face. The meetings took between 1 and 1.5 hours per interview and assisted in uncovering the strategic direction of the organization and identified their main perceived opportunities and concerns about LNG as a shipping fuel. The meetings were conducted in the main shipping hubs and geographically spread.

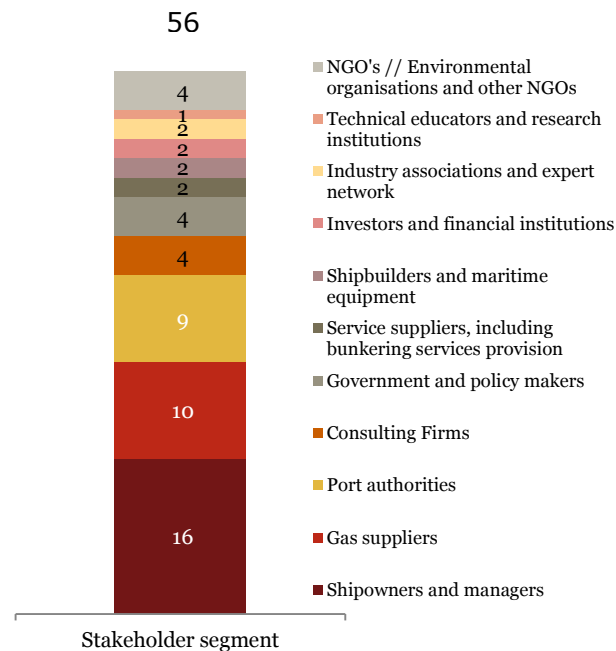


Figure 5 – Study responses by stakeholder segment and geographical region

The stakeholder analysis generally took a broad view on all relevant stakeholders – among others the shipping industry, the gas industry, the equipment manufacturers and port authorities. The stakeholder groups were categorized into 10 segments:

- Shipowners and managers, e.g. DFDS, Flinter Management, TernTank
- Gas suppliers, e.g. BP, E.ON Ruhrgas, Shell
- Port authorities, e.g. Port of Hamburg, Freeport of Riga Authority
- Consulting Firms, e.g. DNV-GL, Linde AG, K&L Gates
- Government and policy makers, e.g. DMA, SEWCU
- Service suppliers, including bunkering services provision, e.g. Bomin Linde, Aegean Bunkering Services
- Shipbuilders and maritime equipment, e.g. Damen Shipyards, MAN Turbo & Diesel
- Investors and financial institutions, e.g. HVB, Unicredit
- Industry associations and expert networks, e.g. BLN, Royal Belgian Shipowners Associations
- Technical educators and research institutions, e.g. TNO
- NGOs/environmental organizations and other, e.g. NABU, WWF

It was important to have a relatively good balance between different European countries, which is shown in the following figure.

Total number of respondents: 56

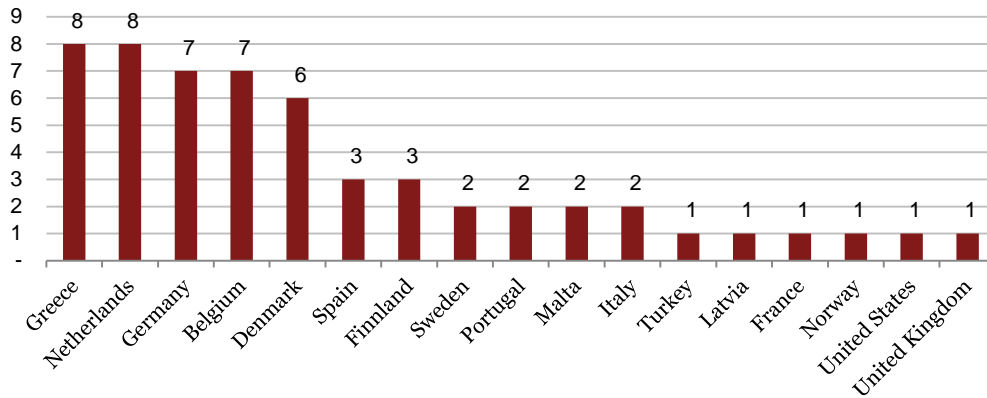


Figure 6 – Geographical location of respondents

It shows that Greece is very well represented because we received a very good feedback to our requests. The high response quote shows a high level of interest in LNG as a fuel although there are still relatively few actual installations and vessels active in this country. The Netherlands, Belgium, Germany and Denmark are also well represented in our survey because these countries are already very active in the field of LNG for shipping.

The purpose of the stakeholder analysis was to get an up-to-date understanding of how the different stakeholders view LNG as a shipping fuel. The stakeholder analysis gave valuable input to the awareness campaign.

After the industry stakeholders interviews were completed, public organizations/NGOs were addressed with the same questionnaire. These were addressed in sequence to the stakeholders so that the interviews could take place in a very balanced and informed manner. The final analysis includes all interview results.

Based on the online survey and the personal interviews we analysed the views and positions regarding LNG as a shipping fuel, identifying the reasons underlying the current perception and furthermore deriving focus areas for potential policy measures. The questionnaire used can be found in Appendix 8.1. The results are presented in chapter 4 of this report.

4. Stakeholder analysis provides important input to the communication campaign

4.1. Introduction

The stakeholder analysis described in this chapter assisted in the development of the tailored communication campaigns towards the targeted groups. As described in chapter 3.2, stakeholders were asked to participate in the online survey (even if a personal/video interview was conducted), enabling us to draw quantitative conclusions from the survey responses – these are described as survey respondents in the following chapter. Additionally selected stakeholders were asked to participate in personal interviews to elaborate their opinions, enabling us to increase the quantitative analysis with qualitative information.

4.2. General knowledge, attitude and behaviour regarding LNG

Most respondents to the survey are generally knowledgeable about LNG for shipping. However, there were still differences in terms of level of knowledge and behaviour towards specific aspects of LNG. The least familiar aspects were related to economic and regulatory aspects. The majority of the survey respondents actively contribute new knowledge regarding LNG, whereby the smallest contribution relates to regulatory and economic aspects. Other aspects mentioned by the survey respondents were related to technological development, elimination of particle matter emissions, chartering strategy, the availability of bunkers and cleanliness of the fuel.

Gas suppliers are a group of industry professionals who are very familiar with LNG and related topics. They are relatively more knowledgeable and contribute more often new knowledge about economics, technology and infrastructure related to LNG than shipowners. Regulation is an aspect where gas suppliers provide less new knowledge.

Another finding was that the knowledge level and familiarity with LNG among shipowners differ; the majority is relatively more familiar with technological and infrastructural aspects than with regulatory aspects.

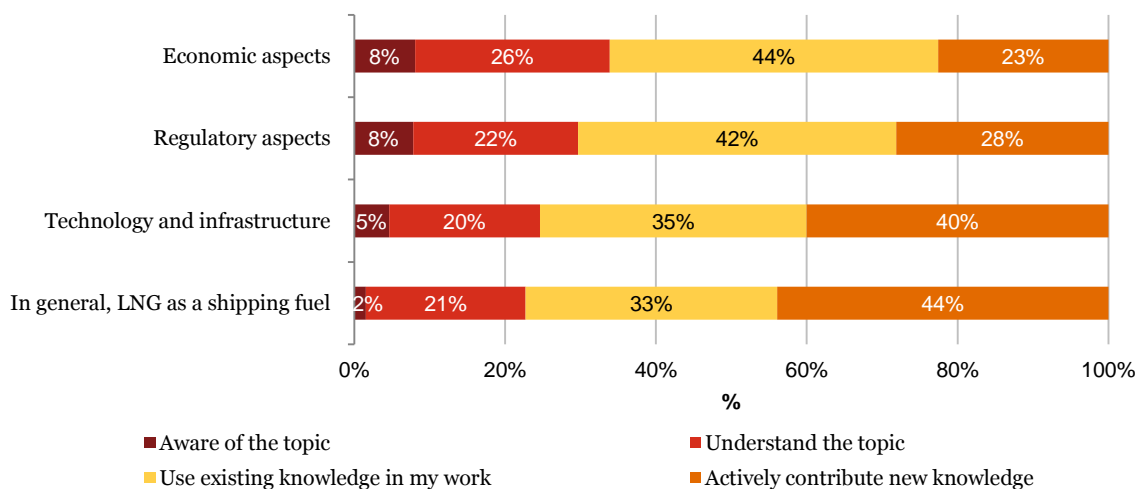


Figure 7 – Knowledge and behaviour towards LNG as a shipping fuel

Since the majority of the survey respondents are aware, understand and some even actively contribute to new knowledge, it is no surprise that the majority of survey respondents are actively involved with LNG during their working time: nearly 20% of the survey respondents claim to be active with LNG between 3 to 5 days per week.

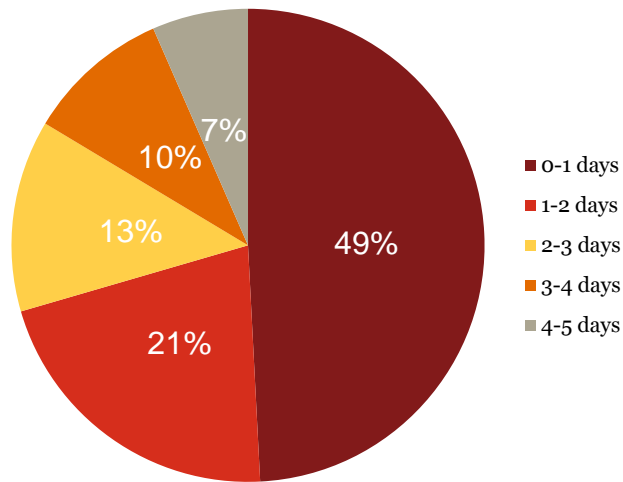


Figure 8 – Number of days per week actively involved with LNG

Consequently, a high degree of support from organizations has resulted in a high degree of active involvement in LNG as a shipping fuel. Nearly 90% of the respondents state that their employers are (very) supportive of LNG shipping fuel in the medium to long run.

Shipowners and gas companies are in general very supportive of LNG as a shipping fuel. Only 21% of the shipowners and ship managers state that their organization is "not so supportive" versus 11% of the gas suppliers.

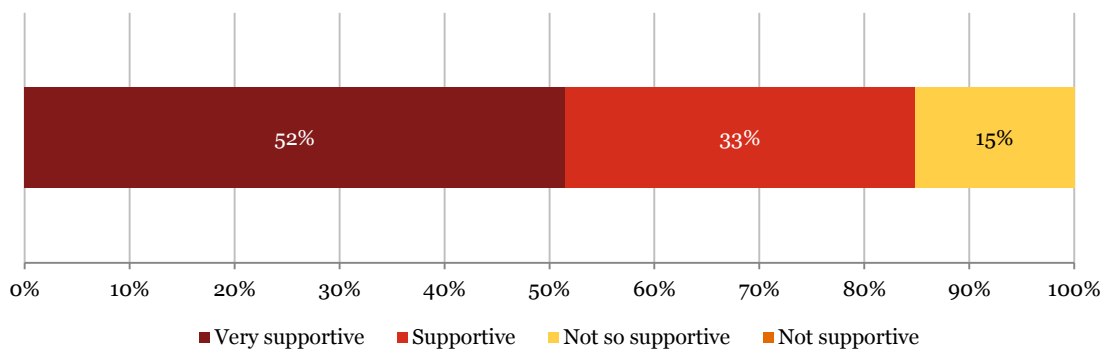


Figure 9 – Organizational support for LNG as a shipping fuel

4.3. Opportunities and barriers regarding LNG

During our desk research, a list of opportunities and barriers was identified. Those opportunities and barriers are listed and analysed below. A survey was developed to gather feedback from industry professionals and organizations on the listed items. Furthermore, we conducted personal stakeholder interviews to discuss the survey results and thus add a qualitative dimension to the analysis.

4.3.1. Opportunities

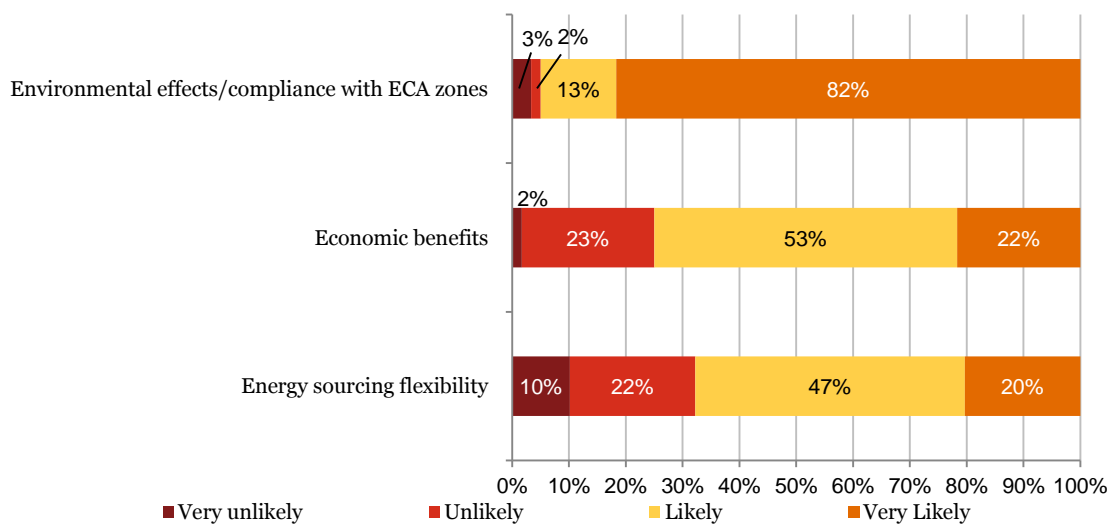


Figure 10 – Contribution to opportunities for LNG as a shipping fuel

The lion’s share of the survey respondents stated that the opportunities are (very) likely to contribute to positive effects for LNG shipping fuel. The (most) likely opportunity for LNG is to contribute to positive environmental effects (95%), followed by economic benefits (75%) and energy sourcing flexibility (67%).

The general tenor of the stakeholder interviews supported this. In terms of the positive environmental effects all stakeholders understand and agree that LNG is a cleaner fossil fuel alternative to fuel oils and diesels in theory. Nearly all stakeholders argued that there is a strong correlation between the percentage of time spent in ECAs and economic benefits of LNG: LNG as a fuel might not be economically beneficial to all stakeholder groups, i.e. oil tanker or dry bulk vessel operating to the highest percentage outside of ECAs, etc. In terms of energy sourcing flexibility many see opportunities for example in technologies such as dual fuel engines, however economic aspects strongly constrain sourcing flexibilities. Other remarks mentioned by the survey respondents are that LNG will be cheaper than MGO and HFO in the long term. One of the respondents mentioned that there are insufficient bunker ships and stations available at the moment.

Gas suppliers are obviously more favourable towards LNG as a shipping fuel as they believe that it will provide more flexibility in energy sourcing and contribute to a range of environmental benefits. This is in contrast to shipowners, who are divided amongst themselves and have different opinions on the likelihood of economic and energy sourcing benefits. Based on the various responses, it seems that the experiences with LNG differ among shipowners and that the financial aspect has been and will be key in their attitude towards economic and sourcing benefits. The majority of shipowners are

generally in favour of LNG but the barriers regarding financing and harmonized standards are difficult to overcome. A smaller percentage of shipowners have already ordered LNG-fuelled ships or are actively investigating it⁷.

Environmental benefits

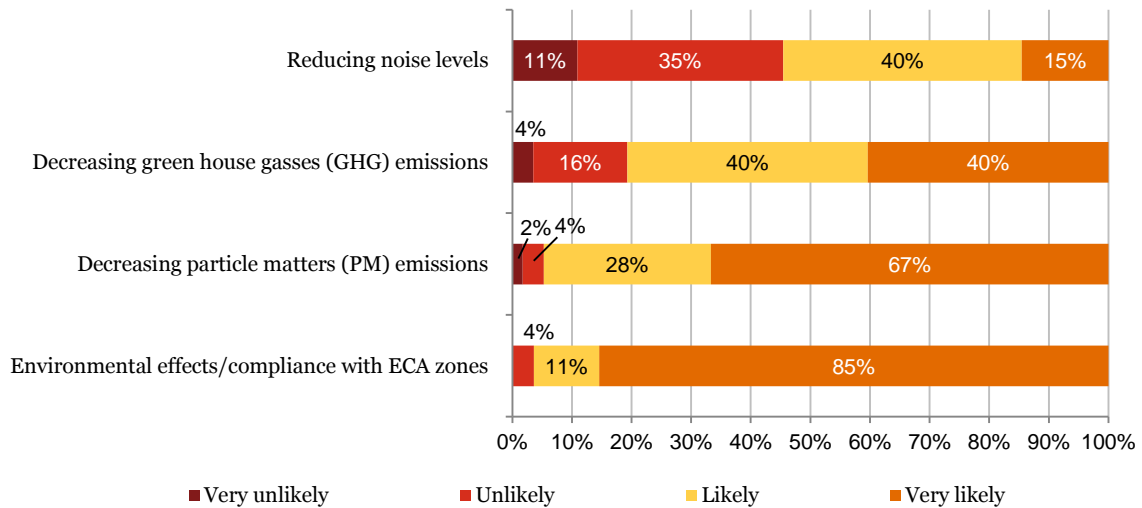


Figure 11 – Contribution to environmental benefits of LNG as a shipping fuel

The environmental benefits of LNG were rated high by a majority of the respondents. However, it has to be mentioned that the majority of companies acknowledges to be "forced" into those environmental benefits (especially the reduction of sulphur emissions) by the step-by-step tightening of the respective regulation.

When looking more specifically into the environmental benefits of LNG as a shipping fuel, the survey respondents stated that the environmental benefits such as decreasing particle matters (PM) and greenhouse gasses (GHG) emissions are (very) likely the result when LNG will be used as a shipping fuel. Other environmental benefits mentioned are engine efficiency and reduced use of chemicals on board. The opinions on the noise levels of LNG-fuelled engines are split: about 55% of the respondents argued that noise levels are likely to be lower (than conventional engines), 45% of the respondents do not expect lower noise levels.

Insights from the interviews partially explain why a few stakeholders do not believe that LNG as a fuel will decrease **GHG emissions**: of major concern are technical engine issues (incomplete combustion) resulting in "methane slip" (which offsets much of the GHG benefit of LNG as a fuel). Engine manufacturers however argued that total GHG emissions are still reduced, arguing that the engine technology has significantly developed and now leads to nearly no methane slip any more. Accidental methane release may also occur during the bunkering procedure. There was general agreement amongst the interviewees that fine particle matters can be substantially decreased by LNG, due to its composition as well because of a reduced use of fuel oils and diesels. Many do not believe that **noise levels** will be reduced, as they argued that LNG would

⁷ An analysis of the LNG market development was conducted by LOT 3 of this study. It will be available by end of 2015

only be economically viable in dual fuel engines, and these would still use fuel oil and therefore not be much quieter.

Economic benefits of LNG

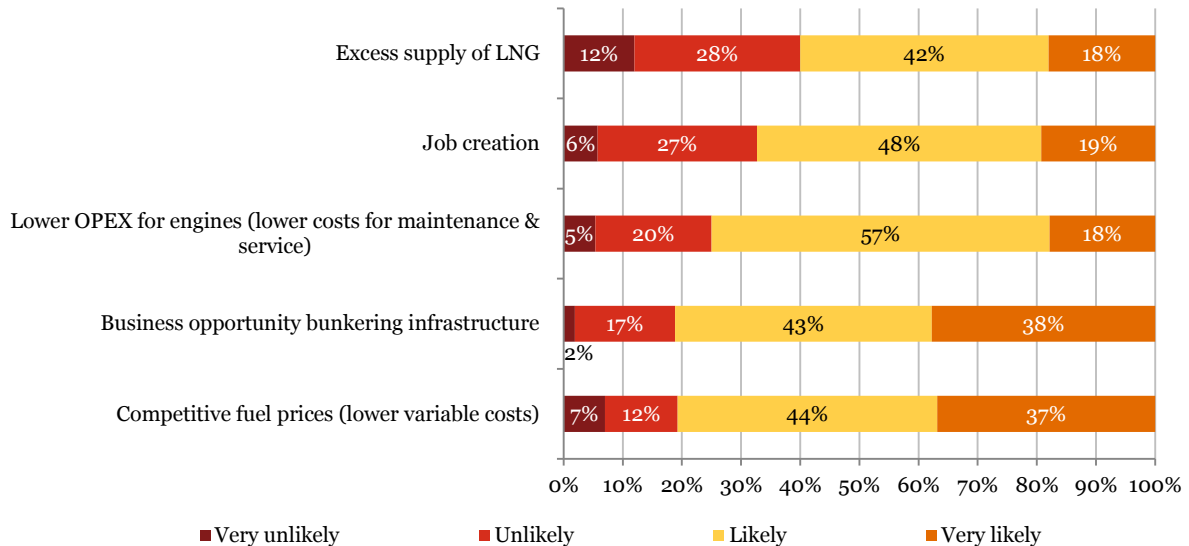


Figure 12 – Contribution to economic benefits of LNG as a shipping fuel

The opinions among survey respondents differed more when discussing the economic benefits of LNG usage. The majority of the survey respondents think that it is (very) likely that there are economic benefits: competitive fuel prices (81%), business opportunities regarding bunkering infrastructure (81%), lower OPEX for engines (75%) and excess supply of LNG (60%).

Most interviewees' highlighted that competitive fuel prices can create economic benefits. However, this is largely dependent on the percentage of time spent in the ECAs, as LNG prices are not necessarily competitive to HFO prices. The competitiveness of LNG becomes more apparent in comparison to low sulphur fuels such as MGOs, LSHFOs, and HFOs and scrubber investments. Some interviewees argued that a driving force to the economic benefits could likely be the forecasted excess of supply due to shale gas production. This could lead to price reductions and convergences in the medium to long term, however this was argued to be wholly related to and dependent on the LNG suppliers' pricing behaviour, which currently is severely lacking transparency. Interviewees further argued that a decoupling of gas from oil prices is expected. Some interviewees argued that OPEX for engines are indeed lower, as the maintenance costs are lower. There is however a strong sentiment that lower OPEX will only truly become the status quo with economies of scale, as for example spare equipment parts are still very expensive.

Some survey respondents stated that they believe that job creation (33%) is (very) unlikely to be an economic benefit of LNG as a shipping fuel. During the interviews with bunker suppliers it became obvious that LNG bunkering capacity would most probably substitute existing conventional bunkering capacities. Therefore no significant number of newly created jobs can be expected. From the point of view of shipping companies, the creation of additional jobs is not expected.

Energy sourcing benefits of LNG

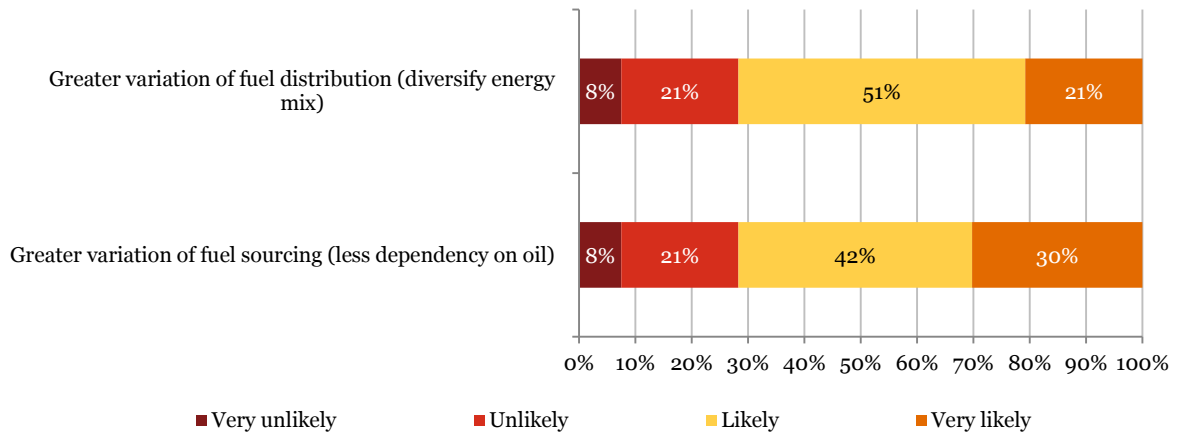


Figure 13 – Contribution to energy sourcing alternatives

More than 70% of the survey respondents believe that greater variation of fuel sourcing will (very) likely contribute to energy sourcing alternatives, while the same percentage believe that is also the case for greater variation of fuel distribution (diversifying energy mix).

Despite this relatively strong result for the variation of fuel sourcing, the interviews showed that this argument is mainly valid for certain stakeholder groups: port authorities (and to lesser extent municipalities) have an interest in offering a broad range of fuels. For shipping companies, the ubiquity of marine gas oil and heavy fuel oil across ports means that there is no strategic need for an alternative fuel for this stakeholder group. Gas suppliers are more optimistic about the positive effects of greater variation of fuel sourcing and distribution.

4.3.2. Summary of the opportunities

Overall the survey respondents agreed and confirmed the likelihood of the suggested opportunities and benefits as a result of LNG as a shipping fuel. The interviews gave further insight to certain aspects such as environmental and economic benefits, there is however a need to further evaluate the aspect of energy sourcing alternatives as an opportunity for the introduction of LNG as a shipping fuel.

Environmental opportunities

The general consensus, shared by survey respondents and interviewees is that the positive environmental effects provide the biggest opportunity of LNG as a shipping fuel. This is underlined by the fact that 98% of survey respondents agree that LNG is (very) likely to have positive environmental benefits, which many interviewees explain by simply arguing that LNG is the cleaner fossil fuel alternative compared to conventional fuel oils.

Looking a bit more into the detailed analysis of the environmental benefits there is general agreement that LNG supports the compliance with environmental regulation (namely ECA zone compliance). The majority of respondents confirmed the contribution of LNG fuel to the reduction of particle matters and GHG emissions – although there is slightly less consensus regarding this point (this would be due to the methane slip

issue). The expectation of less noise emissions by LNG-fuelled engines was only shared by around half of the respondents.

The survey results confirmed the importance of environmental regulation: 98% of survey respondents agreed that the positive environmental effects of LNG can help them comply with regulations. Although the positive actual environmental impact of LNG as a fuel is generally confirmed, it is mainly the regulations that motivate the survey participants to switch to an environmentally friendly fuel such as LNG.

Economic opportunities

Looking at the economic opportunities of LNG as a shipping fuel, the majority of the survey respondents agreed that it is (very) likely that the introduction of LNG will have positive economic effects. Many interviewees argued that the positive economic effects closely correlate to the shipping time spent in ECAs, which might partially explain why approximately one-fourth of the respondents argued that is (very) unlikely that the introduction of LNG will have positive economic effects.

The detailed analysis of the economic benefits further supports the line of argument that positive economic effects correlate to the shipping time spent in ECAs, as 81% of survey respondents (highly) agreed that LNG prices can be competitive with conventional fuel oils. It is important to highlight that this correlates directly to the shipping time spent in ECAs, as some interviewees emphasized that LNG prices are only competitive to low sulphur fuel oils like MGO and LSHFO, which in turn are required to comply with environmental regulation.

There are also further economic benefits which do not directly correlate to the shipping time spent in ECAs, such as lower OPEX for LNG engines, potential business opportunities for bunkering infrastructure, excess supply of LNG and job creation. The majority of survey respondents agreed that the introduction of LNG is (very) likely to create economic benefits in the before mentioned points, especially concerning the potential business opportunity for bunkering infrastructure which the majority of survey respondents agree to.

Energy sourcing opportunities

The survey results show that there was little agreement amongst the different stakeholder groups that LNG offers opportunities regarding energy sourcing. This might be further explained by the interviews, as only certain stakeholder groups consider the energy sourcing alternative to be an opportunity. Port authorities (and to lesser extent municipalities) have an interest in offering a broad range of fuels. For shipping companies, the ubiquity of marine gas oil and heavy fuel oil across ports in the world is mostly sufficient. This emphasizes that there is less of a general consensus on this topic, and thus has to be further evaluated.

In general, the majority of shipowners believe that environmental and economic benefits will (very) likely contribute to a positive uptake of LNG as a shipping fuel, while the group is divided amongst themselves regarding energy sourcing flexibility. It is noteworthy that the majority of the group thinks it is unlikely that the reduction of noise levels and excess supply of LNG will positively influence the adoption of the fuel. In addition, opinions differ greatly among shipowners regarding the greater variation of fuel distribution.

4.3.3. Barriers

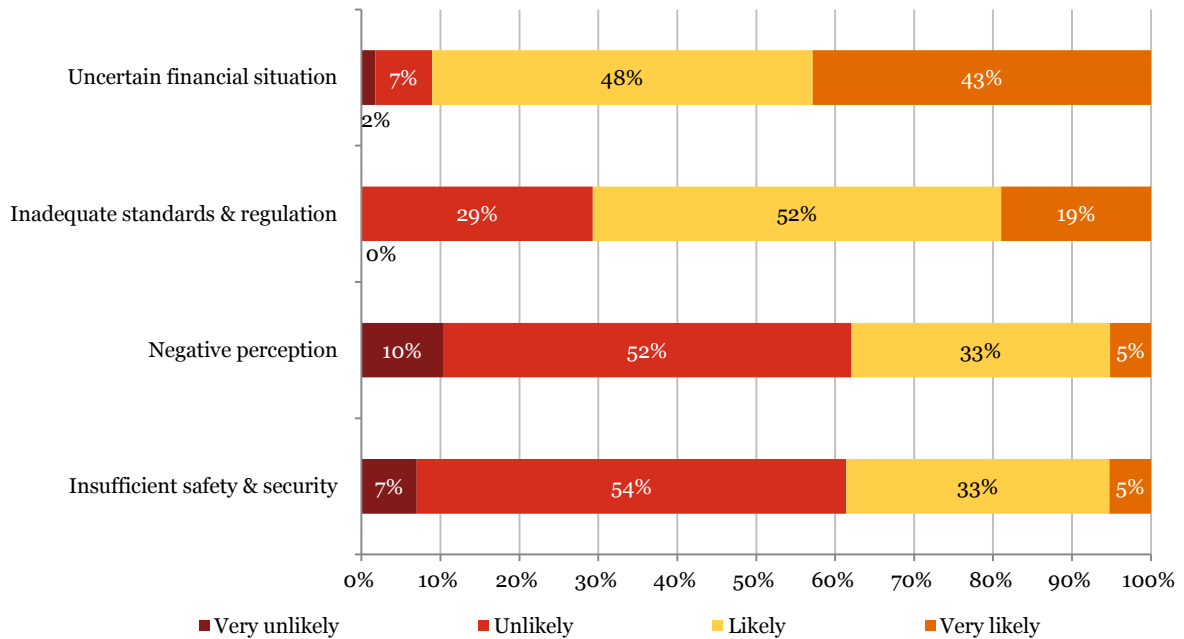


Figure 14 – Barriers for LNG as a shipping fuel

The opinion of the survey respondents differed when looking at the barriers for LNG as a shipping fuel. Of the proposed aspects, an uncertain financial situation is the highest barrier according to the survey respondents, followed by inadequate standards and regulations (71%), insufficient safety & security (38%), and negative perception (38%). Other barriers mentioned by the survey respondents were training for crews and long handling times for land-based authorities.

The quantitative analysis was supported by the stakeholder interviews. Most concerns lay within financial aspects, such as higher CAPEX for LNG-fuelled vessels and potentially longer amortization. Some argued that inadequate standards and regulations are a barrier but that the IMO International Gas as Fuel Code will substantially help. Not all interviewees agreed with the survey respondents that insufficient safety & security is (very) unlikely to act as a barrier for the introduction of LNG as a shipping fuel, as many shipowners and operators argued that there is a substantial lack of properly trained crews in handling LNG safely. Negative perception of LNG in general was hardly seen as a barrier during the interviews.

Apart from local interest groups, shipping and gas companies believe that a negative perception of stakeholders (particularly the public and crew members) is unlikely to have an influence on the uptake of LNG as a shipping fuel. In contrast, they believe that it is likely that inadequate standards, regulations and uncertain financial situation will have a negative impact on LNG. With regards to insufficient safety and security, shipowners are divided amongst themselves, whereas gas suppliers are more optimistic. No specific pattern or trends could be found within these segments.

Negative perception effects on LNG

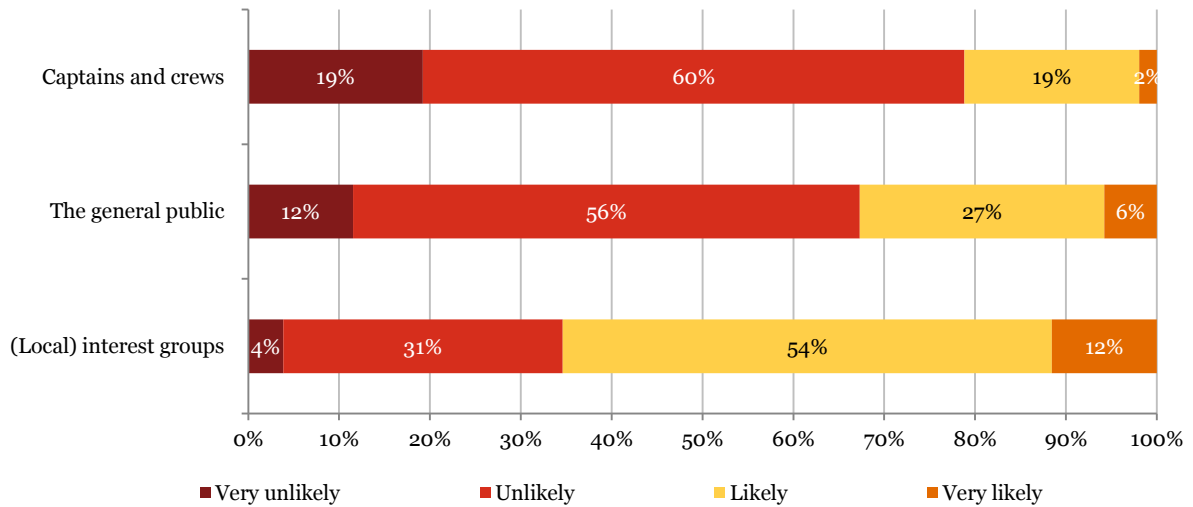


Figure 15 – Contribution to negative perception for LNG as a shipping fuel

The highest contribution to negative perception for LNG as a shipping fuel as rated by the survey respondents are related to (local) interest groups. Some survey respondents added that methane slip is an issue to consider. However, some NGOs like in the Netherlands understand the positive environmental effects and, therefore, are a bit more supportive for LNG as a shipping fuel. Most interviewees argued that gas is already very much a part of daily lives, as many heat their houses with gas, gas is used to produce electricity, etc. and that it is generally seen as “greener” than fuel oils.

Generally, the contact to NGOs and municipalities in the course of this project has shown that the level of awareness for LNG as a shipping fuel within this group is relatively low. As mentioned earlier in the report, the willingness to participate in our survey was very low. The most important reason for not willing to participate in the survey was the statement that the respective organization does not have an opinion on LNG as a fuel.

Suggestions were solicited from the survey respondents with respect to communication to the public to create further awareness:

- Demonstrate how safety is addressed by means of safety records
- Point out the benefits of LNG as a shipping fuel and how governments are supporting these initiatives
- Overall understanding of LNG as a fuel has to be supported by sound technical information. Only by addressing the real environmental signature of LNG can this be accepted as an honest option. Public opinion is often more responsive when negative aspects are taken into account and shown upfront.
- Present validated emissions measurements on real-world emissions of LNG
- Inadequate standards and regulations effects on LNG

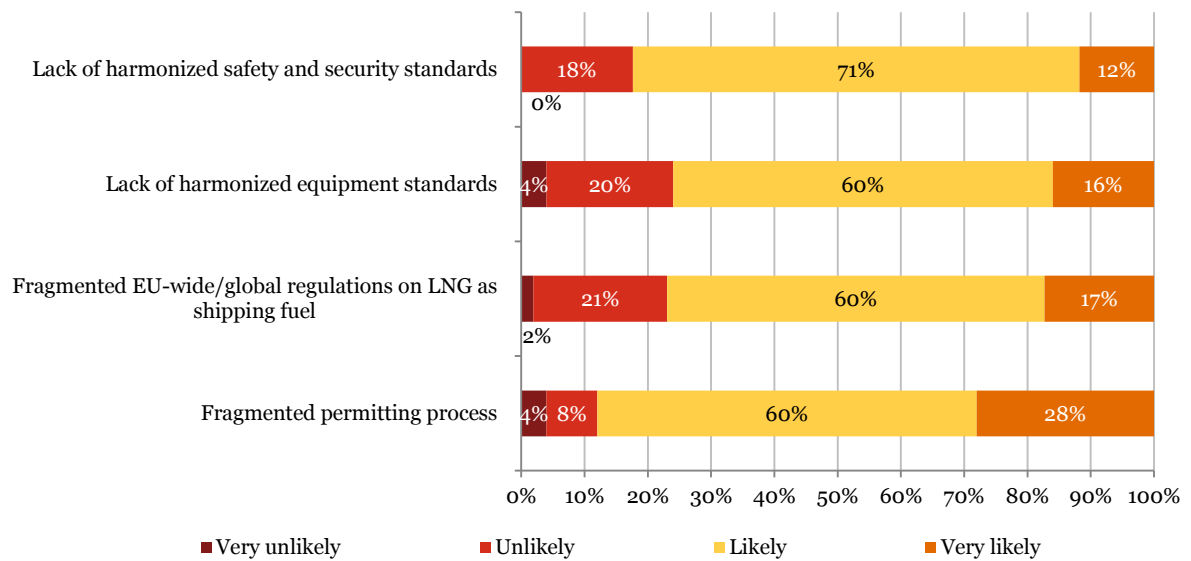


Figure 16 – Contribution to inadequate standards and regulations

The highest contribution to inadequate standards and regulations is the fragmented permitting process; nearly 88% of the respondents think that it is a barrier for LNG as a fuel. The other barriers are equally perceived as hindrances for adequate standards and regulations: lack of harmonized safety and security standards (83%), lack of harmonized equipment standards (76%), and fragmented EU-wide/global regulations (77%). Other barriers mentioned by the respondents are education, training and gas quality.

Interviewees agreed that the lack of equipment, safety and security standards for LNG as a fuel has so far been a strong barrier. However this is expected to change now that the IMO's International Gas as Fuel Code (IGF Code) has been adopted by the Maritime Safety Committee in June 2015. It will enter into force in January 2017, which will be a substantial step ahead. The interviewees (especially shipowners and charterers) are more worried about the lack of harmonization as for many of them shipping is considered a global industry and requires globally harmonized standards.

Furthermore, it became very apparent in the interviews, especially with port authorities and terminal operators, that permitting processes create the biggest barrier, as they argued that the lack of experience with small-scale LNG infrastructure makes the local and regional permitting process very complicated and thus expensive and time-consuming.

In terms of fragmented EU-wide/global regulations and permitting process on LNG, both gas and shipping companies believe that it will have a negative effect on the uptake of LNG. Shipowners are more concerned about a lack of harmonized safety and security standards and general safety risks of handling LNG than gas suppliers. With regards to the lack of harmonized equipment standards, gas suppliers are more optimistic than shipping companies in terms of the negative effect on LNG.

Insufficient safety and security effects on LNG

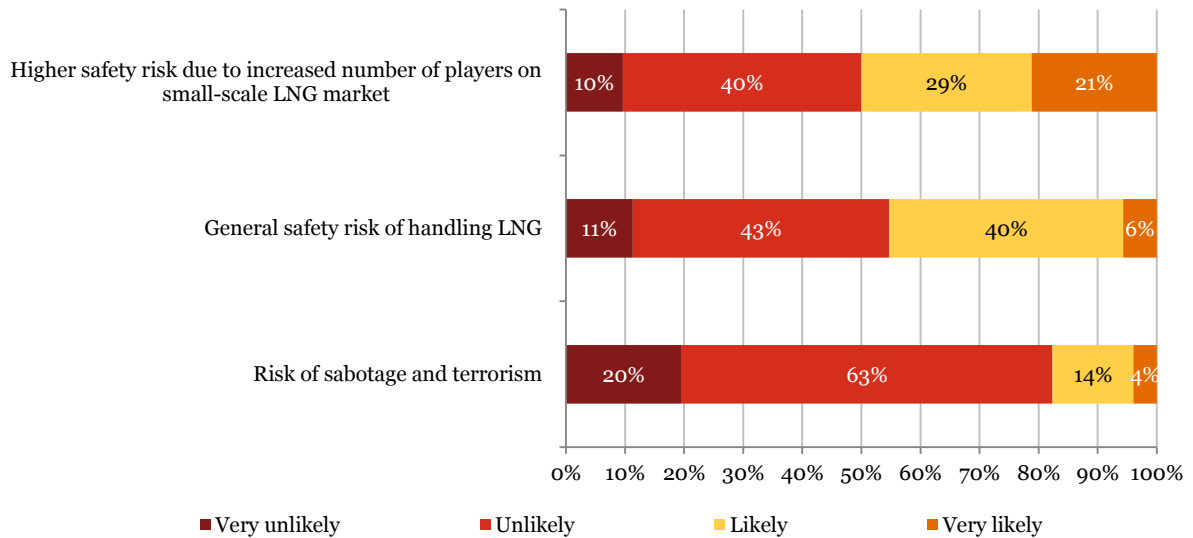


Figure 17 – Contribution to insufficient safety & security

The opinions of industry professionals regarding safety and security are divided. The majority of the respondents believe that there is a higher safety risk due to the increased number of players on the small-scale LNG market, of which half of the respondents believe that is very likely. The general safety risk of handling LNG is perceived as (very) unlikely by nearly half of the respondents, while the risk of sabotage and terrorism is rated by more than 80% of the respondents as (very) unlikely.

The difference in opinion concerning higher safety risks due to an increased number of players on the small-scale LNG market was also apparent during the interviews. Some interviewees argued that the barriers to entry in the small-scale LNG market are very high, hence mainly major players will be able to enter the market in the short to medium run and these lay extreme importance on security issues. They also argued that by the time a higher number of players can enter the small-scale LNG market security standards will also be strongly developed and thoroughly enforced. The difference in opinion could thus be explained by a different view on time spans. A difference in opinion concerning general risks of the handling of LNG closely relate to the latter point. Many interviewees agreed, however, that there is a need to further train ship crews and bunker suppliers to handle LNG. The risk of sabotage and terrorism is generally perceived as low due to very limited conditions under which a flammable or explosive mixture can be viable.

Uncertain financial situation effects on LNG

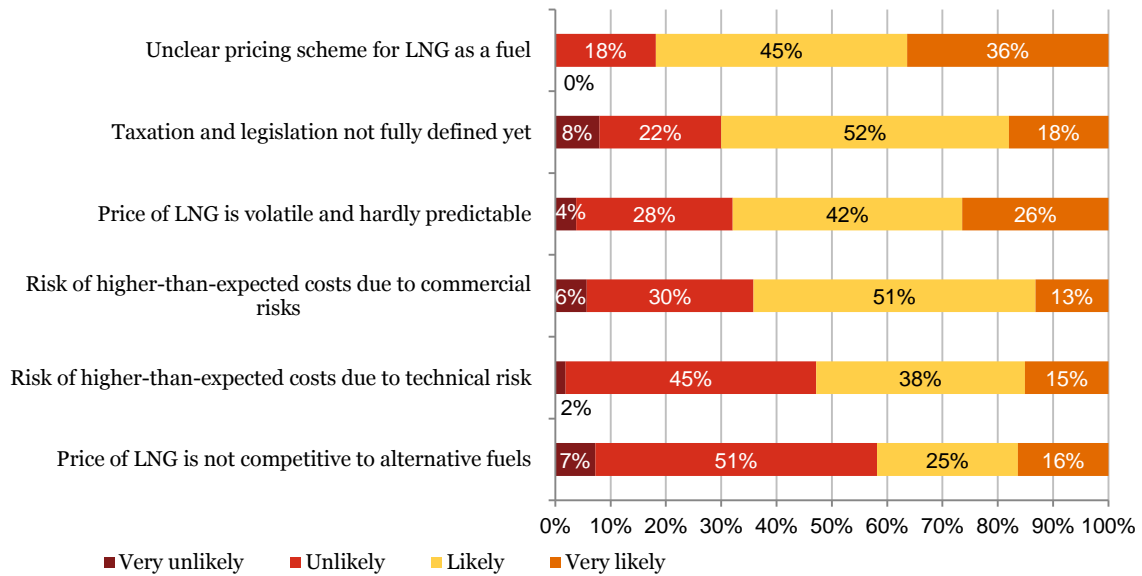


Figure 18 – Contribution to uncertain financial situation

An uncertain financial situation, an unclear business case, and insufficient funding are the most-mentioned barriers for the uptake of LNG as a shipping fuel. These arguments are dependent on a few factors: unclear pricing schemes, volatility of LNG pricing, unclear taxation and legislation, competitiveness of LNG with alternative fuels, technical and commercial risks. The interviewees strongly support that the uncertain financial situation is the main barrier to the development of a small-scale LNG market. From the shipowners’ perspective there is a lack of demand from charterers for LNG-fuelled vessels due to the lack of price transparency, uncertain price developments and in general the lack of willingness to cover the higher CAPEX.

Shipping companies are more concerned than gas companies that an unclear pricing scheme, volatility of LNG prices and uncertainty of higher technical costs will hinder the uptake of the alternative fuel. In addition, shipping companies are quite divided in their opinions towards the funding of LNG; half of the respondents are concerned, whereas the other half are less or not concerned. The shipowners are most divided amongst themselves on the topics of LNG price and financial risk due to technical aspects. There was no particular pattern or trend within the segment shipowners. The interviewees also supported the quantitative statistics that uncertain taxation frameworks enforce a constraint for investments in LNG as a shipping fuel.

Additional comments about the barriers of LNG made by the respondents included:

- Infrastructure companies (Air Liquide, Linde) are used to expensive infrastructure – but commodity trading and bunkering (and shipping) companies are not. The low number of suppliers of technical equipment keeps the costs high at the moment (manufacturers charge a premium).
- There are strict requirements developed for LNG by the IMO/CCR. A lack of technical evidence could limit the acceptance of LNG as a fuel.
- There are not sufficient LNG storage facilities in Europe; this could also be a barrier for organizations.
- The enforcement of the further ECA is not clear yet. Shipping companies might be less willing to switch to LNG if the further ECA enlargements are unclear.

4.3.4. Summary of the barriers

Negative perception

The general consensus, shared by survey respondents and interviewees, is that negative perception does not pose a severe barrier for the introduction of LNG as a shipping fuel. Two-thirds of the survey respondents argued that it is (very) unlikely that this will be the case. Many interviewees are not very concerned with this aspect, as they argued that gas is already very much part of daily lives, as many heat their houses with gas, and that it is generally seen as "greener" than conventional fuel oils.

The detailed analysis shows that the negative perception on the part of (local) interest groups poses the highest probability to acting as a barrier to the introduction of LNG as a shipping fuel. Two-thirds of the survey respondents agreed on this. Interviewees argued that this can be explained by lack of objective information as well as an emotional relation to the larger picture of the LNG value chain, i.e. shale gas production, etc. However, the attempt to get an opinion from a larger number of NGOs and municipalities showed that the level of awareness for LNG as a fuel is still relatively low in this group.

Inadequate standards and regulations

Looking at the aspect of inadequate standards and regulations, two-thirds of survey respondents as well as many interviewees agreed that this poses a barrier to LNG as a shipping fuel. In terms of standards, such as safety, security and equipment standards, nearly three-fourths of the survey respondents argued that the current lack of harmonization is (very) likely to pose a barrier for LNG. It is important to highlight, which is especially put forward by the interviews, that this has been the case currently, but that there is some optimism that the introduction of the IMO International Gas as Fuel Code will help on this issue. In terms of regulation, especially concerning the permitting process, the greater majority (87%) argued that this is (very) likely to pose a barrier for LNG. This is also emphasized by many interviewees, who argued that the novelty of small-scale LNG is met with lack of experience on the part of local and regional regulatory authorities, creating slow development of the permitting processes. The enforcement of the ECA zone emission rules and fines expected for not complying with these rules may be an additional barrier for the uptake of LNG as a fuel.

Insufficient safety and security

Opinions on insufficient safety and security posing a barrier to LNG as a shipping fuel differ quite substantially, although the majority of survey respondents argued that this aspect is (very) unlikely to act as a barrier.

Looking into the detailed analysis, the general safety risks of handling LNG as well as the higher safety risks due to an increased number of players on a small-scale LNG market are seen by survey respondents as slightly more likely to pose a barrier. Most interviewees argued that it is a matter of training the crews and bunker suppliers, some being optimistic that this will not be a great issue, others on the other hand emphasized that it is an issue. The latter, however, also strongly correlates to safety and security standards.

Concerning the risk of sabotage and terrorism, the general consensus from both survey respondents and interviewees is that it is (very) unlikely to pose a barrier to LNG.

Uncertain financial situation

Concerning the uncertain financial situation aspect, the general consensus of survey respondents and interviewees is that this poses the strongest barrier to LNG as a shipping fuel. Nearly all interviewees agreed, that currently most business cases for the conversion to LNG as a shipping fuel do not add up. This was explained to have to do a lot with the higher CAPEX and potentially longer amortizations.

The detailed analysis supports this argument. Uncertainty is especially being driven by unclear pricing schemes for LNG as a fuel, to which the majority of survey respondents agreed. Other factors which the majority of survey respondents agreed to be (very) likely to pose a barrier to LNG as a shipping fuel are price volatilities, the risk of higher-than-expected costs due to the immaturity of the small-scale LNG market, as well as uncertainties concerning taxation and legislation.

In general, the majority of shipowners believe that negative perception will unlikely be a barrier for the uptake of LNG (of which the most influential groups may be the public and ship crews), in contrast to an uncertain financial situation. Fragmented EU-wide regulations and lack of harmonized equipment, safety and security standards and LNG price are mentioned as very likely to be barriers for the adoption of LNG. The group is divided amongst themselves about higher safety risks due to an increased number of players on the small-scale LNG market and the degree of competitiveness of LNG in comparison to alternative fuels.

NGOs are "not so supportive" to "supportive" about LNG as a shipping fuel. The reason is that especially the environmental NGOs want to move away from fossil fuels completely and many argued for the use of biofuels instead. They understand that LNG is to be used as a transitional fuel, and all agree that it has positive environmental effects compared to heavy fossil fuels. Many are worried about high investments being made, and that this will prolong the mid- to long-term adoption of renewable fuel sources for the shipping industry. They would rather see the same amount of investments in renewable fuel sources, or stronger focus on these in parallel.

One other potential barrier mentioned in the stakeholder interviews was the issue of so-called "methane slip", caused by an incomplete combustion in the engine leading to the emission of small amounts of methane to the atmosphere, mixed with the combustion gases. Even though engine technology is evolving towards a zero-methane emission goal this is still an important point when it comes to the optimization of overall LNG environmental benefits.

4.4. Confidence of LNG uptake

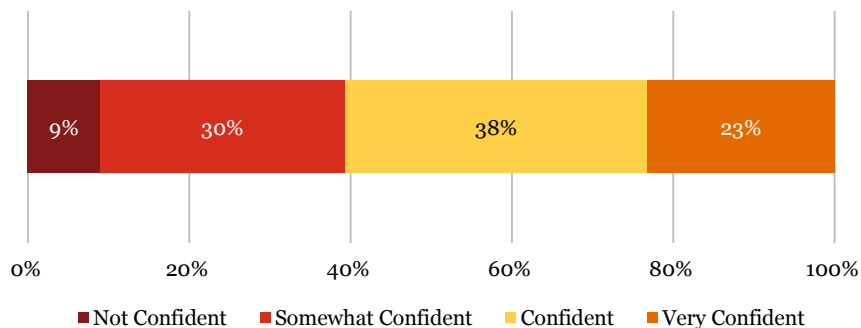


Figure 19 – Confidence of the adoption of LNG as a shipping fuel across the value chain

The majority of the respondents are confident that LNG as a fuel will be adopted across the value chain. Only 9% are not confident as opposed to 23% who are very confident about the adoption. The interviews supported these findings; further insight shows that most believe that adoption will be gradually starting. Naturally, gas suppliers are more confident about the adoption of LNG in the future. Therefore, nearly 90% of these industry professionals indicated that they have already been involved and will continue with LNG activities (versus 50% of the shipowners).

Overall there is no general consensus among NGOs on the confidence about LNG adoption of LNG across the value chain, some are "not confident", others "somewhat confident". This may be argued to be due to the hopes of advancements in renewable fuel source technologies.

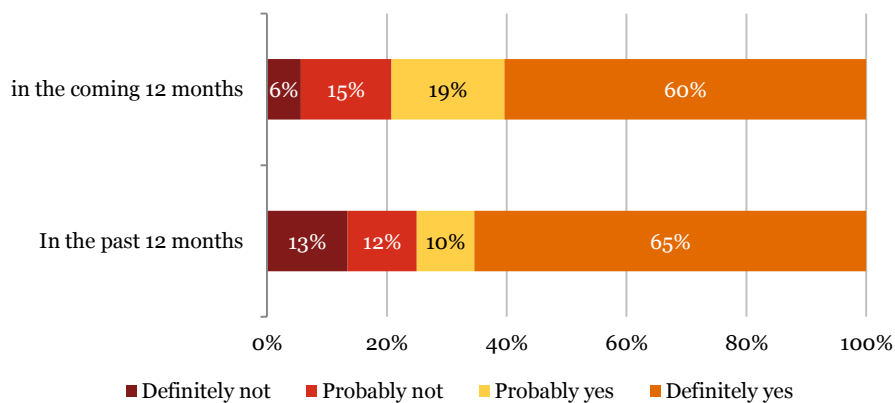


Figure 20 – Involvement in LNG activities

Many respondents have been involved in or are planning LNG activities; 60% of the respondents have already been involved and two-thirds are planning to do so. However, it is noteworthy that there are some respondents who believe they or their organizations definitely will not be involved in LNG activities. This could be attributed to a general conservatism of the shipping industry, where many interviewees argued that they are waiting to see how the market will develop before they start adapting their businesses.

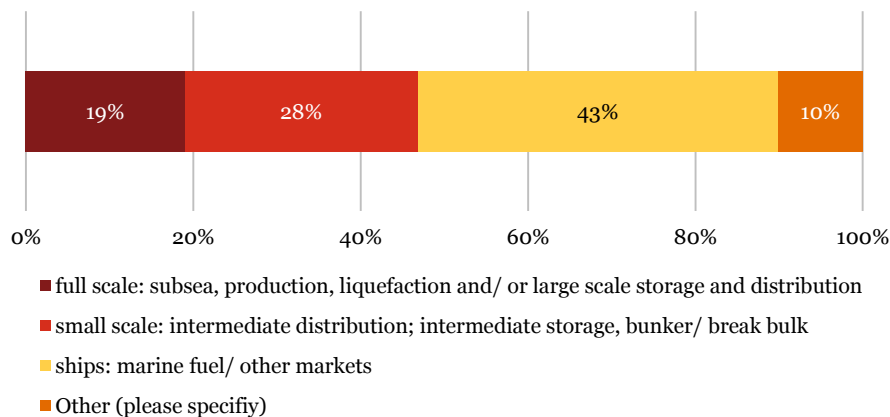


Figure 21 – Recent LNG activities of organizational involvement

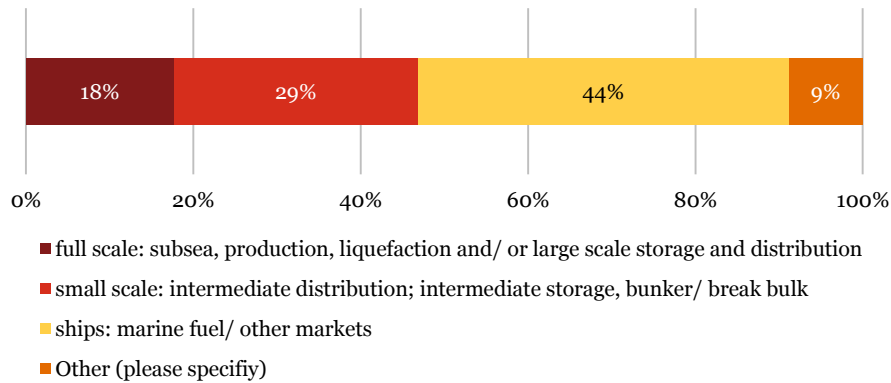


Figure 22 – Upcoming LNG activities of organizational involvement

A respondent commented as follows: "In general I would see LNG as a very viable economic solution. But with the now decreasing oil prices, ample of refinery capacity, difficult shipping industry etc. I do not see major steps forward and only limited LNG shipping projects in the next one to two years. US coast may be different, as cheap oil is counterbalanced by cheap gas."

The majority of the activities are related to LNG ships, followed by small- and full-scale LNG, where the differences between the past and coming year are very small. Other activities mentioned by the respondents are consulting, research, LNG chartering, FSRU, shipping of LNG, and regulations.

The interviews gave the impression that because of the strong support towards LNG as a shipping fuel from most organizations many stakeholders are actively assessing their potentials, as for example through feasibility studies, cost-benefit analysis, etc. This could furthermore explain why there is a high degree of activity, but a lack of visual and tangible outcomes. In a few interviews, we received information that concrete plans for market entries had already been formulated, that these however had been paused or vetoed against mainly due to uncertain financial situations.

An oil and gas company mentioned that it is having difficulty in finding and persuading customers to switch to LNG as a fuel. There are various opportunities in Europe and the United States, but there are no specific actionable business opportunities yet. In addition, it is quite expensive to retrofit existing vessels – therefore the general assumption is that LNG is only economically feasible for new-builds.

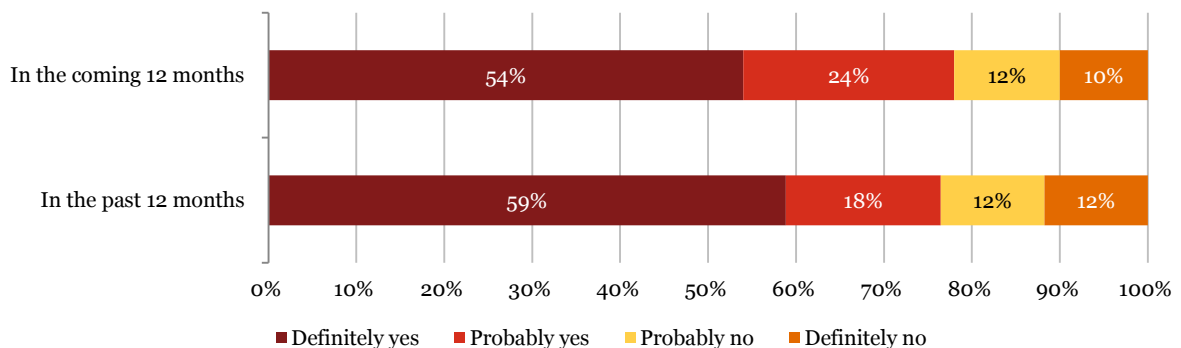


Figure 23 – Partnering with other organizations to enable/accelerate LNG activities

The majority of the respondents (>50%) stated that they definitely would partner with other organizations to either enable or accelerate their LNG activities, which include, among others, development of storage facilities, converting vessels to LNG, and cooperating with NGOs to develop further standardization and guidelines.

In terms of partnering, more than 70% of the gas suppliers have partnered with other organizations to enable or accelerate LNG activities (versus 43% of shipowners and managers).

Various organizations were mentioned whom the survey respondents and their organizations would partner with. A selection of the responses:

- Industry associations, e.g. SMGF, WPCI/IAPH, LNG platforms
- Expert groups, e.g. ESSF
- Governmental institutions: European Commission, local authorities
- Energy suppliers
- Port authorities
- Shipyards
- Classification societies
- Technical committees, universities and other research institutions

Summary of LNG activities and partnerships

When evaluating the responses regarding current and future LNG activities, it becomes apparent that many respondents have been involved with LNG in some way. The majority believes that partnerships are a way to enable and accelerate their business and are seeking various partners. When taking into account the attitudes towards the opportunities and barriers of LNG as a shipping fuel, it can be concluded that the adoption of LNG is a sector-wide topic. Also, it becomes evident that some industry groups are further advanced in exploring opportunities; while some have searched for opportunities outside the European Union, others have explored developing new standards.

4.5. Additional survey insights

The response rate among the selected and invited respondents was high⁸, mainly due to the fact that the majority of the respondents were personally invited and are part of PwCs, DNV-GLs and MSLGROUPs professional network. There were few respondents who declined to participate. Those who declined were either not supportive of LNG and/or not active in the field of LNG (yet). For example, many vessels (mainly oil carriers) travel to various ports without LNG infrastructure. This does not contribute to a positive development of a business model and, thus, no point-to-point business. At the moment, only the use of MGOs are apparent; scrubbers are no option for oil and gas companies, as there are strong environmental concerns related to this technology.

The response rates per individual question are included in Appendix 8.1. The average response rate for the closed questions is 73%.

⁸ The exact response rate cannot be estimated (because the information about the campaign and the link to the online questionnaire were widely shared), but we estimate that approx. 100-150 stakeholders received our request to participate in the survey. This results in an approximate response rate of 37-56%

4.6. Media preferences of the respondents

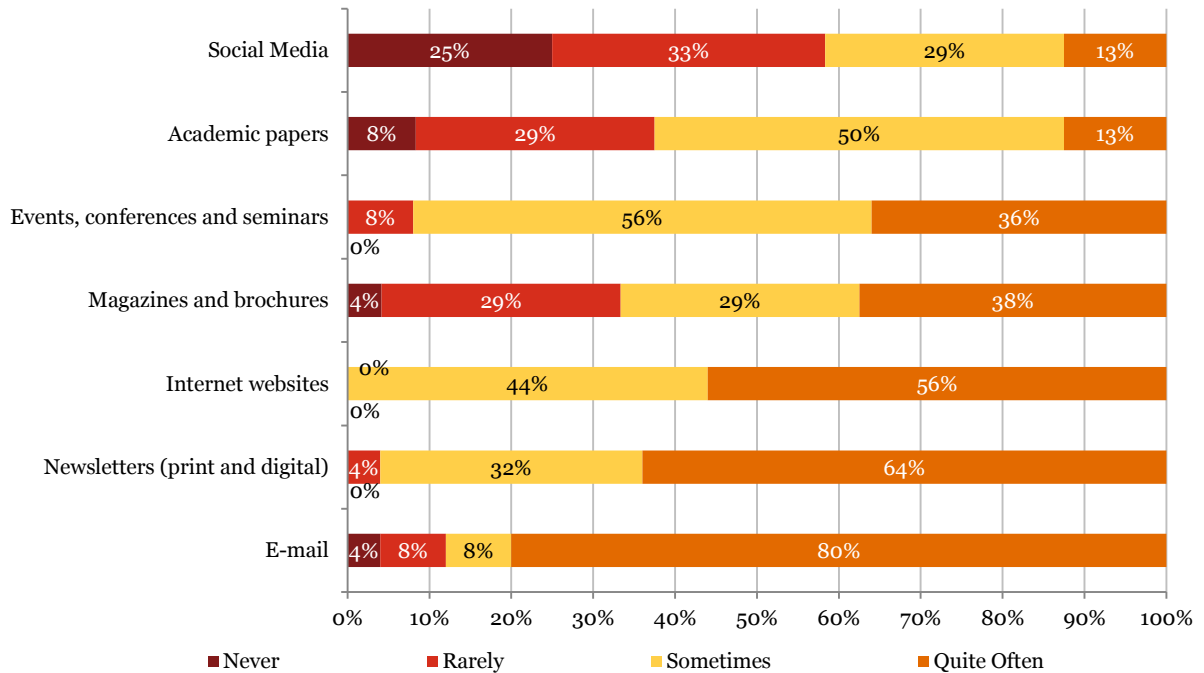


Figure 24 – General media usage for business purposes

The preferred media channels particularly for **updates on LNG**, ranked by most mentioned by first preference, were the following:

1. E-mail (34%)
2. Newsletter (print and digital) (24%)
3. Events, conferences and seminars (17%)
4. Internet websites (19%)
5. Magazines and brochures (5%)
6. Academic papers (2%)
7. Social media (0%)

The following selected organizations, expert groups, companies or websites were mentioned when the interviewees were asked which organizations and websites they regularly follow:

- ABS LNG Bunker
- Baltic region initiatives
- Bunkerspot
- Bunkerworld
- Danish Shipowners Association

- DNV-GL
- ESPO
- ESSF Subgroup on LNG
- European Commission
- Gasnam
- Gastech
- LNG Break Bulk Project
- Icis Heren
- Jornada GNL Santiago
- Lloyds List
- LNG World News
- Maritime Executive
- Maritime Journal
- Motorship
- SGMF
- SIGGTO
- TradeWinds
- WPCI

When asked what type of information the respondents miss in their current sources or expect to have in the future, the following answers were given:

- More LNG initiatives or other related updates
- More events targeted towards shipowners and charterers
- Integrated cross-country/-regional information and initiatives
- A European news or discussion forum where information about LNG is well structured
- The use of LNG as bunker for NON-LNG vessels⁹
- The opinion of public stakeholders

⁹ Response given by one of the survey participants. Assumed meaning: The respondent is expecting more information on the use of LNG for ships that are not yet converted to LNG propulsion ("NON-LNG vessels")

4.7. Profile of the respondents

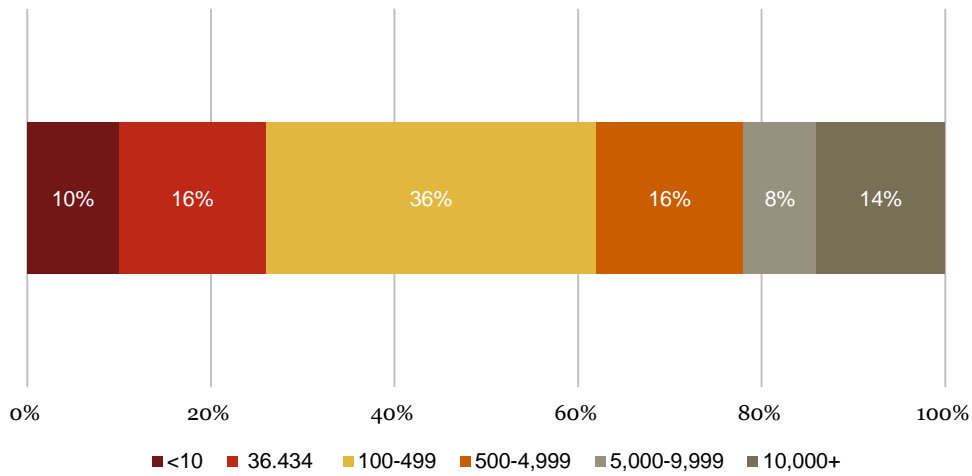


Figure 25 – Company size

We have interviewed different organizations and professionals across the sector; from CEOs and vice presidents to technical directors and fleet attendants. However, during our interviews we noticed that executives are, in general, more optimistic towards LNG, whereas the technical managers are better informed and have stronger opinions on this topic.

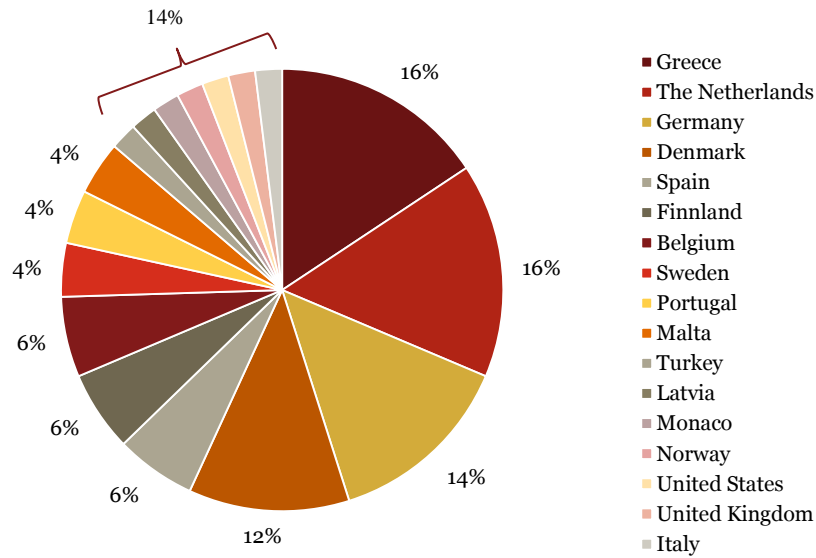


Figure 26 – Survey respondents per country

4.8. Proposed policy measures

To increase LNG uptake and stimulate more positive effects, some survey respondents mentioned the following:

- Increase likelihood and uptake by combining LNG as a shipping fuel with other LNG uses (e.g. trucks, remote power generation, off grid, applications etc.).
- Increase infrastructure development, especially in bunker delivery ships. A case in Singapore was mentioned where the government promised a subsidy of \$2 million per vessel for up to 6 ships.
- Stimulate the use of low-emission vessels through tax incentives (i.e. similar to low-emission car incentives); stronger incentives for clean ships may enforce a quicker uptake (like the Norwegian NOx fund).
- Enforce stronger emission limits on EU and global level. At the moment, many emission agreements are pushed to the future.
- Regulatory pressure and infrastructure availability are key to the first stage. For massive utilization of LNG as a marine fuel, pricing and economic advantages for shipowners are a key condition.
- Promote partnerships/cooperation between key market players to ensure a faster adoption of the technology.

5. The communication concept

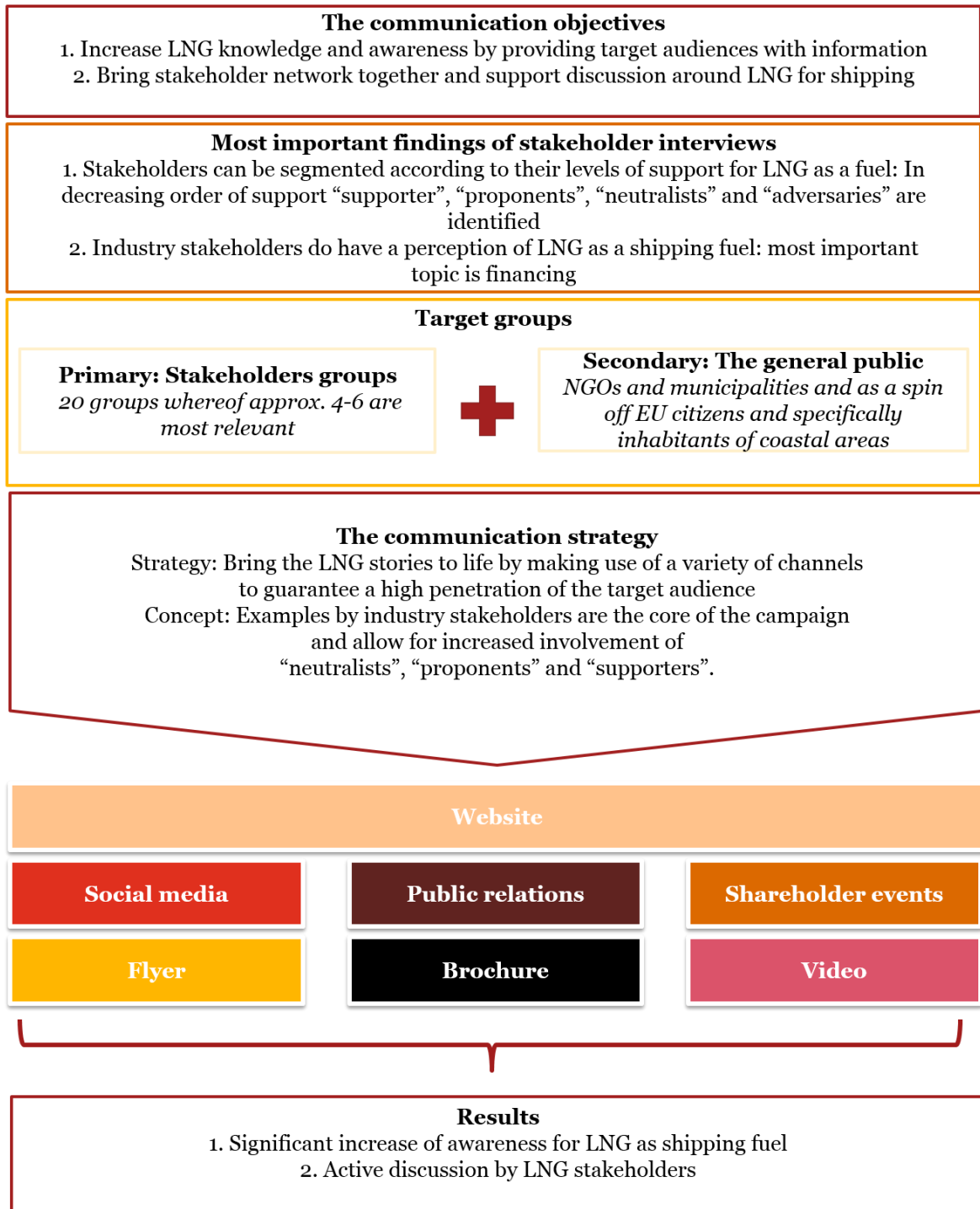


Figure 27 – The communication concept

5.1. Stakeholders as the main target group

As a result of the stakeholder analysis conducted in the first part of the project, we find that there are differences within the relevant stakeholder groups concerning their awareness, attitude and engagement towards LNG as a shipping fuel. The stakeholder groups are:

- Government and policy makers (including representatives of EU Member States responsible for shipping)
- Local maritime transport authorities in the EU Member States, municipalities in coastal areas
- Port authorities
- Research institutions
- Classification societies
- NGOs, including environmental organizations
- Shipbuilders
- Gas suppliers
- Terminal operators
- Service suppliers
- Industry associations, especially (but not exclusively) in the areas of shipping, gas, energy infrastructure, ports
- Investors and financial institutions

In order to successfully target all stakeholders, we identified and quantified four clusters with common attributes: supporters, proponents, neutralists and adversaries. The stakeholders were categorized in the clusters according to

- **Attitude** – supportiveness of LNG as shipping fuel and optimism of adoption
- **Awareness** – knowledge level and use of knowledge
- **Engagement** – activities, partnerships, initiatives, etc.

It is important to highlight that within certain stakeholder groups differences in opinion exist. Therefore certain stakeholders were categorized in more than one cluster, as can be seen in the following figure.

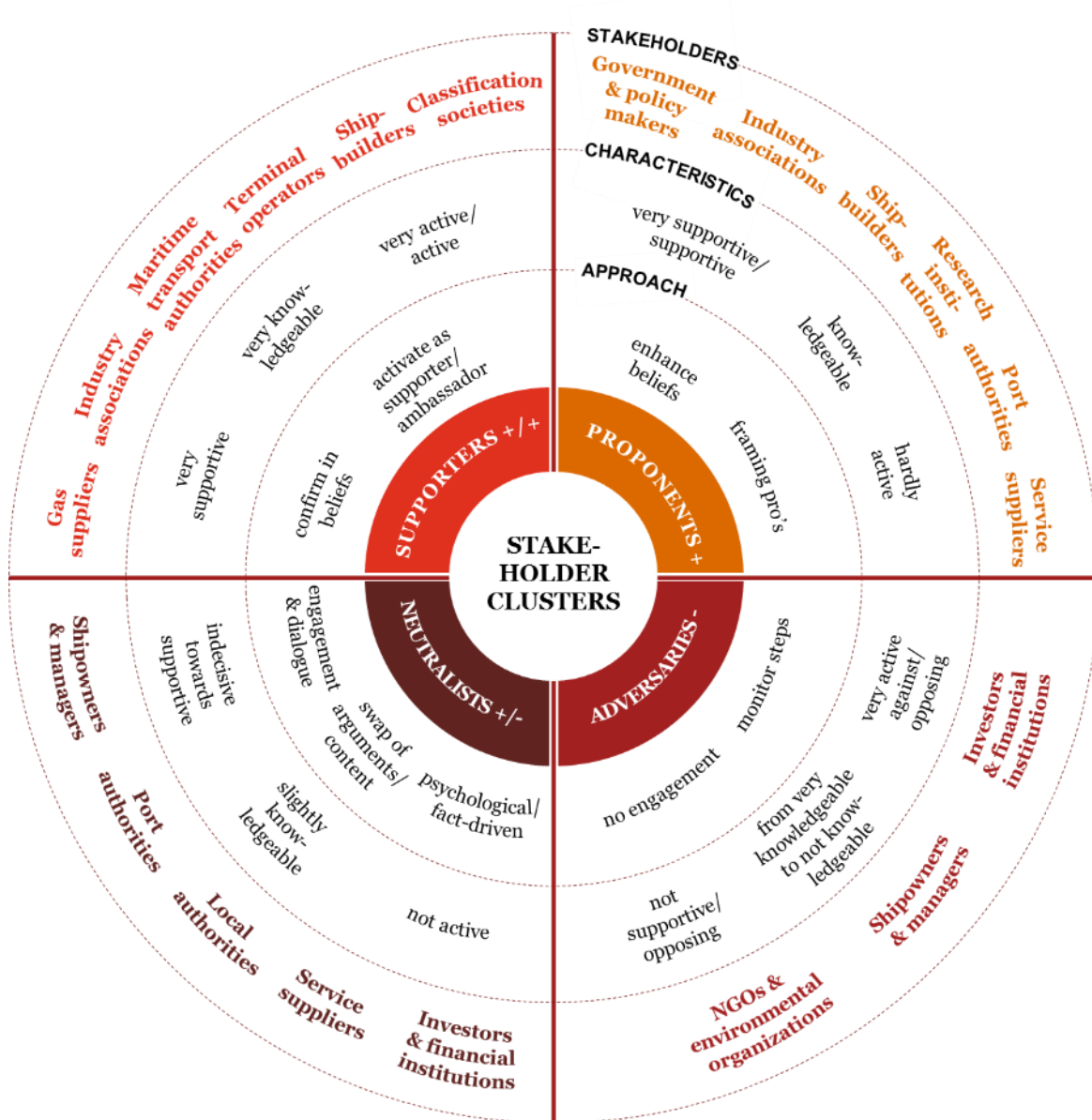


Figure 28 – Stakeholder clustering

Stakeholders gap analysis and approach

The segmentation of four clusters enabled us to identify gaps in the current and desired state when it comes to LNG as a shipping fuel. From these insights we defined which factual and emotional barriers we have to take away in order to create at least a neutral attitude, and possibly a positive and constructive attitude towards LNG as a shipping fuel.

Based on the gaps of the clusters we formulated our campaign approach. Supporters were confirmed in their beliefs and activated as supporters/ambassadors. Proponents were enhanced in their beliefs as well as framed with the pros of LNG as a shipping fuel. The neutralists were actively engaged in a dialogue which was psychological and fact-driven. Concerning adversaries took a reactive stance, which saw little engagement, but therefore more monitoring.

Supporters ++		Proponents +	
<i>Target group specifics</i>	<i>Approach during campaign</i>	<i>Target group specifics</i>	<i>Approach during campaign</i>
<ul style="list-style-type: none"> • Perceive LNG as a fuel as an ideal means to go through the sustainable energy transition: cleanest fossil fuel, compliant with ECA requirements • High level of knowledge • Willing and able to express themselves on this matter 	<ul style="list-style-type: none"> • Confirm in beliefs • Activate as supporter/ ambassador 	<ul style="list-style-type: none"> • See the advantages of LNG as a fuel, but are not yet fully convinced (obstacles in terms of knowledge, best practices, financing, negative side effects on sustainability, etc.) • Lack of concrete LNG business cases also is an obstacle • Average level of knowledge 	<ul style="list-style-type: none"> • Enhance beliefs • Framing pro's
Neutralists +/-		Adversaries -	
<i>Target group specifics</i>	<i>Approach during campaign</i>	<i>Target group specifics</i>	<i>Approach during campaign</i>
<ul style="list-style-type: none"> • Doubts on sustainability of LNG as it is a fossil fuel (is LNG as clean and sustainable as it claims?) • Little knowledge of LNG, let alone LNG as a fuel • Low awareness due to small number of concrete LNG business cases • Sustainable energy transition is not top of the agenda • Public opinion in a considerable number of member states has become fairly sceptical towards the European Union 	<ul style="list-style-type: none"> • Engagement & dialogue • Swap of arguments/ content • Psychological • Fact-driven 	<ul style="list-style-type: none"> • Oppose any claim or labelling of LNG as 'clean' or 'sustainable' • This is the case because they focus on the whole supply chain, starting from the extraction – leading to a negative view on LNG as a fuel • On top of that, opponents have serious issues with social/ labour conditions, environmental consequences and threat of terrorism / major incidents in places where LNG is extracted, refined, and stored 	<ul style="list-style-type: none"> • No engagement • Monitor steps

Figure 29 – Specific target group approaches

The campaign focused on the neutralists and proponents to create a slightly positive/neutral story about LNG. The supporters would ideally influence the other groups by spreading their positive stories. Our main campaign concept was based on experiences from various parties (also across Europe) within the industry. By using this approach the message of the campaign was received as a reliable and neutral message.

Where possible, the campaign was tailored to the different target groups: there are specific content and special sections on the website and in the brochure directed towards particular stakeholder groups. Some of the events were focused on certain industry segments: e.g. the event in London focused on the financial aspects of LNG for Shipping, the event in Piraeus focused on the needs of shipowners, the event in Hamburg focused on ports.

A slight refining of the target group for the awareness campaign during the project was necessary: contrary to the initial tender document and project planning, it was agreed that the current project set-up (and campaign budget) cannot realistically reach the general public within the European Union. It was agreed that there wouldn't be a separate public campaign. Some elements of the campaign (e.g. the website and information material offered on the website) were made available to the public, but the public would not be addressed as a particular target group.

Furthermore, selected NGOs and public authorities (partially representing the public opinion) were invited to the stakeholder events.

6. Elements of the communication campaign

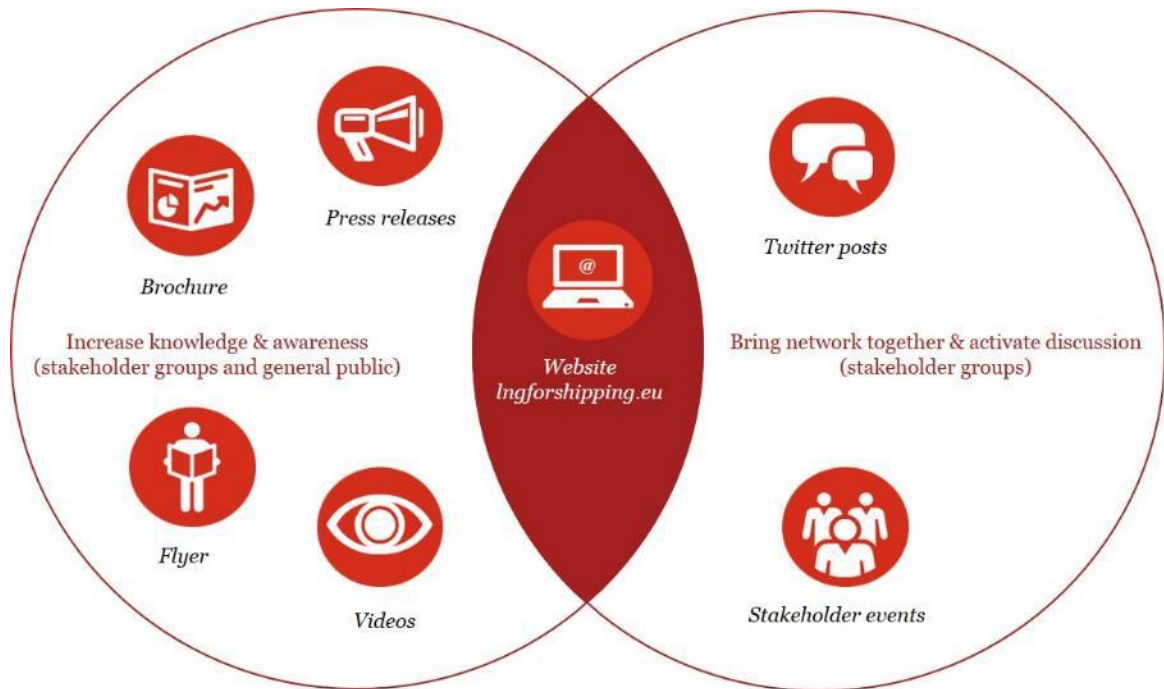


Figure 30 – Campaign elements of “LNG for Shipping”

The campaign consisted of seven elements as presented in figure 27: press releases, a brochure, a flyer, videos, Twitter posts, stakeholder events and the website. By making use of different communication channels, a high attention among the relevant stakeholder groups was achieved. Moreover, for all campaign elements, monitoring was done to ensure the reporting of the desired outcomes and successes. However, for some elements like the flyer and brochure we only reported on the number of hand-outs to visitors of our events, while the website was monitored more closely via a real-time analytics tool. The effect of the events was estimated by tracking the participation rates and the results of the short survey distributed to participants.

Chapter 7 provides details on the methodology of campaign monitoring, the campaign instruments, the result of the campaign and the deliverables.

In the following, the different campaign instruments are introduced.

6.1. Website

We created an open interactive website providing the relevant information on LNG in shipping for the public target groups, arranged according to the specific interest of the visitor (public, local government, etc.). The navigation and user interface guides visitors directly towards their segment of interest. In this way, we are able to provide specific access to the portal and specific information for specific target groups (depending on target group needs).

The website includes:

- Information on the "LNG for Shipping" initiative
- General introduction on LNG for Shipping
- More detailed information on LNG for shipping for certain target groups (e.g. shipping companies, port authorities, EU citizens)
- Calendar of events
- Relevant points of contact

The internet platform was the heart of the campaign. It served as a source of information for all stakeholders and the general public. It gave a very broad overview of the topic so that the very different stakeholder interests (e.g. technology, financing, standards, etc.) could equally be served.

The website was set up on a separate domain (www.lngforshipping.eu).

The website is a solid platform of information about LNG for Shipping.

Target groups	<ul style="list-style-type: none"> ▪ General public, Stakeholders groups
Goals	<ul style="list-style-type: none"> ▪ Inform target groups by providing objective information on LNG ▪ Drive traffic to target group-specific channels or information such as social media and events
Description	<ul style="list-style-type: none"> ▪ Main platform of information ▪ Added button "Keep me updated" to gather e-mail addresses of interested visitors ▪ Multi-device-compatible website with understandable information and news about LNG and the campaign
Deliverables	<ul style="list-style-type: none"> ▪ Create a website ▪ Add news and new content throughout campaign ▪ Gather statistics and insights on visitors to website

LNG FOR SHIPPING

LNG has become a proven and available fuel option. However, stakeholders are still in a quest to find attractive business cases. This platform is an initiative of the European Commission to share research and information, raise awareness and connect stakeholders within the shipping industry.

LNG: an attractive alternative fuel for shipping

LNG FOR SHIPPING

Apart from being a very important source of energy for the power industry (see LNG is green), LNG is also a viable and attractive fuel for ships. It is an answer to future challenges (especially with respect to environmental protection), but there ...

[READ MORE](#)

ABOUT THIS PLATFORM

This platform gives you a comprehensive overview: it informs about the technology, the financing, the laws & regulation and other opportunities and barriers with respect to LNG as a shipping fuel. It also informs about ongoing initiatives and events concerning ...

[READ MORE](#)

EVENTS

From March to June 2016 the European Commission will host a series of stakeholder events where the possibilities and challenges of LNG will be discussed. Please register and find more information about the events on this website. Our next event ...

[READ MORE](#)

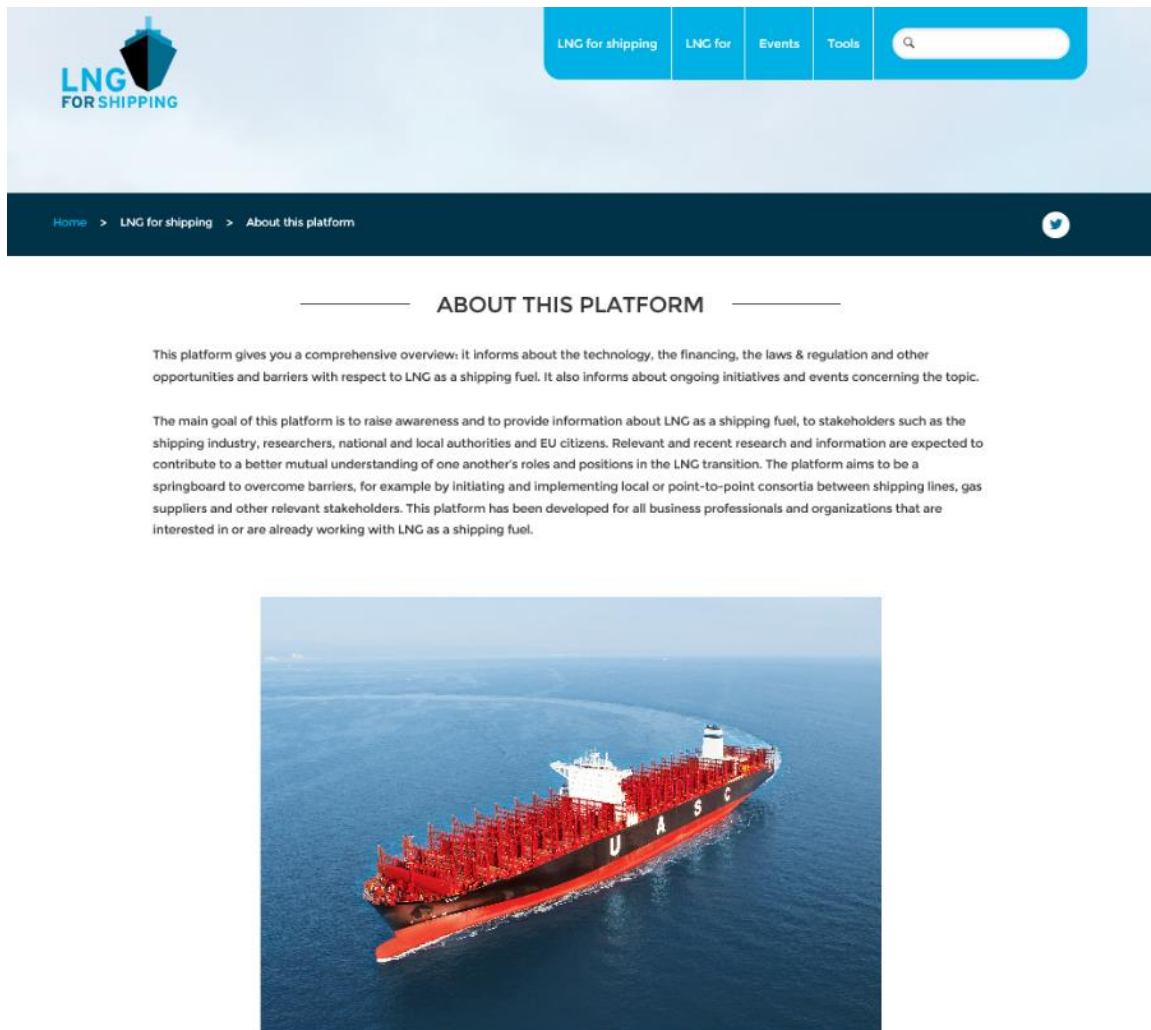


Figure 31 – Screenshots of website LNGforShipping.eu

6.2. Social Media/Twitter

Social media represented a crucial asset to drive the relevant discussion on LNG for Shipping.

The objective of including social media in the campaign was to inform the target audience with content about LNG, but also to initiate and facilitate discussions with industry experts via the Twitter channel. It was a way to stay in dialogue with stakeholders who voice their opinions on LNG as a shipping fuel.

A selection of tweets related to the LNG for Shipping campaign can be found in Appendix **Error! Reference source not found.** (Tweets on LNG for Shipping February–June 2015).

Target groups	<ul style="list-style-type: none"> ▪ Stakeholder groups
Goals	<ul style="list-style-type: none"> ▪ Inform target audience with content about LNG ▪ Start and facilitate discussion among industry experts ▪ Bring network together
Description	<ul style="list-style-type: none"> ▪ Create visibility on platforms where our target groups are most

	<p>active and thus likely to be reached</p> <ul style="list-style-type: none"> ▪ Initiate a valuable discussion on relevant LNG topics such as financing ▪ Use the existing channels of DG MOVE, mainly the Twitter account ▪ Get to know their thoughts and ideas
Deliverables	<ul style="list-style-type: none"> ▪ Content calendar including planning and 54 messages (18 weeks, approx. 3 posts per week) ▪ Regular calendar updates provided, such as the timing of posts around events/videos
KPIs	<ul style="list-style-type: none"> ▪ Increase of followers ▪ Traffic via Twitter to website/campaign platform

6.3. Stakeholder events

6.3.1. Purpose and set-up of events

The events across Europe were at the core of the stakeholder campaign we conducted. Medium-sized events – with approx. 10–50 people – are an ideal format to convey information to a larger group but to still allow a personal interaction between presenters and audience. In retrospect, the events were very well appreciated and had an important positive effect on the awareness regarding LNG as a shipping fuel.

From the start, we planned to reach out as much as possible across Europe. The choice of locations (Brussels, London, Hamburg, Amsterdam and Piraeus) allowed us to reach a broad audience in Europe.

For most events we directly or indirectly related to other existing events or activities – for example, the kick-off event in Brussels took place during the European Shipping Week. Our event in Amsterdam was a panel discussion placed in the program of a commercial conference on small-scale LNG. This helped us to get sufficient attention and participation for our events.

The following figure shows the locations and dates of events we organized in the course of this project.



Figure 32 – Map of Europe with the events

At both events in Brussels, the other lots of the program (March 3: Lot 1; June 15: Lot 1 and Lot 3) were invited to join and share their project results.

At all events we arranged sufficient time for personal networking.

Target groups	<ul style="list-style-type: none"> ▪ Stakeholder groups
Goals	<ul style="list-style-type: none"> ▪ Facilitate platform to discuss main issues around LNG and exchange thoughts and point of views ▪ Bring network together ▪ Build a relationship with stakeholders
Description	<ul style="list-style-type: none"> ▪ Instead of organizing even more events, tap into existing events where EC can activate the discussion or fuel the stakeholders with insights. We host round-table debates ▪ Initial scope: "Round tables" of max. 10–15 people per event. In the course of the project, the event size increased to 15–60 participants per event. ▪ Host online discussion with stakeholders on the existing DG MOVE channels (included in social media calendar) ▪ Use updates and outcome from the events as social media content (videos, images, key notes, quotes)
Deliverables	<ul style="list-style-type: none"> ▪ 5 events throughout Europe ▪ Content for social media
KPIs	<ul style="list-style-type: none"> ▪ Amount of people attending events ▪ Posts to discussion

European Commission
 Study on the completion of an EU framework on LNG-fuelled ships and its relevant fuel provision
 infrastructure - LOT 2 "Creating Awareness on LNG Risks and Opportunities"

The following photos give an impression of the setting of the stakeholder events.



Sandro Santamato (DG MOVE)



Dr. Axel von Perfall (DG MOVE)



Dr. Axel von Perfall (PwC)



Jens P. Buchhave (Terntank)



Rob van der Spek (DNV-GL)



Figure 33 – Selected photos from the stakeholder events

6.3.2. Kick-off in Brussels, March 3, 2015

The European Shipping Week took place between March 2 and 6 in Brussels and featured several topics and presentations about the shipping industry. It is a platform to facilitate discussion between policy makers from main EU institutions, European shipowners and other related stakeholders. The European Shipping Week is organized by the European Community Shipowners' Association (ECSA). ECSA fully supports this campaign and its kick-off. In particular, ECSA announced the kick-off event in its publications.

The kick-off event of the campaign "LNG for Shipping" took place on March 3 at the five-star hotel Le Plaza in Brussels. This high-quality, highly representative venue was an ideal setting for the campaign. Additionally, it was one of the main venues for the European Shipping Week, which gave the event and the campaign even more attention.



LNG FOR SHIPPING: RISKS AND OPPORTUNITIES

The European Commission has launched a study on the perception of the risks and opportunities of LNG as a shipping fuel. You are cordially invited to discuss with us the preliminary findings on March 3rd, 10.00 – 14.00 hours in Brussels.

The event takes place during the European Shipping Week in Brussels, which is held from March 2-6. The European Commission's Directorate-General for Mobility and Transport (DG MOVE), PwC and DNV-GL are conducting an analysis and evaluation of the gaps that exist in the regulatory framework for LNG-fuelled ships and the provision of LNG fuel. The research is focusing on risks and opportunities of using LNG as a shipping fuel.

PROGRAM

Part 1: Insights from the European Commission's study on LNG as a shipping fuel

- 10.00 – 10.10 Introduction by Sandro Santamato, Head of Unit Maritime transport & logistic, European Commission
- 10.10 – 10.30 Insights from PwC and DNV-GL stakeholder research by Rob van der Spek, DNV-GL
- 10.30 – 10.40 Presentation of the campaign by Axel von Perfall, PwC
- 10.40 – 11.00 Industry key note speech by Jens P. Buchhave, Managing Director of Terntank Rederi A/S
- 11.00 – 12.00 Discussion and round up by Rob van der Spek and Axel von Perfall
- 12.00 – 12.15 Sandwich lunch

Part 2: Gap analysis of the technical and legal framework on LNG in the European Union

- 12.15 – 12.30 Introduction to the scope of the study by Maarten Bekaert, DNV-GL
- 12.30 – 13.15 Presentation of the preliminary findings of the study by Sofie Van Volsem, DNV-GL
- 13.15 – 14.00 Discussion and round-up by Sofie Van Volsem and Maarten Bekaert

PRACTICAL INFORMATION

Date and time: March 3rd 2015
10.00 – 14.00 hours
European Shipping Week
Location: Hotel Le Plaza Brussels
Boulevard Adolphe Max 118-126
1000 Brussels, Belgium

REGISTRATION

Please register by sending an e-mail to Maria Gomes (Maria.Gomes@dnvgl.com). Please specify whether you will attend Part 1, Part 2 or both.



Figure 34 – Agenda kick-off in Brussels

The event was held in combination with the stakeholder event planned in Lot 1 of this project. Lot 2 presented the stakeholder research and the communication campaign from 10 am to 12 noon. After a short lunch break, Lot 1 continued with the stakeholder event until 2 pm. Both events were announced jointly; a combined invitation was used (see Appendix). The meeting room and technical facilities were shared.

We counted approximately 45 participants of this meeting. Most of the participants were representative of organizations related to shipping (e.g. Royal Belgian Shipowners Association, Port of Zeebrugge) and sustainability (e.g. Belgian Ministry of Environment and Energy). There were also several journalists; some of them published on the event later on.

The introduction by the European Commission was made by Sandro Santamato of DG MOVE. He confirmed the importance of LNG as one of the very viable and attractive fuel options for the shipping industry in the future. He also gave an overview of the activities of the European Commission to support the development of this propulsion technology, e.g. by supporting project funding (e.g. the Trans-European Transport Network (TEN-T)) and organizing specialized forums for knowledge exchange (e.g. the European Short Sea Shipping Forum (ESSF)).

In the following, Rob van der Spek of DNV-GL gave an overview of the project and presented the preliminary results of the stakeholder analysis which had been conducted in the previous months.

Axel von Perfall of PwC presented the awareness campaign which was to be kicked off with this event in Brussels. He introduced the available campaign elements (e.g. website, flyer, brochure, video) to the participants.

The industry key note speaker was held by Jens P. Buchhave, Managing Director of Terntank Rederi A/S (<http://www.terntank.com>), a Danish shipping company that has ordered 4 LNG-powered ships and has found a good way to solve the "chicken-and-egg" problem with the other stakeholders.

Lot 1 – represented by Sofie van Volsem and Maarten Bekaert of DNV/GL – presented the preliminary findings of the study on the gap analysis of the technical and legal framework on LNG in Europe.

The event was well received by the participants and led to various reactions in the media – more details can be found in chapter 7.2.3.

6.3.3. London, May 13, 2015

The event took place in parallel to the IMO (International Maritime Organization) Marine Environment Protection Committee between May 11 and 15, 2015. We chose the Novotel Hotel Waterloo Hotel for its proximity to the IMO. The workshop was preceded by a welcome coffee and followed by a joint dinner in the hotel.

The event was organized in cooperation with the International Association of Ports and Harbors (IAPH) and the Society for Gas as a Marine Fuel (SGMF). Both organizations were involved in the preparing the event and inviting experts to the event.

The focus of the event was on financial and funding cases around LNG. Approximately 50 participants joined the event. The participants came from a broad range of organizations and companies: international organizations (e.g. IMO, German Shipowners Association SIGTTO), port authorities (e.g. Port of Mannheim), gas suppliers (e.g. Shell) and engine manufacturers (e.g. MAN).





LNG FOR SHIPPING: A PROFITABLE BUSINESS CASE

The European Commission has launched a study on the perception of the risks and opportunities for LNG in shipping. You are cordially invited to discuss with us the preliminary results of this study and the financial implication of the oil price on the attractiveness of LNG as a fuel.

The event takes place during the IMO Marine Environment Protection Committee, which is held from May 11 to 15. The European Commission's Directorate-General for Mobility and Transport (DG MOVE), supported by PricewaterhouseCoopers and DNV-GL, is conducting an analysis and evaluation of the gaps that exist in the regulatory framework for LNG-fuelled ships and the provision of LNG fuel. The research is focusing on risks and opportunities of using LNG as a shipping fuel.

PROGRAM

- 5:45 - 6:15 PM Arrival and registration
- 6:15 - 6:30 PM Introduction by Richard Mason, Accredited Representative of the European Commission to the IMO, DG MOVE
- 6:30 - 7:00 PM Insights from PwC and DNV-GL stakeholder research & presentation of the campaign by Axel von Perfall, PwC
- 7:00 - 7:30 PM "Implication of the oil price on the attractiveness of LNG as a fuel" by Erik Skramstad, Vice President DNV-GL, LNG Segment
- 7:30 - 8:00 PM Discussion and round up by Axel von Perfall, PwC
- 8:00 - 9:00 PM Dinner Buffet

Contact for enquiries: Axel von Perfall,
 axel.von.perfall@de.pwc.com +49 151 26817261

PRACTICAL INFORMATION

Date and time: May 13th 2015
 5:45 - 9:00 PM

Location: **Hotel Novotel Waterloo London**
 113 Lambeth Road
 London

An initiative of the 

supported by  

Figure 35 – London Program, May 13, 2015

Apart from linking the event to the above-mentioned conference, our event in London focused on stakeholders from the financial community. As the financing of LNG as a fuel is one of the significant barriers to the further uptake of this technology, potential

financers should be made aware of the benefits and current state of the art of LNG as a shipping fuel.

The introduction to the event was held by Richard Mason, the Representative of the European Commission to the IMO. He outlined the scope and objective of the project, highlighted the ambition of the European Commission regarding sustainable shipping and presented selected activities of the EC in this field (e.g. TEN-T funding, ESSF). Axel von Perfall of PwC presented the findings of a survey conducted among stakeholders in the field of LNG for shipping (e.g. shipping companies, port authorities, gas suppliers, municipalities, etc.). He outlined the elements of the communication campaign. It was stressed that nearly all elements (e.g. website, publications) of the campaign can also be used by the stakeholders to further promote LNG as a shipping fuel.

As a case study on a specific topic, Erik Skramstad, Vice President DNV-GL, LNG Segment, presented the result of a recent study, "Implication of the oil price on the attractiveness on LNG as a fuel". The main conclusions of the study are:

- The drop in oil price has resulted in a general drop in prices for energy from natural gas, but there is still a significant price advantage for gas compared to traditional liquid fuels.
- The legislation and emission controls are expanding and entering new areas.
- All new ships need to be prepared to enter areas where emission controls are implemented.
- Additional investments are needed (LNG, scrubbers, SCR¹⁰) which need to be depreciated over the lifetime of the ship. Experience shows that price fluctuations have a fairly short duration.
- LNG-fuelled vessels with dual fuel machinery are an attractive option, satisfying legislative requirements in emission control areas, and offering the possibility to use the cheapest energy (natural gas or oil) during ocean crossings.
- It is concluded that there are no indications that the current low oil price will have a long-term negative impact on the deployment of LNG as a fuel.

The overall feedback to the event, as can be judged by the feedback forms, was very positive (see also section 7.2.4 Stakeholder events).

6.3.4. Piraeus, May 28, 2015

The European Maritime Day Conference, organized and sponsored by the European Commission (DG MARE), was held at the Peace and Friendship Stadium in Piraeus (Athens) on May 28 and 29, 2015. The conference focused on topics relevant for ports and coasts as engines for Blue Growth covering Southern Europe and the Mediterranean.

It brought together over 1300 participants to discuss the potential of the blue economy. For further information please see:
<http://ec.europa.eu/maritimeaffairs/maritimeday/en>.

As part of the LNG Awareness Campaign a workshop was held with the title "LNG for Shipping: Risks and Opportunities". Approximately 60 guests attended the workshop, which was held for an hour and a half. Chairs of the workshop were Erdem Erginel (EC DG MOVE) and Antonius Willms (PwC). Speakers of the workshop were Antonius Willms

¹⁰ Selective catalytic reduction

(PwC), presenting insights from the PwC and DNV-GL stakeholder research; Richard Gilmore (Maran Gas Maritime Inc.), presenting the topic of LNG as a shipping fuel of the future from the perspective of a shipowning company; Mario Dogliani (RINA), presenting the status of the TEN-T Project COSTA; and Panayotis Zacharioudakis (OceanFinance Ltd.) presenting the status and plans of the COSTA follow-up project Poseidon Med.

The three key messages of the workshop were the following:

- The EU supports the use of LNG as a shipping fuel and supports many initiatives through for example the TEN-T Program, the Connecting Europe Facility (CEF), and also through the study on the completion of an EU framework on LNG-fuelled ships and its relevant fuel provision infrastructure.
- LNG is a viable alternative as shipping fuel as it is compliant with current and future emission regulations and has economic benefits such as new business opportunities, job creation, etc.
- The main barrier regarding the further implementation of LNG as a shipping fuel is the uncertainty of the financial context, which leads to difficulties in calculating positive business models.

The workshop was further concluded in a discussion round. The main topics of discussion were the business cases around LNG as a shipping fuel (including the need for financing), issues of training for ground personnel handling LNG and the discussion around facts and myths of LNG safety issues. In the discussion all speakers were directly involved in answering the questions and the debates concluded on a very positive note.

LNG FOR SHIPPING

**INVITATION
 LNG FOR SHIPPING
 PIRAEUS, MAY 28th 2015**

**LNG FOR SHIPPING:
 RISKS AND OPPORTUNITIES**

The current EU legislation puts tighter limits on emissions of seagoing vessels in European waters. Emissions Control Areas (ECAs) force the operators of vessels to use propulsion systems that result in lower emissions. One of the possible solutions is the use of LNG as a shipping fuel.

The European Commission's Directorate-General for Mobility and Transport (DG MOVE), supported by PriceWaterhouseCoopers and DNV-GL, has launched a study on the perception of the risks and opportunities of LNG as a shipping fuel and on the gaps that exist in the regulatory framework for LNG-fuelled ships and the provision of LNG fuel.

You are cordially invited to discuss with us the preliminary results of this study. The workshop will take place during the European Maritime Day 2015, which will be held in Piraeus on 28-29 May 2015.

PROGRAM

11:00-11:10 AM	<i>Introduction by Erdem Erginel, Representative of the European Commission, DG MOVE</i>
11:10-11:20 AM	<i>Insights from PwC and DNV-GL stakeholder research & presentation of the campaign by Antonius Willms, PwC</i>
11:20-11:40 AM	<i>LNG, the Shipping Fuel of the Future by Stavros Hatzigrigoris, Managing Director of Maran Gas Maritime Inc.</i>
11:40-12:00 AM	<i>Status Report on TEN-T Project COSTA by Mario Dogliani, RINA</i>
12:00-12:10 AM	<i>Poseidon Med: The LNG Bunkering Project for the East Mediterranean Sea by Dr. Panayotis Zacharioudakis, Director of OceanFinance Ltd.</i>
12:10-12:30 AM	<i>Discussion and Round Up by Erdem Erginel, Representative of the European Commission, DG MOVE</i>
12:30 AM	<i>Lunch Buffet</i>

Contact for enquiries: **Axel von Perfall**,
 axel.von.perfall@de.pwc.com +49 151 26817261

PRACTICAL INFORMATION

Date and time: May 28th 2015
 11:00 - 12:30 AM

Location: Athens Concert Hall
 (Megaron Mousikis) MC 3.3
 Piraeus, Athens, Greece

An initiative of the European Commission

Figure 36 – Invitation with updated program for Piraeus, May 28, 2015

6.3.5. Hamburg, June 4, 2015

The event in Hamburg was held at the IAPH World Ports Conference in Hamburg between June 1 and 5, 2015. The IAPH Ports Conference is an international conference organized by the International Association of Ports and Harbors (IAPH). This year's conference in Hamburg focused on the following topics:

- smartPORT logistics – challenges and possible solutions
- smartPORT energy – challenges and possible solutions
- Law and global trade – trends and challenges

Within the topic "smartPORT energy" we were able to hold a workshop titled "LNG for Shipping: Risks and Opportunities". The workshop took place in the Conference Center Hamburg (CCH) in parallel to the regular conference program.

Workshops



LNG for Shipping: Risks and Opportunities

The European Commission has launched a study on the perception of the risks and opportunities of LNG as a shipping fuel. You are cordially invited to discuss with us the preliminary findings. [Please find the agenda here.](#)

09.30 – 12.00, Hall 7, CCH

Figure 37 – Announcement of our event on the IAPH website¹¹

The workshop we organized followed a similar agenda as our other events: introduction by European Commission, presentation of the stakeholder research study and practical case studies:

¹¹ <https://www.iaph2015.org/conference/conference-programme/thursday/>



LNG FOR SHIPPING: RISKS AND OPPORTUNITIES

The current EU legislation puts tighter limits on emissions of seagoing vessels in European waters. Emissions Control Areas (ECAs) force the operators of vessels to use propulsion systems that result in lower emissions. One of the possible solutions is the use of LNG as a shipping fuel.

The European Commission's Directorate-General for Mobility and Transport (DG MOVE), supported by PriceWaterhouseCoopers and DNV-GL, has launched a study on the perception of the risks and opportunities of LNG as a shipping fuel and on the gaps that exist in the regulatory framework for LNG-fuelled ships and the provision of LNG fuel.

You are cordially invited to discuss with us the preliminary results of this study. The workshop will take place during the IAPH World Ports Conference, which will be held in Hamburg on June 1-5, 2015.

PROGRAM

- 09:30 - 10:00 Welcome and Registration
- 10:00 - 10:10 Patrick Norroy, European Commission, Directorate-General for Mobility and Transport (DG MOVE): **Welcome Note**
- 10:10 - 10:30 Dr. Axel von Perfall, PricewaterhouseCoopers, **Preliminary Survey Results**
- 10:30 - 11:00 Günter Eiermann, Bomin Linde LNG: **LNG as Shipping Fuel In Practice**
- 11:00 - 11:30 Max Kommorowski, Becker Marine Systems and Georg Ehrmann, German Maritime LNG Platform, **Case Study LNG Hybrid Barge**
- 11:30 - 12:00 Q & A and discussion
- 12:00: Lunch in the conference area.

Access to the venue requires an IAPH Ports Conference ticket. A limited number of entrance tickets for free access to our workshop is available.

Please contact Axel von Perfall, axel.von.perfall@de.pwc.com +49 151 26817261 for registration and more information.

PRACTICAL INFORMATION

Date and time: June 4th 2015
9:30 - 12:00 AM
Location: Congress Center Hamburg
Conference Hall 7
www.cch.de



Figure 38 – Hamburg Program, June 4, 2015

For the event in Hamburg, the introduction by the European Commission was made by Patrick Norroy of DG MOVE. He confirmed the importance of LNG as one of the very viable and attractive fuel options for the shipping industry in the future. He also gave an overview of the activities of the European Commission to support the development of this propulsion technology, e.g. by supporting project funding (e.g. TEN-T) and organizing specialized forums for knowledge exchange (e.g. ESSF).

Following this, Axel von Perfall, project coordinator of Lot 2, gave an overview of the project and presented the results of the stakeholder analysis which was conducted in the first part of this project. He also introduced the available campaign elements (e.g. website, flyer, brochure, video) to the participants.

In Hamburg, we invited two speakers from the industry to demonstrate their activities in LNG for Shipping:

Günter Eiermann of Bomin Linde presented their activities as project developer and infrastructure operator. In particular he presented the world's first LNG bunker vessel, SEAGAS, which has already completed over 600 ship-to-ship transfers. He also presented that an LNG bunker supply vessel is currently being developed to be operational from 2017 onwards at the port of Klaipeda (Lithuania). It is supposed to significantly improve the availability of LNG in the entire Baltic Sea.

Max Kommorowski of Becker Marine Systems introduced the audience to the LNG Hybrid Barge which was recently commissioned in the port of Hamburg. It uses LNG to power a power generation facility that supplies electricity to cruise ships mooring in the port. In winter time (outside the cruise ship season) the power barge can be used to support the district heating system in Hamburg. Overall this project helps to reduce emissions from shipping because cruise ships can reduce or turn off their diesel-powered auxiliary engines during times at the port.

The participants asked a couple of questions regarding the content of the presentations already during the presentations. After the event, the discussions continued individually with the participants.

6.3.6. Amsterdam, June 23, 2015

One of the events organized in the course of this project was organized as a session at a commercial conference: The Small-Mid Scale LNG Summit (<http://small-mid-lng.com/>) was hosted by the CWC Group, a commercial conference company, between June 23 and 25, 2015 in Amsterdam. The conference took place at the Hilton Amsterdam, which offered a high-profile setting for the conference. We had the opportunity to fill a slot of 45 minutes on the first day of the conference.



Figure 39 – World LNG Series: Small-Mid Scale LNG Summit announcement

The first day of the conference was visited by approximately 120 participants. Participants of the conference were mainly from the private sector and interested in LNG for maritime transport: governmental authorities, ports authorities, fuel suppliers, shipowners from the North Sea and the Baltic Sea, and LNG associations, e.g. SGMF.

The following general observations could be made from taking part in the first day of the conference:

- Participants were mainly of the opinion that the "chicken-and-egg" dilemma no longer exists, at least in Northern Europe, as the bunkering infrastructure (in small scale) is sufficient for the current demand, and there are no problems with availability of LNG.
- The demand at the moment is low but most of the participants believe that the demand will grow over the coming years.
- At this moment in time, with current volumes and fuel prices, there is no strong business case for LNG but they believe that LNG will give a competitive advantage when the price of conventional fuel grows (and it is expected to).
- LNG is a long-term solution, currently mainly for short-sea shipping (in particular in SECAs) but in the near future it should be attractive and available also for deep sea shipping, as the technology is moving forward very quickly.
- For the infrastructure investments governmental support (incentives, taxation) and financial support (EU involvement was appreciated – many projects on LNG with EU co-financing) are important but investments need to be based on market analysis.

During this Summit, Session 3 (2:00–2:45 pm) was dedicated to the insights from the LNG Study, Lot2 (this was the last of the series of 6 events organized as a part of the awareness-raising campaign under Lot2 of the LNG Study). The agenda and the external speaker were coordinated and organized by the project team.

14:00 – 14:45

3: LNG for Shipping: Insights from the European Commission's Study on LNG as a Shipping Fuel

- What is the view of the European Commission (DG MOVE) on LNG as a shipping fuel?
- What is the current perception of the various stakeholder groups on the opportunities and barriers of LNG as shipping fuel?
- What are the main conclusions from the stakeholder survey?
- What type of information material is provided to create awareness on LNG as a fuel?
- Which practical experience can be shared by a company that has engaged in LNG as shipping fuel?

Moderator: David Ledesma, Independent Consultant, South-Court Ltd

Agnieszka Zaplatka, Policy Officer, DG Mobility and Transport, European Commission

Axel von Perfall, Senior Manager- Energy Infrastructure, Public Sector, PricewaterhouseCoopers

Manon Baartmans, Commercial Manager, Port of Moerdijk

Figure 40 – Agenda session 3 on LNG for Shipping

The session was structured as follows:

- Brief introduction by David Ledesma (external moderator) (approx. 5 min) – introduction of speakers
- Opening statement by Agnieszka Zaplatka (approx. 5 min) – explained the legal background, EC actions supporting the use of LNG as a shipping fuel (LNG Study, Clean Power for Transport, Sustainable Shipping Toolbox and the ESSF)
- Presentation of stakeholder research and campaign by Axel von Perfall (PwC; project coordinator for Lot 2)(approx. 15 min)
- Presentation of LNG activities of Port of Moerdijk by Manon Baartmans (Commercial Manager, port of Moerdijk)(approx. 10 min) – case study, Port of Moerdijk (Netherlands) – GDF Suez (gas supplier) started with LNG bunkering operations at the Port of Moerdijk in December 2014. Danser Group's barge is first to bunker LNG in Moerdijk (currently the only receiver, bunkering operations – truck to ship – only once every 2 weeks). Port (being both sea and inland port) is planning to develop a complete infrastructure for LNG shipping: permanent facilities for bunkering vessels, storage facilities and delivering LNG by ship. Port of Moerdijk uses the same bunkering procedures as Port of Rotterdam (available as ports by-laws, subject to modifications if necessary).
- Q&A (approx. 15 min)

The moderator asked about the reason why the perception of LNG as a marine fuel (as presented in the study) was so positive. PwC explained that the reason might be that most of the respondents of the interview were coming from the industry, and already familiar with LNG, while there were only few replies from the public authorities who were either not familiar with LNG, or the respective organization did not have an opinion on LNG as a fuel.

DG MOVE added that the reason for this situation might be that the EU Member States require internal discussion and assessment, which is already required by the directive on alternative fuels infrastructure. A core network of refueling points for LNG at

maritime and inland ports should be available at least by the end of 2025 and 2030, respectively. Refueling points for LNG include, inter alia, LNG terminals, tanks, mobile containers, bunker vessels and barges. Member States would take the decision on the location of the LNG refueling points at ports based on a cost-benefit analysis including an examination of the environmental benefits. Most Member States have not started this process yet.

Questions from the floor were about financing instruments that may be helpful to support the marine LNG market. The NOx Fund (Norwegian experience) and exemptions from taxation (e.g. port dues) were mentioned as good examples. DG MOVE explained that all those mechanisms were analysed and discussed in the ESSF, in particular within the Sub-group on Financing, and that development of EU innovative financing mechanisms (risk-sharing mechanism) is ongoing.



Figure 41 – Pictures of the Amsterdam event, June 23, 2015

6.3.7. Closing event Brussels, June 15, 2015

Initially the event in Brussels was planned as a "closing event" for Lot 2. Due to the change in our planning, it was not actually the final event because the presentation in Amsterdam (see section 6.3.6) took place later. However, this event had a special character because it took place in the rooms of the European Commission (CCAB Conference Center Albert Borschette) and because also Lots 1 and 3 presented at the meeting. The event was scheduled purposely on the afternoon before an ESSF meeting in Brussels. Therefore many relevant stakeholders were able to participate: we counted approximately 50 participants from different stakeholder groups (especially international organizations, port authorities, equipment manufacturers). The agenda is depicted in the following figure.

Sandro Santamato of DG MOVE welcomed the participants and outlined the agenda for the meeting. He confirmed the importance of LNG as a clean fuel. He also gave an overview of the activities of the European Commission to support the development of this propulsion technology, e.g. by supporting project funding (e.g. TEN-T) and organizing specialized forums for knowledge exchange (e.g. ESSF).

In the following, Axel von Perfall, project coordinator of Lot 2 gave an overview of the project and presented the results of the stakeholder analysis which was conducted in the first part of this project. He also introduced the available campaign elements (e.g. website, flyer, brochure, video) to the participants.

As one of the external speakers, Arjan Stavast, LNG Business Development Manager at Shell, presented his company's view on LNG as a transport fuel. Shell not only takes shipping into account but also road transportation and decentralized electricity generation. Through its subsidiary Gasnor, Shell operates LNG plants, bunkering

vessels and LNG trucks in Northern Europe (mainly Norway). The GATE terminal in Rotterdam is a pillar of Shell's LNG infrastructure and the company is considering a further expansion of its activities both on the port side as well as regarding bunkering vessels.

Christian Becker of Becker Marine Systems introduced the audience to the LNG Hybrid Barge which was recently commissioned in the port of Hamburg. It uses LNG to power a power generation facility that supplies electricity to cruise ships mooring in the port. In winter time (outside the cruise ship season) the power barge can be used to support the district heating system in Hamburg. Overall this project helps to reduce emissions from shipping because cruise ships can reduce or turn off their diesel-powered auxiliary engines during times at the port.

Sofie van Volsem of DNV GL presented the findings of Lot 1 regarding the analysis and evaluation of identified gaps and remaining aspects for completing an EU-wide framework for marine LNG distribution, bunkering and use. Lot 2 reviewed the gaps identified by a previous EMSA study: only 4 of 19 gaps were actually closed in the meantime and several new gaps were identified by the study. A total of 17 recommendations were developed and detailed in the project. The overall recommendations are:

- Establish EU-wide guidance for LNG bunkering procedures
- Establish clear guideline for SIMOPS operations
- Concept of safety zones and approach to define the limits should be accounted for in bunker procedures
- Guarantee that crew training requirements for LNG-carrying or -fuelled inland vessels and barges will exist for all EU inland waterways
- Establish a comprehensive approach for methane slip management, i.e. boil-off gas, vapour management and emergency venting

The last point on the agenda was the presentation of the status of Lot 3, "Analysis of the LNG market", by Jasper Faber of CE Delft. The aim of this Lot is to provide a market overview and estimations on LNG, and to assess the hindrances that prevent a continuous deployment of LNG as a bunker fuel.



INVITATION LNG FOR SHIPPING BRUSSELS, JUNE 15th, 2015

LNG FOR SHIPPING: RISKS AND OPPORTUNITIES

The current EU legislation puts tighter limits on emissions of seagoing vessels in European waters. Emissions Control Areas (ECAs) force the operators of vessels to use propulsion systems that result in lower emissions. One of the possible solutions is the use of LNG as a shipping fuel.

The European Commission's Directorate-General for Mobility and Transport (DG MOVE),* has launched a study on the completion of an EU framework on LNG-fuelled ships and its relevant fuel provision infrastructure.

You are cordially invited to discuss with us the preliminary results of this study.

* supported by PricewaterhouseCoopers, DNV-GL, CE Delft and TNO

PRACTICAL INFORMATION

Date and time: June 15, 2015
16:00-19:00 PM
Location: Conference Center Albert Borschette,
room AB-4A
Rue Froissart 36, 1040 Brussels

We kindly ask you to register by June 11, 2015 (Thursday) at the latest at MOVE-ESSF@ec.europa.eu. Please state your name and nationality. For further questions you may contact Axel von Perfall at axel.von.perfall@de.pwc.com or +49 151 26817261.

PROGRAM

16:00-16:10 Introduction by Sandro Santamato, Head of Unit Maritime Transport & Logistics, European Commission
16:10-16:25 Brief summary of preliminary findings of Lot 2: "Stakeholder research & LNG awareness campaign" (incl. Q&A) by Axel von Perfall, PwC
16:25-17:00 Presentation of Shell's activities in LNG for shipping (incl. Q&A) by Arjan Stavast, Shell
17:00-17:35 Presentation of LNG Hybrid Barge Hamburg (incl. Q&A) by Max Kommerowski, Becker Marine Systems
17:35-18:10 Preliminary findings Lot 1 "Analysis and evaluation of identified gaps and of the remaining aspects for completing an EU-wide framework for marine LNG distribution, bunkering and use" (incl. Q&A) by Sofie Van Volsem, DNV-GL
18:10-18:45 Preliminary findings Lot 3 "Analysis of the LNG market development in the EU" (incl. Q&A) by Jasper Faber, CE Delft
18:45-19:00 Q&A, open discussion
19:00-... Buffet dinner

An initiative of the



Figure 42 – Program, Brussels closing event, June 15, 2015

6.4. Flyer

The flyer gives less-informed stakeholders a summarized version of relevant information about LNG. The information on the flyer provides answer to key questions like "What is LNG?" and "What does it entail for the shipping industry?".

It is available in print and as a PDF file. It was published on the LNGforShipping.eu website.

The flyer was handed out at all stakeholder events.

Target groups	<ul style="list-style-type: none"> ▪ Stakeholder groups ▪ General public (visitors of website)
Goals	<ul style="list-style-type: none"> ▪ Create materials that give general public a summarized version of crucial information about LNG
Description	<ul style="list-style-type: none"> ▪ Focusing on the general public as main target group ▪ Target audience is a group of people with a low level of knowledge about LNG ▪ Target group is 18+ higher-educated people ▪ Online publication that can be downloaded and/or printed ▪ 1 A4 page ▪ Information about LNG in infographic style ▪ Starting point of information is "What is LNG" and work from there on to "What is LNG for Shipping" ▪ Easy to read by using icons and images (infographic style) ▪ Distributed to relevant network that can choose to print the leaflet (at own expense) or embed on website
Deliverables	<ul style="list-style-type: none"> ▪ Leaflet ▪ Scribd account ▪ Social media content
KPIs	<ul style="list-style-type: none"> ▪ Number of viewers/readers online ▪ Number of downloads



LNG FOR SHIPPING



WHY LNG IN SHIPPING?

Stricter limitations on sulphur emissions in Emission Control Areas (ECA) will significantly reduce the industry's footprint in terms of pollution from the 1st of January 2015 onwards. When ships pass through an ECA, their fuel oil will only be allowed to contain a maximum of 0.10% sulphur (MARPOL Annex VI). Higher sulphur contents are still possible, but only if the appropriate exhaust cleaning systems are in place. One of the possible solutions to compliance is the use of LNG as propulsion fuel for shipping.

Currently, the global shipping industry's Greenhouse Gas emissions amount to around 1 billion tonnes a year. They thus account for 3% of the world's total and 4% of the EU's total emissions. By 2050, however, emissions by the shipping industry are expected to double, if no steps are taken to

reduce them. In addition, the availability of fossil fuels, their costs and energy security are matters of concern.

As a shipping fuel LNG has proved to be a serious alternative to conventional heavy and light oil fuels. LNG propelled

ships emit hardly any particulate matter, about 90% less nitrogen oxides and 20-25% less CO₂.

Now that gas engines cover a broad range of power outputs, LNG has become a proven and available fuel solution. Engine concepts include gas-only and dual-fuel four-stroke and two-stroke engines. In modern two-stroke engines methane slip (contributing to GHG) during combustion has already been practically eliminated, while in regard to four-stroke engines further reductions are expected.

PRO'S OF LNG AS A SHIPPING FUEL

- The use of LNG as a shipping fuel can reduce the emission of sulphur oxide (SO_x) by approximately 90 to 95%.
- The emission of nitrogen oxide (NO_x) can be reduced to IMO Tier III limits, applicable to ECA's from 2016. This applies to pure gas engines and four stroke dual fuel engines, which are typically used on-board vessels for short-sea and coastal shipping.
- Thanks to the lower carbon content, the use of LNG can reduce the emission of carbon dioxide (CO₂) by 20% to 25%.
- The current prices in Europe and the USA suggest that LNG can be offered at a price that compares to that of heavy fuel oil (HFO). This makes LNG a commercially attractive alternative for low-sulphur marine gas oil (MGO), which is to be used within the ECA's if no other steps are taken to reduce SO_x emissions.
- Use of LNG as fuel will reduce the NO_x emissions by approximately 90% on a lean burn gas fuelled engine.
- The SO_x and particulate matters emissions are eliminated.





PRELIMINARY FINDINGS STUDY*

Need for:

- A EU-wide guidance for LNG bunkering procedures (covering all aspects of the bunker supply process) to ensure consistency between ports and promote EU wide harmonization.
- Adoption and enforcement of a common approach via guidelines or technical specifications (e.g. ISO/DTS 16901) to address simultaneous operations (bunkering with passenger/cargo handling) in a risk assessment (QRA).
- Harmonized approach with respect to compliance to sulphur limitations with special focus on the harmonised penalty policies (and strict enough to demotivate infraction).
- Standards for small scale LNG equipment and LNG bunkering stations based on existing best practices
- Increased knowledge/experience of authorities involved in permit processes for LNG bunkering installations.

FIVE ASPECTS OF LNG

- 1. Availability**
 The availability of LNG is on the increase. Currently, LNG bunkering facilities are only available in the Nordic countries (especially Norway), the Benelux and the UK, but further bunkering facilities are planned or already under construction all across Europe.
- 2. Pricing**
 The pricing scheme for LNG fuel has not yet been fully developed. Existing contracts are predominantly index-linked to the price of oil, heavy fuel oil (HFO) or marine fuel oil (MGO – Marine Gas Oil).
- 3. Sustainability**
 LNG has significant environmental benefits and is abundantly available in many countries all over the world. This makes LNG a sustainable fuel option for the shipping industry.
- 4. Safety**
 Current LNG operations have an excellent safety track record. In order to maintain that position, the industry is building on the existing safety standards to accommodate the use of LNG as ship fuel.
- 5. Standards & Regulation**
 The IGF-code coming into force during 2015 is applicable for the receiving vessel (ship using LNG as fuel). The code allows vessels to use fuels with a low (<60°C) flashpoint, ensuring the arrangement and installation of LNG fuelled machinery to achieve an equivalent level of safety, reliability and dependability compared to conventional oil fuelled machinery. ISO/TS 18683 provides guidance for systems and installations for supply of LNG as fuel to ships ensuring that an LNG fuelled ship can refuel with a high level of safety, integrity and reliability regardless of the type of bunkering facility.

STAKEHOLDER ANALYSIS ON LNG AS A SHIPPING FUEL

The European Commission's Directorate-General for Mobility and Transport has mandated PwC and DNV-GL to analyse the current attitude towards LNG as a shipping fuel. In Q4 2014 and Q1 2015 this research has been conducted via an online questionnaire and personal interviews. Some impressions on the results:

- The compliance with ECA zone requirements and the related positive environmental effect are the major motivation for stakeholders to engage in LNG as a shipping fuel.
- Financing of LNG as a fuel and the pricing of LNG itself are among the

most critical issues for a further deployment. For many companies, esp. shipping companies, LNG does not offer a profitable business model yet: the higher equipment (engine & tank) costs are not offset by savings in fuel or operating expenses.

- The lack of a complete harmonized set of standards & regulation is perceived as an issue but the overall conviction is that the industry is on a good way and that this will not be a major barrier in the future.

- The "chicken-and-egg problem" (stakeholders pointing at each other to make the first step) remains – it can only be overcome by initiating and implementing local or point-to-point consortia between shipping lines, gas suppliers and other relevant stakeholders.

*The study that is initiated by The European's Directorate for Mobility and Transport (DG MOVE) analyses and evaluates gaps on the way to the completion of an EU regulatory framework for LNG-fuelled ships and the provision of LNG fuel.

Figure 43 – Flyer

6.5. Brochure

The brochure provides information for our target audiences. It was presented in a magazine-style publication of 16 pages. It was made available in print and as a PDF file. It was also made available on the LNGforShipping.eu website. The content included outcomes of the research study and interviews with three experts from the shipping industry. The look and feel included the right balance of visuals and text, providing the reader an easy and professional read.

Target groups	<ul style="list-style-type: none"> ▪ Stakeholder groups
Goals	<ul style="list-style-type: none"> ▪ Create materials that give industry stakeholders a summarized version of crucial information about LNG
Description	<ul style="list-style-type: none"> ▪ Magazine-style publication (16 pages) that can be downloaded and/or printed (handed out during events). ▪ Magazine entails outcome of stakeholder research, 3 interviews about business (see: Videos), timeline of the history and future of LNG and general information about the campaign ▪ Content aligned with the other publications of the campaign ▪ Magazine look and feel is very much from a "people perspective" ▪ Easy to read by using icons and images
Deliverables	<ul style="list-style-type: none"> ▪ 3 interviews (see: Videos) ▪ Scribd account ▪ Input for general information website ▪ Photography ▪ Informative brochure (online, print-ready)
KPIs	<ul style="list-style-type: none"> ▪ Number of viewers/readers online ▪ Number of downloads

6.6. Video

Videos are a very relevant means to transmit messages and to illustrate the topic we are communicating on (LNG for Shipping).

Target groups	<ul style="list-style-type: none"> ▪ Stakeholder groups ▪ General public (visitors of website)
Goals	<ul style="list-style-type: none"> ▪ Inform target groups
Description	<ul style="list-style-type: none"> ▪ Show different views on LNG as a fuel by conducting four interviews ▪ Variety of cases as well as locations throughout the EU ▪ Interview the 4 people that represent or are relevant for the business case ▪ Ask the interviewees a combination of questions that gives a balanced view on the project: why did you do it, what is your business case, what barriers did you overcome, who was in the project team etc. ▪ Use the opportunity of interviewing those 4 people for the videos as well as brochure content, social content and images ▪ Combine the interviews and some general information in a 6-minute campaign video ▪ Use the questions and answers of 30 seconds as separate content (Q&A) ▪ Upload videos on the LNG for Shipping website and on Vimeo
Deliverables	<ul style="list-style-type: none"> ▪ 4 interviews of LNG experts with camera crew and interviewer ▪ 3 video edits plus Q&A snippets
KPIs	<ul style="list-style-type: none"> ▪ Number of viewers ▪ Amount of sharing

7. Measurement of campaign effectiveness

As one of the main outcomes of this project was the creation of awareness among stakeholders regarding LNG as a shipping fuel, a clear and consistent measurement of the campaign effects was important.

This chapter provides information on how the campaign "LNG for Shipping" was monitored during the campaign period. It provides at high level the methodology, tools and metrics that were documented to assess the progress of the campaign.

The purpose of the campaign was to increase the level of awareness and understanding about the opportunities and barriers of LNG as a shipping fuel. The content for the campaign was mainly generated from the findings of the stakeholder research conducted previously.

A campaign strategy and plan was developed to provide a platform for industry stakeholders like shipowners and NGOs to initiate dialogue about LNG as a shipping fuel.

To keep track of the campaign, a regular monitoring of the campaign instruments was necessary. As there are different campaign instruments, monitoring preparations were put in place to extract campaign data and generate insights. Relevant metrics were identified to measure the effectiveness of the campaign.

7.1. Methodology

7.1.1. Barcelona Principles by AMEC

To monitor and evaluate the campaign, we used the Barcelona Principles set by the AMEC (International Association for Measurement and Evaluation of Communication¹²).

As specified below, we complied with these principles by:

- Setting clear goals and measurement: for each campaign element, we identified clear goals and measurements that were shared in the progress documents.
- Measuring the effect on outcomes was preferred to measuring output: apart from monitoring performance metrics like the number of visitors on the LNGforShipping.eu website, it was necessary to provide context. This provided a clear view on what the outcomes are of promoting LNG as a shipping fuel.
- Measuring effect on business results where possible: this was not applicable to this situation. However, in Phases 1 and 2 we have researched the status quo of awareness, attitude and behaviour towards LNG. This provides a reference point for future assessment around LNG as a shipping fuel.
- Media measurement required both quantity and quality: we combined both quantitative and qualitative measures to define the output and outcomes of the campaign. For example, we used social listening to capture the sentiment of event participants around the topic LNG as a shipping fuel, while we used web statistics to understand what the actual (real-time) interests of our audiences are.
- Advertisement value equivalency (AVE) is not the value of PR: apart from using several performance metrics, we also aimed to monitor the value of PR and the degree to which it influenced the industry. In this situation, it was essential to monitor the buzz and conversations among relevant communities.
- Measuring of social media is key: this was one of the key elements of the campaign to collect the opinion of our stakeholders. The general buzz around LNG was measured against the specific moments around the stakeholder events.
- Good measurement asks for transparency and reliability: we aimed to use the best available tools to measure the output and outcomes. All sources were documented and additional explanation was given when necessary.

Below we specify metrics for monitoring the performance of the campaign:

- Website usage – through statistics derived from the portal site
- Social media/Twitter activity and sentiment across EU territories
- Event participation and appreciation – through actively requested feedback from participants

¹² <http://amecorg.com>, presentation on Barcelona principles: <http://amecinternationalsummit.org/wp-content/uploads/2015/06/Measurement.-Its-Whats-For-Dinner-Michele-Stevens.pdf>

- PR reach – through identification of publications and media reach
- Printed materials like the flyer and brochure were reported based on the number of hand-outs
- Videos – through statistics derived from the video platform

7.1.2. Performance metrics

The effectiveness of an online campaign was commonly measured by the number of visitors of a website, redirections from affiliated sites and number of clicks through online analytics tools to calculate the performance of the campaign. By analysing these metrics, we determined the total reach of the website and rank the most popular topics by content/page. We measured the effectiveness of campaigns through media monitoring of social and other media using tools like Coosto and Google Analytics. We focused on the following performance metrics/indicators:

	Performance metrics	Remarks
Website	<ul style="list-style-type: none"> ▪ Number of visitors ▪ Time spent on site 	Live since June 2015 Analytics tool: Google Analytics
Social media	<ul style="list-style-type: none"> ▪ Number of posts, retweets, etc. ▪ Social sentiment 	Twitter posts via @Transport_EC Analytics tool: Twitter and Coosto
Public Relations	<ul style="list-style-type: none"> ▪ Number of clippings 	Only shared the press release of the kick-off event in Brussels Analytics tool: MSLGROUP tool
Stakeholder events	<ul style="list-style-type: none"> ▪ Number of people attending the event ▪ Survey results 	Measurement via event surveys
Flyer	<ul style="list-style-type: none"> ▪ Number of hard copies ▪ Number of views online 	Estimated number of distributed copies
Brochure	<ul style="list-style-type: none"> ▪ Number of views ▪ Number of downloads 	Not published yet
Videos	<ul style="list-style-type: none"> ▪ Number of views ▪ Number of shares 	Not published yet

Figure 44 – Measuring campaign effectiveness per instrument

7.2. In-depth analysis of campaign instruments

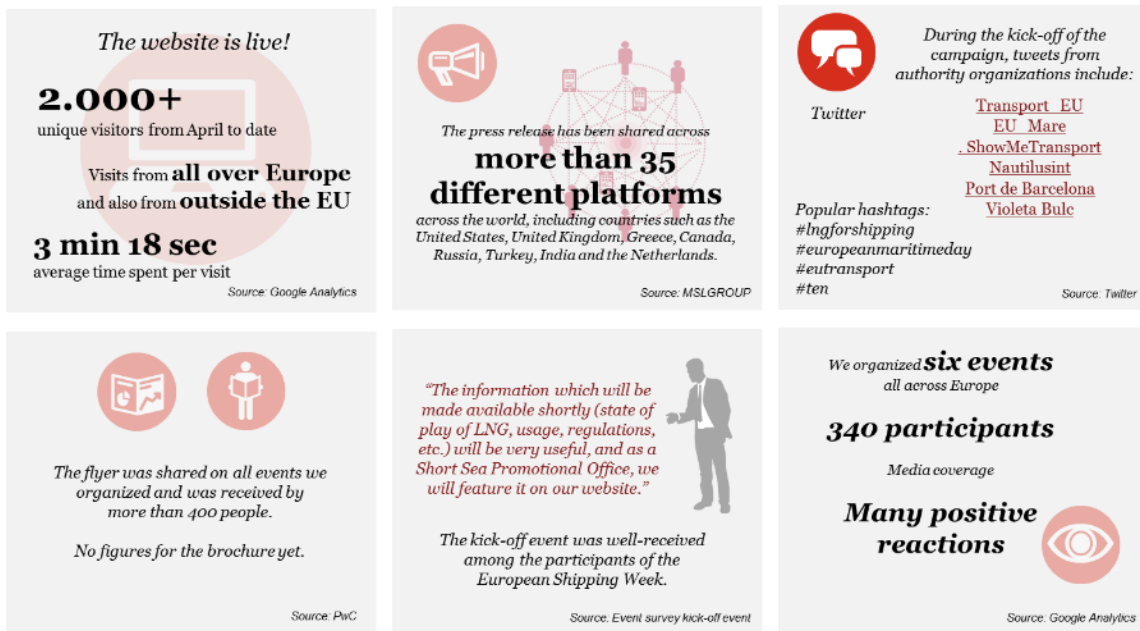


Figure 45 – Quick overview of campaign results

The figure above shows some of the key effects of the campaign. The effectiveness of the different campaign elements are analysed in the following.

7.2.1. Website

The website has been monitored since the official launch (last week of May 2015), the site traffic has been fairly consistent. However, in the past weeks we have counted a minimum of 150 sessions and a minimum of 100 users per week.

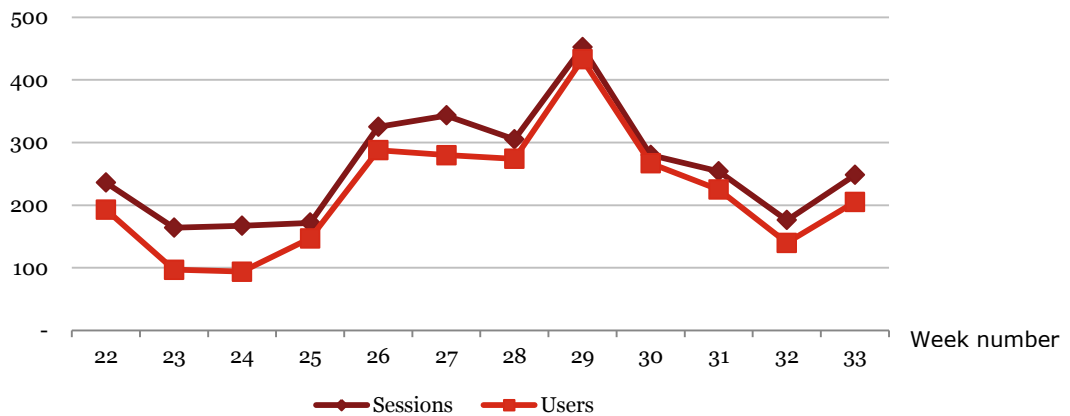


Figure 46 – LNGforShipping.eu: sessions and users per week

As the website is beginning to establish awareness, the page views and sessions still fluctuate strongly. At the moment, there are around 365 page views (average) per week. The average number of page views per session fluctuates around 1.4 pages per visit.

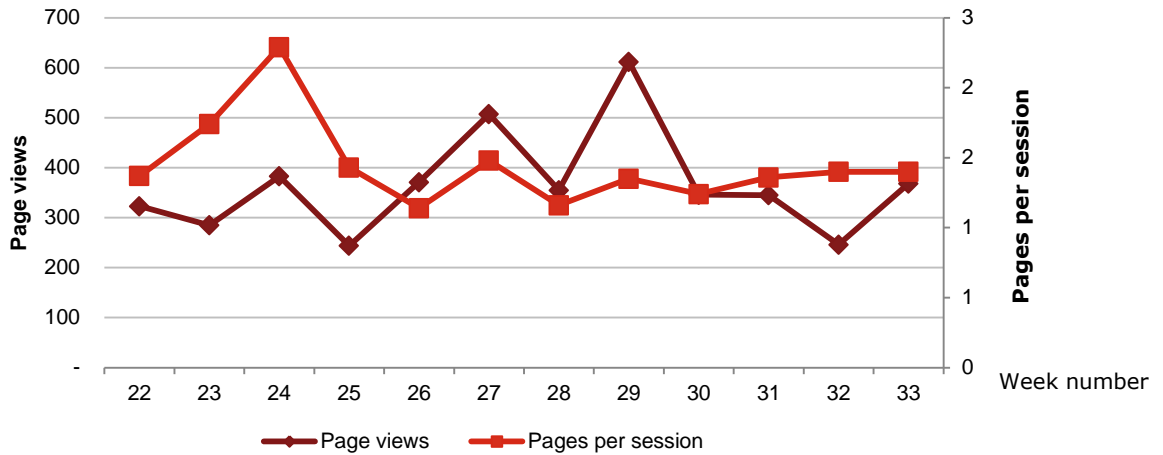


Figure 47 – LNGforShipping.eu: page views and pages per session per week

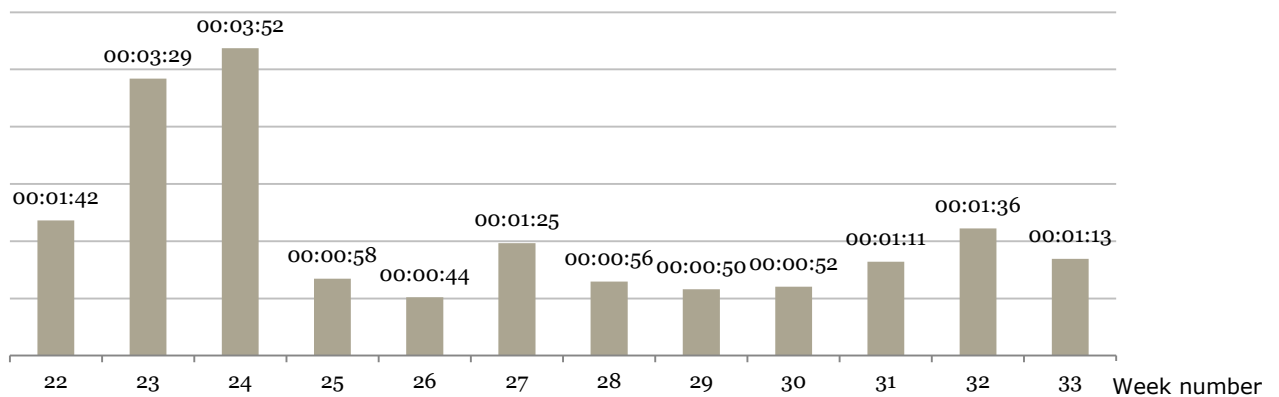


Figure 48 – LNGforShipping.eu: average session time per week (minutes)

The average time spent on the website increased in the first three weeks (during the launch of the campaign); from 1 minute 42 seconds to 4 minutes 30 seconds. As fewer changes were made on the website in weeks 25 and 26, the time spent decreased to less than 1 minute. This may look like a huge decrease, but it should be noted that there are still recurring visits as well as some new visitors. If we look at these metrics, it is safe to say that traffic (volume) is increasing and the website is becoming more user-friendly and the completeness of the information provides visitors to the website with a better understanding of the campaign and the objective.

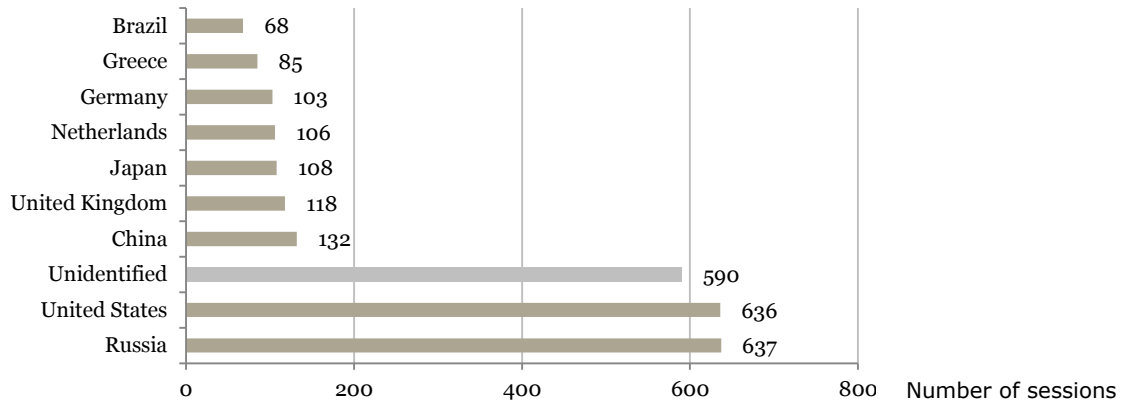


Figure 49 – LNGforShipping.eu: Top 10 countries, sessions per country (May 25–August 24, 2015)

The majority of the sessions are generated by visitors located in the United States or Russia (more than 50%), followed by China and the United Kingdom. Based on our PR activities, other articles and blog posts were written for the American and Russian audience. We expect that this has been generating leads for the website apart from the influence of American and Russian attendees at our stakeholder events or other online channels like social media. There was a large group of visitors in the period between May 25 and August 24 whose location was not identifiable.

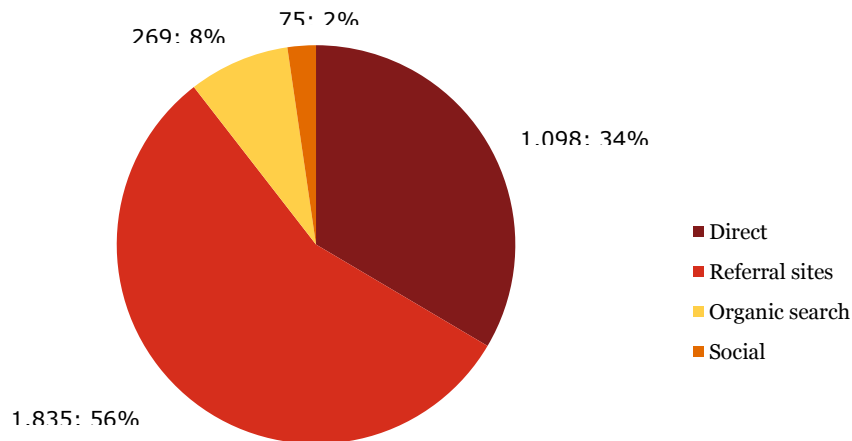
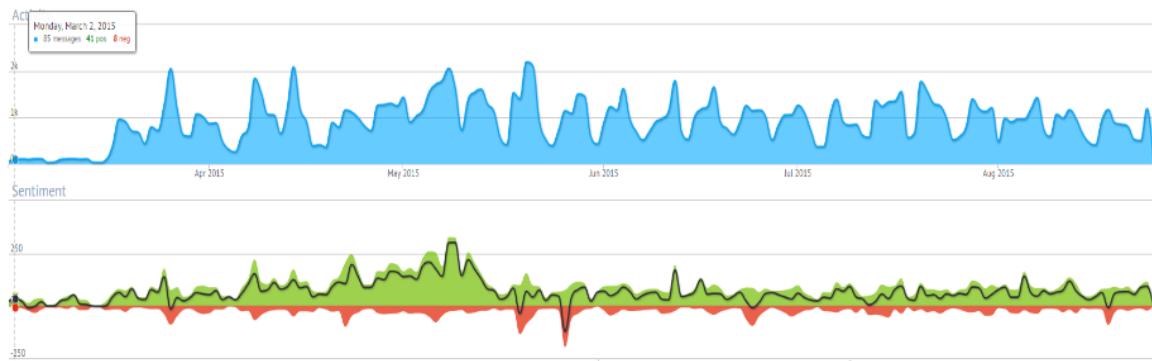


Figure 50 – Sources of incoming traffic – total of 3.277 sessions (May 25–August 24, 2015)

From our analytics, it can be concluded that two-thirds of the traffic is direct (visitors typing the LNGforShipping.com URL directly in their browser), 56% of the visitors come from referral sites (e.g. press releases, blog posts, social media), 8% of the visitors are coming from organic search (e.g. Google, Bing) and 2% of the visitors are coming from social media (e.g. Twitter).

7.2.2. Social Media/Twitter

When looking closer at the social posts (posts published across social media, e.g. social networks, blogs, forums etc.) during the campaign, we saw peaks in the number of posts related to the topics LNG in shipping (blue area in graph below). Various individuals or companies shared information or had a dialogue about LNG. From those messages, the sentiment of the messages could be categorized as positive, negative or neutral. There was a higher number of positive posts versus negative ones around the topic LNG. From March up until mid-August 2015, there were approximately 10% positive-rated messages versus 3% negative-rated ones. Some articles cover recent events around Shell and more specific events like Japan's spot price developments due to a lack of trades. In total, there were more than 150.000 posts related to LNG on social media (European Scope, March 1 until August 17).



Legend: # posts about LNG volume of positive posts
volume of negative posts

**Figure 51 –Posts related to LNG across social media –
March 1 to August 24, 2015 (source: Coosto)**

On Twitter, 107 tweets could be assigned to 56 users related to the campaign LNG for Shipping, which originated from the following countries: Belgium, UK, Sweden, Turkey, Italy, Greece, Switzerland, USA, and Spain. The results were measured from February 1 until June 30. The tweets had an estimated reach of 461,000 impressions. Most tweets came from Belgium (46.5%) followed by the UK (21.9%), Italy (8.2%), Spain (5.4%), Sweden, Greece and the final three combined (2.7%). The last 9.9% were from other countries.

A few of the most active and relevant authors were:

1. Transport_EU: official Twitter account of the European Union on Transport
2. EU_Mare: account for maritime affairs and fisheries
3. ShowMeTransport: portal for transport-related conferences, exhibitions, seminars and courses
4. InterregTweets: platform which organizes supported actions by European regions and cities to tackle common challenges

5. Transportforum: platform for debate on the future of European Transport
6. Violeta Bulc: European Commissioner for Transport

Popular hashtags included #LNGforshipping, #europeanmaritimeday, and #eutransport.

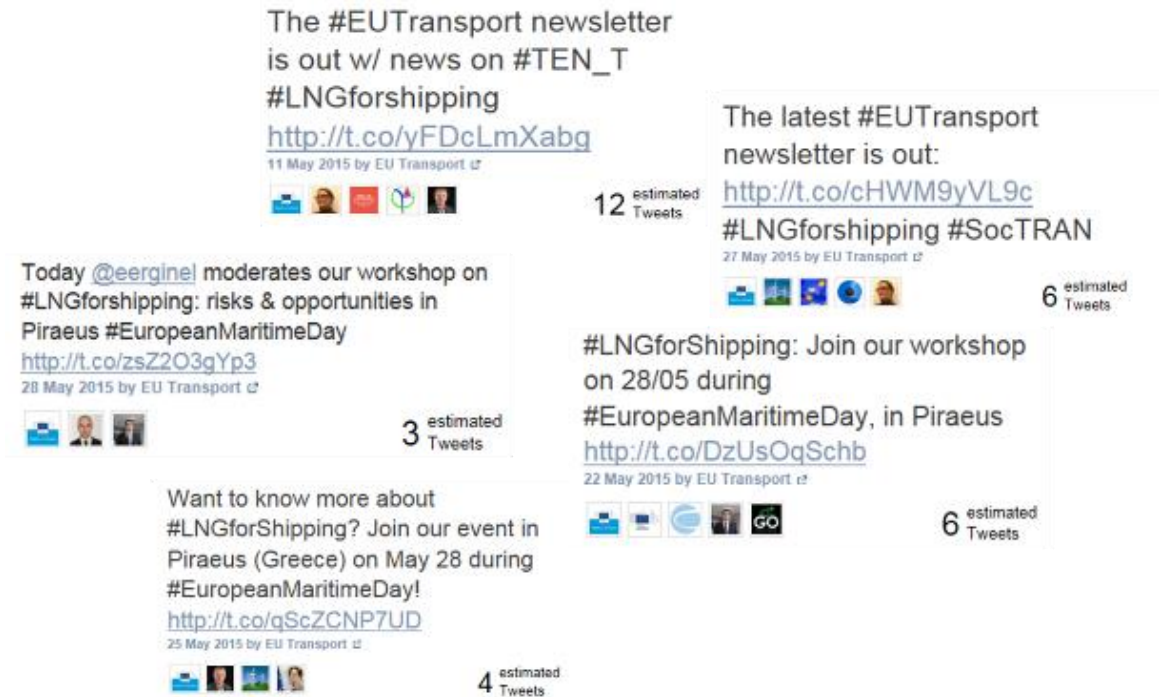


Figure 52 – Selected posts related to the campaign on Twitter (source: Sysomos)

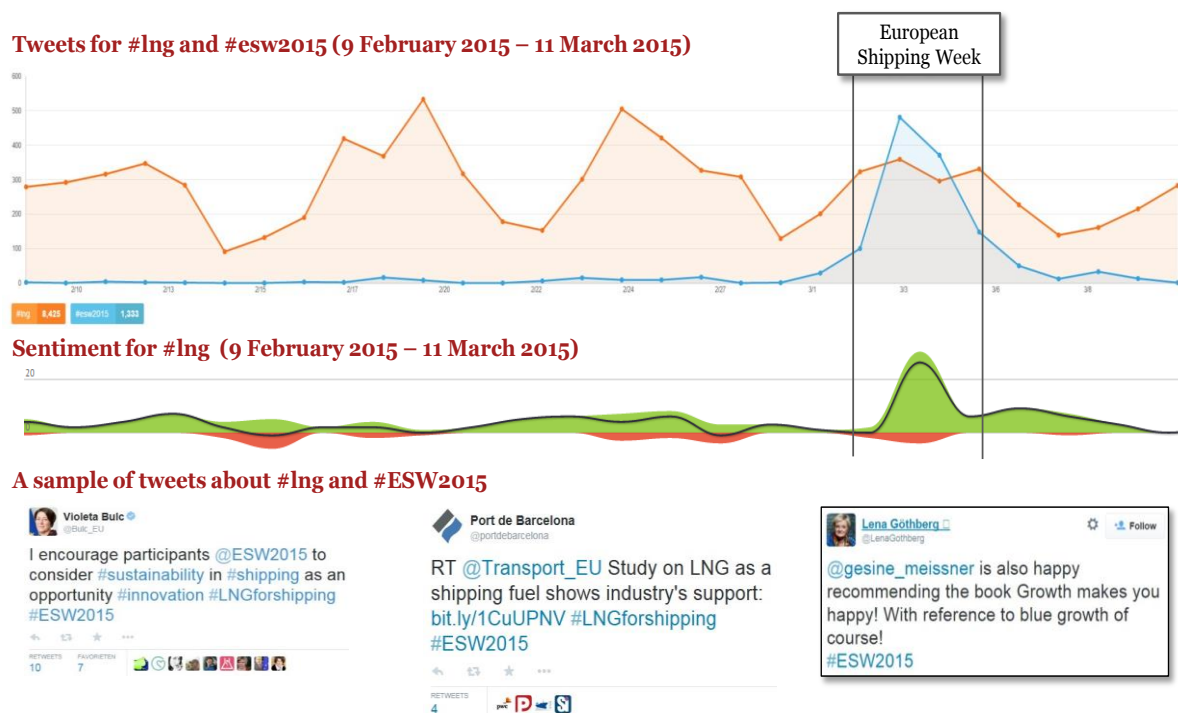


Figure 53 – Illustrative: social listening around the kick-off event (source: Coosto)

The kick-off event in Brussels had some interesting insights: as can be seen in the graph above, the number of tweets with the hashtag #lng has showed a consistent trend (orange line), while the positive sentiment showed an enormous peak during the European Shipping Week (green peak indicated positive sentiment; minor red activity indicated negative sentiment). This data tells us that due to the conference (and mainly due to the presentation of the LNG for Shipping campaign) the sentiment around LNG experienced a boost.

It can be concluded that adding social media provided value to the campaign in at least two ways:

- By means of scheduled posts via @Transport_EC, we were able to initiate or continue dialogue among stakeholders. The effects were seen during the stakeholder events, where there were positive posts around LNG and the campaign.
- We used social tools like Coosto to listen and analyse the feedback on the campaign, general LNG topics and other relevant matters around LNG. It assisted in providing more insights about our audiences.

7.2.3. Public relations

Using MSLGROUP’s professional network, two press releases were sent to inform selected, relevant media about the 'LNGforShipping' campaign. The press releases were sent on March 3 and May 28 to various agencies, journalists and (other) platforms.

The release (March 3) was sent out by the PR agency Elaborate Communications in London who was organizing all PR around the European Shipping Week. They sent out

the release to a solid database of more than 800 trade press media, particularly in the maritime sector. After sending out the release we were in personal contact with different journalists, e.g. Paul Gunton (Marine Propulsion Magazine) and Karen Thomas (LNG World Shipping), supplying them with more detailed information on the campaign and LNG for shipping.

The press releases were taken up on traditional and new media platforms, e.g. WorldMaritimeNews.com, Guardian.com, EuropeanEnergyInnovation.eu, ShipandBunker.com, LNGindustry.com, and AllAboutShipping.co.uk. Thereby, especially local trade media focused on transport (including maritime), logistics, EU politics and energy represented an important communication channel. The press release was shared via more than 35 platforms among 5 local markets.

Overall, the press release was taken up very broadly by the media: for example, in the month of June, we found various articles in the following countries: the UK, Canada, the Netherlands, Finland, Trinidad, the United States, Belgium, Norway and Greece.

The appendix features the press releases (Appendix 8.3) and reactions to the press releases (Appendix 8.6).

7.2.4. Stakeholder events

The stakeholder events were an important element of the campaign. We organized six events at locations spread across Europe: Brussels (kick-off and closing event), London, Piraeus, Hamburg and Amsterdam. In total we reached approximately 340 people with our events. As our invitations to the events were sent to a multiple of the number of actual participants, the communication effect of the events was even higher.

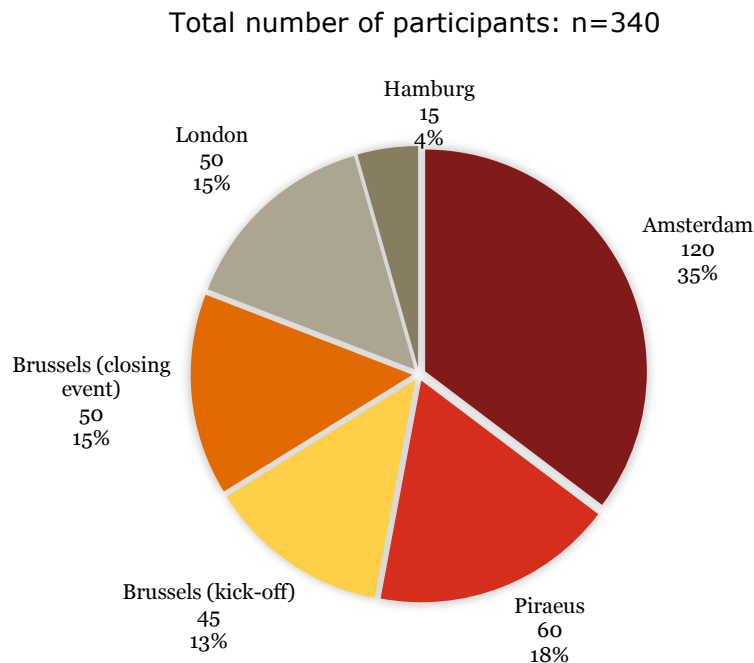


Figure 54 – Number of participants in respective events

As the objective and setting of each event differed, the attendee rates differed as well; the event in Amsterdam was attended by the most visitors (120 participants, a commercial conference). In short, the percentage of attendees per hosted event: Amsterdam (35%), Piraeus (18%), Brussels (28%, combined kick-off and closing event), London (15%), and Hamburg (4%).

Total number of participants: n=340

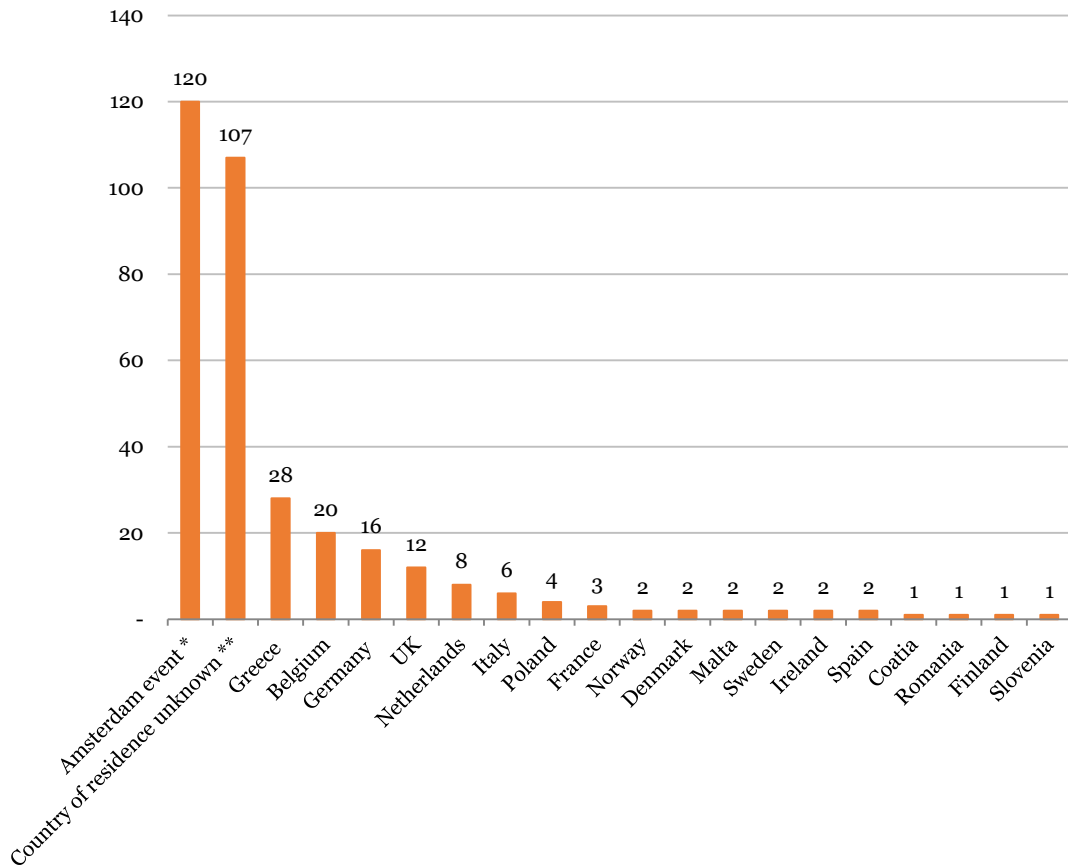


Figure 55 – Countries of residence of event participants

It was our target to reach a relatively broad mix of participants across Europe. For one of the events (* – Amsterdam, a commercial conference) we did not obtain participant information. At our own events, not all participants registered with their complete contact details (** – country of residence unknown). Those participants who registered for the event came from several different European countries: there is a good spread of attendees over at least 16 countries.

In general, the events were received well among the invited attendees. The attendees of the first event were mainly invited via personal network, whereas the invitees of the following events were invited via the European Commission and networks like ESSF, SGMF and IAPH.

Apart from receiving feedback during the event from attendees, we asked them to fill out a short questionnaire (see questionnaire in Appendix 8.5) to provide feedback about the event. The feedback was collected and analysed each time, which provided

input for the next event. The majority of the completed questionnaires were collected from the "Financing LNG" event in London, followed by the event in Piraeus. The event in Hamburg did not count a lot of visitors, therefore only two questionnaires were collected. In Brussels (kick-off), no attendee completed the questionnaire (the feedback forms were not publicly announced). At the conference in Amsterdam, no feedback forms were distributed (because it would have been inappropriate in the context of this commercial conference).

Total number of surveys collected: n=79
(Amsterdam: no questionnaires distributed)

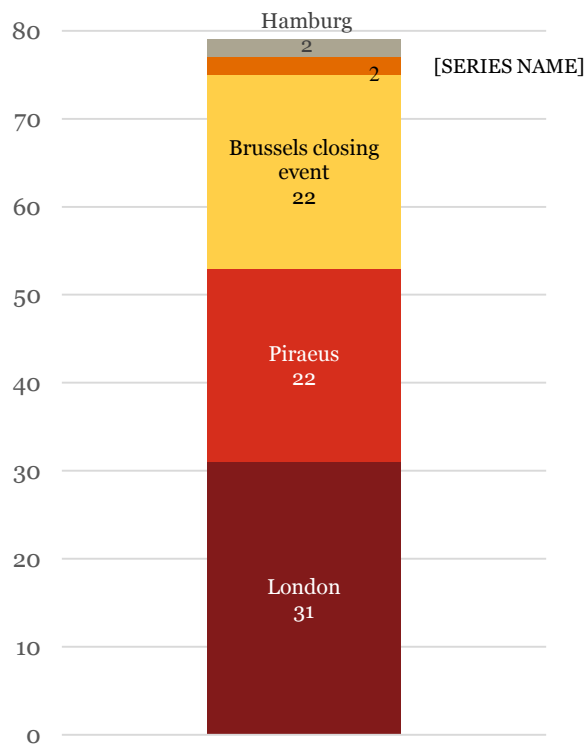


Figure 56 – Number of surveys collected per event

As mentioned above, the invitations to the first event were sent out via PwC's, DNV-GL's and MSLGROUP's professional network. However, the first contact with some of the attendees was established during the research study phase, where we approached experts around the topics shipping, energy and LNG. During the focus interviews, we asked participants whether we could approach them after the research study for updates on the campaign, events and other relevant information. The majority of the study participants opted in for further information. The result can also be seen in figure 57, where approximately 26% of the respondents received a direct invite from DG MOVE, PwC, DNV-GL or MSLGROUP. The majority of the respondents received recommendations from colleagues, which is partially the result of our campaign where we asked our target audience to share our platform with their professional network.

Total number of responses: n=70

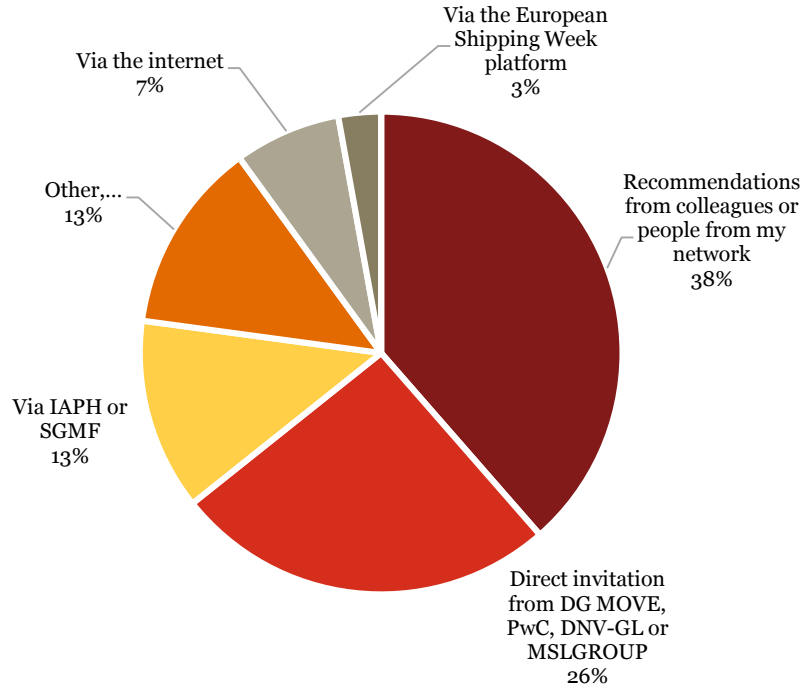


Figure 57 – Knowledge about the event, source of invitation

The majority of the respondents rate the content and discussions of the event highly; approximately 35% of the respondents rated it as excellent whereas approximately 55% rated it as good.

Total number of responses: n=77

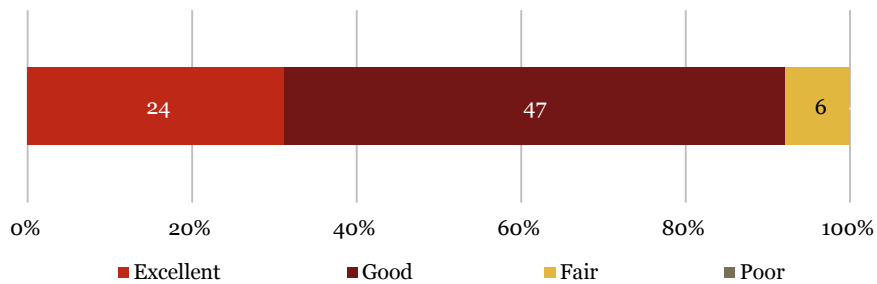


Figure 58 – Rating of the content of the event

The attendees rated the speakers as highly as the content and discussions of the event. More than 90% of the attendees rated the speakers as excellent or good. Less than 10% of the respondents rated the speakers as fair. The positive comments included that the event was very helpful and interesting. Some respondents suggested to publish more about economic issues, include results of other reports and provide more quantitative data.

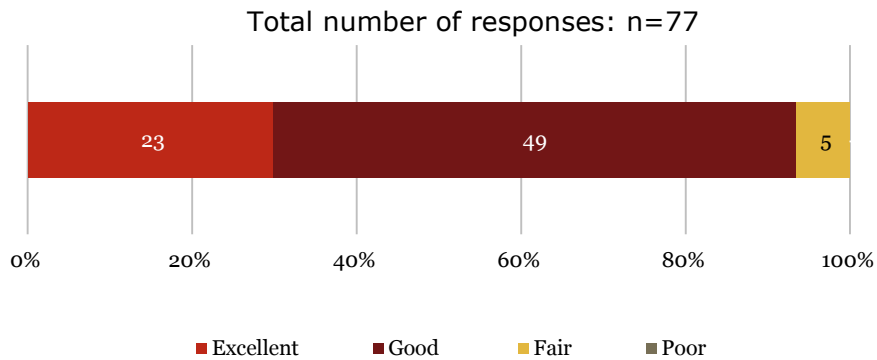


Figure 59 – Rating of the speakers of the event

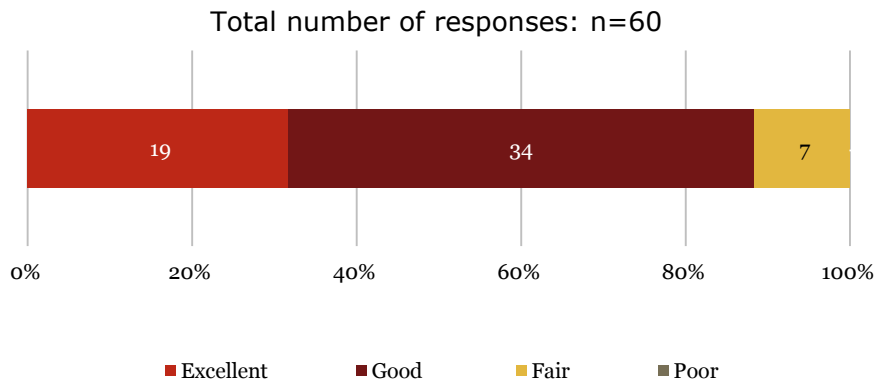


Figure 60 – Rating of the event overall

The feedback provided by the attendees revolved around two subjects: facilities of the event and the content discussed. During each stakeholder event, we were very careful in organizing the right facilities for the event. The number of attendees at the London event was higher than expected, which resulted in a very crowded room and less space for the attendees. As can be seen above, this is one of the main improvement points mentioned by the respondents. Nearly 90% of the respondents would recommend the event to others.

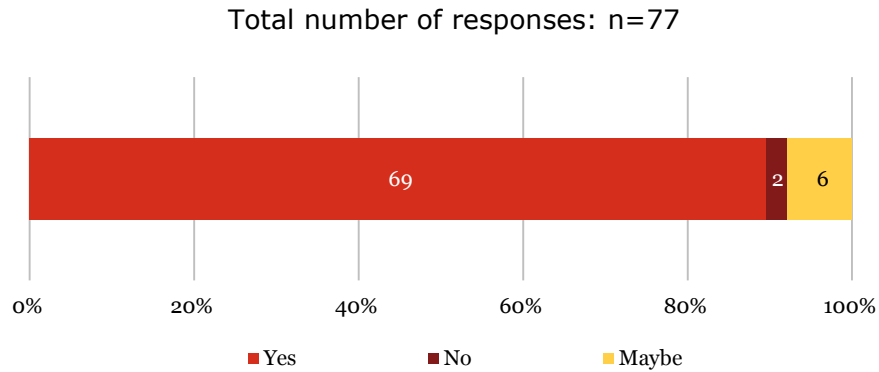


Figure 61 – Question: would you recommend this event to others?



Figure 62 – Examples of comments about facilities and content of the events

Overall, the attendees were positive to very positive towards the hosted events.

7.2.5. Flyer

The flyer was shared via the website and during the events. At least 400 people have seen the flyer.

7.2.6. Brochure and video

The brochure and videos were completed at the end of the project duration. Therefore no performance metrics are available for these parts of the campaign.

8. Appendix

8.1. Questionnaire for stakeholder analysis



Welcome to the online survey LNG-fuelled ships and provision of LNG fuel!

Background of this survey

The European Commission's Directorate-General for Mobility and Transport (DG MOVE) has mandated PwC and DNV-GL to analyse and evaluate gaps on the way to completion of an EU framework on LNG-fuelled ships and provision of LNG fuel. The findings of this survey will support the development of a policy framework and will thus help to support the further diffusion of LNG as a shipping fuel. Therefore, it is essential to develop a clear understanding of the opinions of various stakeholder groups towards opportunities and barriers with regards to LNG as a shipping fuel. In the first quarter of 2015, an online information portal will be launched and local events will be organized by MSLGROUP to provide the results of the survey and to facilitate further discussions on this topic.

Privacy and survey findings

We respect your privacy and will treat your response anonymously. No private information of respondents, such as names and contact details, will be published. Upon request, we will share the survey findings with you in the first quarter of 2015.

Online survey

The survey you are about to participate in will take approximately 20 minutes to complete. It is possible to save your answers and continue the survey at a later moment. If you have any questions during the survey you can direct your questions to Axel von Perfall (PwC) or Eelco Kruizinga (DNV-GL).

Thank you for your participation.

Kind regards,

Axel von Perfall axel.von.perfall@de.pwc.com

Eelco Kruizinga eelco.kruizinga@dnvgl.com

PwC, DNV-GL and MSLGROUP on behalf of the European Commission



Q1 LNG as shipping fuel (Question 1 - 3) Please select the option(s) that best reflects your knowledge about LNG as shipping fuel.

	Aware of the topic (1)	Understand the topic (2)	Use existing knowledge in my work (3)	Actively contribute new knowledge (4)
In general, LNG as shipping fuel (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Technology and infrastructure (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Economic aspects (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Regulatory aspects (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please specify) (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q2 What percentage of your working time are you active in the area of LNG as a shipping fuel?

_____ Please drag the slider to the percentage of your choice. (6)

Q3 To what degree does your organization support LNG as shipping fuel?

- Very supportive (1)
- Supportive (2)
- Not so supportive (3)
- Not supportive (4)

Q4 Opportunities for LNG as shipping fuel (Question 4 - 12) Please rate and comment on the opportunities and benefits related to LNG as shipping fuel.

	Very unlikely (1)	Unlikely (2)	Likely (3)	Very Likely (4)
a) Environmental effects / compliance with ECA zones (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b) Economic benefits (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c) Energy sourcing flexibility (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d) Other (please specify) (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q5 Please comment on your answers below.

Q6 In your opinion, how likely will the following items contribute to environmental benefits of LNG as shipping fuel?

	Very unlikely (1)	Unlikely (2)	Likely (3)	Very likely (4)
1) Environmental effects / compliance with ECA zones (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) Decreasing green house gasses (GHG) emissions (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) Decreasing particle matters (PM) emissions (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4) Reducing noise levels (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5) Other (please specify) (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q7 Please comment on your answers below.

Q8 In your opinion, how likely will the following items contribute to economic opportunities of LNG as shipping fuel?

	Very unlikely (1)	Unlikely (2)	Likely (3)	Very likely (4)
1) Competitive fuel prices (lower variable costs) (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) Lower OPEX for engines (lower costs for maintenance & service) (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) Business opportunity bunkering infrastructure (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4) Excess supply of LNG (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5) Job creation (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6) Other (please specify) (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q9 Please comment on your answers below.

Q10 In your opinion, how likely will the following items contribute to energy sourcing alternatives for LNG as shipping fuel?

	Very unlikely (1)	Unlikely (2)	Likely (3)	Very likely (4)
1) Greater variation of fuel sourcing (less dependency on oil) (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) Greater variation of fuel distribution (diversify energy mix) (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) Other (please specify) (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q11 Please comment on your answers below.

Q12 Do you have any additional comments on the opportunities that currently make the further use of LNG shipping beneficial? If so, what should be done to proceed or accelerate these opportunities?

Q13 Barriers for LNG as shipping fuel (Question 13 - 24) Please rate and comment on the barriers and difficulties related to LNG as shipping fuel.

	Very unlikely (1)	Unlikely (2)	Likely (3)	Very likely (4)
a) Negative perception (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b) Inadequate standards & regulation (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c) Insufficient safety & security (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d) Uncertain financial situation (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e) Other (please specify) (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q14 Please comment on your answers below.

Q15 In your opinion, how likely will the following groups contribute to negative perception for LNG as shipping fuel?

	Very unlikely (1)	Unlikely (2)	Likely (3)	Very likely (4)
1) The general public (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) (Local) interest groups (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) Captains and crews (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4) Other (please specify) (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q16 Please comment on your answers below.

Q17 In your view, which information is the general public expecting or missing regarding LNG as a fuel?

Q18 In your opinion, how likely will the following items contribute to inadequate standards & regulation for LNG as shipping fuel?

	Very unlikely (1)	Unlikely (2)	Likely (3)	Very likely (4)
1) Fragmented EU-wide/global regulations on LNG as shipping fuel (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) Fragmented permitting process (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) Lack of harmonized equipment standards (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4) Lack of harmonized safety and security standards (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5) Other (please specify) (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q19 Please comment on your answers below.

Q20 In your opinion, how likely will the following items contribute to insufficient safety & security for LNG as shipping fuel?

	Very unlikely (1)	Unlikely (2)	Likely (3)	Very likely (4)
1) General safety risk of handling LNG (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) Higher safety risk due to increased number of players on small-scale LNG market (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) Risk of sabotage and terrorism (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4) Other (please specify) (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q21 Please comment on your answers below.

Q22 In your opinion, how likely will the following items contribute to an uncertain financial situation for LNG as shipping fuel?

	Very unlikely (1)	Unlikely (2)	Likely (3)	Very likely (4)
1) Unclear pricing scheme for LNG as a fuel (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) Price of LNG is volatile and hardly predictable (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) Price of LNG is not competitive to alternative fuels (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4) Risk of higher-than-expected costs due to technical risk (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5) Risk of higher-than-expected costs due to commercial risks (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6) Taxation & legislation not fully defined yet (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7) Other (please specify) (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q23 Please comment on your answers below.

Q24 Do you have any additional comments on the barriers that currently make the further use of LNG as shipping fuel difficult? If so, what should be done to overcome them?

Q25 LNG uptake How confident are you about the adoption of LNG as a shipping fuel across the value chain?

- Not Confident (1)
- Somewhat Confident (2)
- Confident (3)
- Very Confident (4)

Q26 Activities regarding LNG as shipping fuel (Question 26 - 31) Has your organization been involved or will it be involved with activities regarding LNG as shipping fuel?

	Definitely yes (1)	Probably yes (2)	Probably not (3)	Definitely not (4)
In the past 12 months (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
in the coming 12 months (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q27 In which LNG activities has your organization been involved in the past 12 months?

- full scale: subsea, production, liquefaction and/ or large scale storage and distribution (1)
- small scale: intermediate distribution; intermediate storage, bunker/ break bulk (2)
- ships: marine fuel/ other markets (3)
- None of the above (4)

Q28 In which LNG activities will your organization be involved in the coming 12 months?

- full scale: subsea, production, liquefaction and/ or large scale storage and distribution (1)
- small scale: intermediate distribution; intermediate storage, bunker/ break bulk (2)
- ships: marine fuel/ other markets (3)
- None of the above (4)

Q29 Have you partnered or have the intent to partner with other organizations to enable or accelerate your activities regarding LNG as shipping fuel?

	Definitely yes (1)	Probably yes (2)	Probably no (3)	Definitely no (4)
In the past 12 months (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the coming 12 months (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q30 If so, what type of organizations have you partnered with or will you be partnering with?

Q31 Also, please specify the type of partnering activities you maintain or are planning to engage in.

Q32 Your media preferences (Q32 - Q37) How often do you use the following media channels for business purposes, i.e. reading news, sharing information, etc.?

	Never (1)	Rarely (2)	Sometimes (3)	Quite Often (4)
E-mail (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Newsletters (print and digital) (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Internet websites (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Academic papers (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Events, conferences and seminars (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social Media (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Magazines and brochures (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q33 What are your preferred channels/ ways to stay up-to-date on LNG developments? Please rank the items below from 1 (most preferred) to 7 (least preferred) by dragging and dropping them in your preferred order.

- _____ Newsletter (print and digital) (1)
- _____ Magazines and brochures (2)
- _____ Internet websites (3)
- _____ Academic papers (4)
- _____ Events, conferences and seminars (5)
- _____ Social Media (6)
- _____ E-mail (7)

Q34 If you have participated in industry events, could you specify your preferred events regarding the topics LNG, energy or shipping? Please provide the names and location of these events.

- Event 1 (1)
- Event 2 (2)
- Event 3 (3)
- Event 4 (4)
- Event 5 (5)

Q35 Which key organizations or websites do you follow/ use to stay up-to-date on the topics: LNG, energy or shipping?

- Company or website 1 (1)
- Company or website 2 (2)
- Company or website 3 (3)
- Company or website 4 (4)
- Company or website 5 (5)

Q36 Do you miss any information regarding LNG among the media channels you use? i.e. are there any LNG topics that you are particularly interested in?

Q37 Next year, we will organize network events across Europe to discuss LNG related topics and developments. The events will focus on topics such as LNG policy measures, opportunities and barriers for public and private organizations and innovations. Would you like to receive an invitation to these events?

- Yes (1)
- No (2)

Q38 In your opinion, are there any topics that were not covered in this survey? If so, what would they be?

Q39 How would you classify your organization?

- Public // Local authorities (1)
- NGO's // Environmental organizations and other NGO's (2)
- Authorities // Government and policy makers (3)
- Authorities // Maritime transport authorities of the EU Member States (4)
- Authorities // Industry associations (5)
- Industry // Shipowners and managers (6)
- Industry // Service suppliers, including bunkering services provision (7)
- Industry // Gas suppliers (8)
- Industry // Port authorities (9)
- Industry // Terminal operators (10)
- Industry // Shipbuilders and maritime equipment (11)
- Industry // Investors and financial institutions (12)
- Industry // Classification societies (13)
- Research and education // Universities / technical educators and research institutions (14)
- Consulting firms (15)
- Other (please specify) (16) _____

Q40 How many people are employed by your organization?

- < 10 (1)
- 10 - 99 (2)
- 100 - 499 (3)
- 500 - 4,999 (4)
- 5,000 - 9,999 (5)
- 10,000+ (6)

Q41 We respect your privacy and will anonymize the survey results. Would you like to be updated on the result of the study?

- Yes (1)
- No (2)

Q42 If you would like us to send you the survey results, please provide your name, organization and e-mail address.

- First name (1)
- Last name (2)
- Job title (3)
- Organization (4)
- E-mail address (5)
- Address (6)
- Address 2 (7)
- City (8)
- State (9)
- Postal Code (10)
- Country (11)

To increase the number of respondents, we would appreciate if you share this survey with other industry professionals. You can do this by sharing the link of this online survey. Thank you!

Figure 63 – Survey questionnaire

Question response rates

No.	Question response rate	N	%
1	LNG as shipping fuel (Question 1 - 3) Please select the option(s) that best reflects your kn...	74	96%
2	What percentage of your working time are you active in the area of LNG as a shipping fuel?	71	92%
3	To what degree does your organization support LNG as shipping fuel?	74	96%
4	Opportunities for LNG as shipping fuel (Question 4 - 12) Please rate and comment on the op...	65	84%
5	Please comment on your answers below.	29	38%
6	In your opinion, how likely will the following items contribute to environmental benefits of LNG...	62	81%
7	Please comment on your answers below.	21	27%
8	In your opinion, how likely will the following items contribute to economic opportunities of LNG...	62	81%
9	Please comment on your answers below.	20	26%
10	In your opinion, how likely will the following items contribute to energy sourcing alternatives f...	58	75%

11	Please comment on your answers below.	14	18%
12	Do you have any additional comments on the opportunities that currently make the further use of L...	17	22%
13	Barriers for LNG as shipping fuel (Question 13 - 24) Please rate and comment on the barrie...	61	79%
14	Please comment on your answers below.	19	25%
15	In your opinion, how likely will the following groups contribute to negative perception for LN...	55	71%
16	Please comment on your answers below.	19	25%
17	In your view, which information is the general public expecting or missing regarding LNG as a fuel?	31	40%
18	In your opinion, how likely will the following items contribute to inadequate standards & regu...	57	74%
19	Please comment on your answers below.	18	23%
20	In your opinion, how likely will the following items contribute to insufficient safety & security...	58	75%
21	Please comment on your answers below.	12	16%
22	In your opinion, how likely will the following items contribute to an uncertain financial situ...	58	75%
23	Please comment on your answers below.	16	21%
24	Do you have any additional comments on the barriers that currently make the further use of LNG as...	13	17%
25	LNG uptake How confident are you about the adoption of LNG as a shipping fuel across the valu...	57	74%
26	Activities regarding LNG as shipping fuel (Question 26 - 31)Has your organization been involved...	55	71%
27	In which LNG activities has your organization been involved in the past 12 months?	56	73%
28	In which LNG activities will your organization be involved in the coming 12 months?	55	71%
29	Have you partnered or have the intent to partner with other organizations to enable or accelerate...	54	70%
30	If so, what type of organizations have you partnered with or will you be partnering with?	31	40%

31	Also, please specify the type of partnering activities you maintain or are planning to engage in.	20	26%
32	How often do you use the following media channels for business purposes?	53	69%
33	What are your preferred channels/ ways to stay up-to-date on LNG developments? Please rank t...	46	60%
34	If you have participated in industry events, could you specify your preferred events regarding th...	26	34%
35	Which key organizations or websites do you follow/ use to stay up-to-date on the topics: LNG, ene...	30	39%
36	Do you miss any information regarding LNG among the media channels you use? i.e. are there any LN...	10	13%
37	Next year, we will organize network events across Europe to discuss LNG related topics and devel...	51	66%
38	In your opinion, are there any topics that were not covered in this survey? If so, what would the...	11	14%
39	How would you classify your organization?	57	74%
40	How many people are employed by your organization?	51	66%
41	We respect your privacy and will anonymize the survey results. Would you like to be updated on...	51	66%
42	If you would like us to send you the survey results, please provide your name, organization and...	54	70%
43	To increase the number of respondents, we would appreciate if you share this survey with other in...	0	0%

Figure 64 – Question response rates

8.2. List of participating organizations (stakeholder research)

Contact	Stakeholder Type	Questionnaire filled	Interview conducted
A.M. Nomikos Transworld	Shipowners and managers	yes	yes
Aegean Bunkering Services Inc.	Service suppliers, including bunkering services provision	yes	yes
Agelicooussis Group	Shipowners and managers	yes	yes
AirClim	NGO's // Environmental organizations and other NGOs	yes	yes
APL, S.A.	Port authorities	yes	no
APRAM	Port authorities	yes	yes
Authority for Transport Malta	Port authorities	yes	yes
BLN	Industry associations and expert network	no	yes
Bomin Linde	Service suppliers, including bunkering services provision	yes	yes
BP	Gas suppliers	no	yes
Contenaval	Consulting Firms	yes	no
Damen Shipyards	Shipbuilders and maritime equipment	yes	yes
DEPA	Gas suppliers	yes	yes
DFDS	Shipowners and managers	yes	yes
DMA	Government and policy makers	yes	no
DNV-GL	Consulting Firms	yes	no
EON Ruhrgas	Gas suppliers	yes	yes
Exmar	Shipowners and managers	no	yes
Federal Public Service Mobility and Transport	Government and policy makers	yes	yes
Finnish Association for Nature Conservation	NGOs // Environmental organizations and other NGOs	yes	yes

European Commission
 Study on the completion of an EU framework on LNG-fuelled ships and its relevant fuel provision
 infrastructure - LOT 2 "Creating Awareness on LNG Risks and Opportunities"

Finnish Transport Safety Agency	Government and policy makers	yes	no
Fjord Lines A/S	Shipowners and managers	yes	yes
Flinter Management	Shipowners and managers	yes	yes
Freeport of Riga Authority	Port authorities	yes	no
GasLog	Shipowners and managers	yes	yes
Gasnor	Gas suppliers	yes	yes
Gasprom	Gas suppliers	yes	no
Glencore	Gas suppliers	no	yes
HVB	Investors and financial institutions	no	yes
ILT Scheepvaart	Shipowners and managers	yes	no
K&L Gates	Consulting Firms	no	yes
Linde AG	Consulting Firms	yes	no
MAN Turbo & Diesel	Shipbuilders and maritime equipment	yes	yes
NABU	NGOs // Environmental organizations and other NGOs	yes	yes
Navitos	Shipowners and managers	yes	yes
Niedersachsen Ports	Port authorities	yes	no
Port of Bremen	Port authorities	no	yes
Port of Hamburg	Port authorities	no	yes
Port of Stockholm	Port authorities	yes	no
Port of Venice	Port authorities	yes	yes
Prime Maritime	Shipowners and managers	yes	yes
Reganosa	Gas suppliers	yes	yes
REPSOL	Gas suppliers	yes	yes
Royal Belgian Shipowners	Industry associations and expert network	yes	yes

European Commission
 Study on the completion of an EU framework on LNG-fuelled ships and its relevant fuel provision
 infrastructure - LOT 2 "Creating Awareness on LNG Risks and Opportunities"

Association			
Seago	Shipowners and managers	yes	yes
SEWCU	Government and policy makers	yes	yes
SGMF	Shipowners and managers	yes	yes
Shell	Gas suppliers	yes	no
Skangass	Gas suppliers	no	yes
TernTank	Shipowners and managers	yes	yes
Thenamaris Group	Shipowners and managers	yes	yes
TNO (Research Institute)	Technical educators and research institutions	yes	yes
Tsakos Energy Navigation	Shipowners and managers	yes	yes
Unicredit	Investors and financial institutions	no	yes
Viking Line	Shipowners and managers	yes	no
WWF European Policy Office	NGOs // Environmental organizations and other NGOs	yes	yes

8.3. Public Relations

Various press releases were prepared to provide more visibility for the campaign.



European Commissions' study on LNG as a shipping fuel shows industry's support

Brussels, 3 March 2015 – The European Commission today presented the preliminary results of a study on the perception of the risks and opportunities of LNG as a shipping fuel. The results show that stakeholders recognise the environmental advantages of LNG as a shipping fuel, but are still uncertain whether they offer a clear business case. At the meeting, held during the European Shipping Week, the European Commission discussed with LNG industry stakeholders the outcomes of the study.

"This study gives us a solid overview of the opportunities and remaining challenges for the use of LNG for shipping. More importantly: the outcome helps us to feed a public debate on LNG for shipping and provides arguments for a stakeholder debate at local level." said Sandro Santamato, Head of Unit Maritime transport & Logistics, European Commission.

The study takes into account the overall EU policy aiming at reductions of emissions from shipping and looking for alternative energy sources, in view of growing constraints on the use of heavy fuels. It also summarises recent legislation: Firstly, the Directive on sulphur content in marine fuels (2012/33/EU) which allows the use of LNG as an alternative fuel to comply with more stringent emission standards. Secondly, the Directive on deployment of alternative fuels infrastructure (2014/94/EU) which aims at ensuring minimum coverage of LNG refuelling points in main maritime and inland ports across Europe by 2025 and 2030 respectively, with common standards for their design and use.

Environmental advantages remain undisputed, despite a lack of profitability

From the study it becomes clear that on the one hand, the major motivation for stakeholders to engage in LNG as a shipping fuel is to be compliant with Emission Controlled Area (ECA) zone requirements and the related positive environmental effects. On the other hand, the most critical issues for further deployment are the financing of LNG as a fuel and the pricing of LNG itself. For many companies, and especially shipping companies, LNG does not offer a profitable business model yet: the higher equipment costs for engines and tanks are not offset by savings in fuel or operating expenses. Also, the lack of existing bunkering infrastructure for LNG is another quite important barrier.

More about the study

The European Commission's Directorate-General for Mobility and Transport (DG MOVE), PwC and DNV-GL are conducting the analysis and evaluation of the gaps that exist in the regulatory framework for LNG-fuelled ships and the provision of LNG fuel. The research is focusing on risks and opportunities of using LNG as a shipping fuel.

Final results of the study will become available in June/July 2015.

Figure 65 – Press release kick-off campaign



The screenshot shows the European Commission website with the following content:

- MOBILITY AND TRANSPORT** header
- Navigation menu: Home, Transport modes, Transport themes, Media corner, Facts & fundings, About us
- Search and Share buttons
- LNG for shipping meeting: A profitable business case** (Section Header)
- LNG for shipping meeting: A profitable business case** (Sub-Header)
- 13 May 2015 (Date)
- IMO Marine Environment Protection Committee, London (Location)
- ***** (Separator)
- In March, the European Commission presented preliminary results of a study on the perception of the risks and opportunities of LNG as a shipping fuel. These results and the financial aspects of the LNG business case is the topic of the event "LNG for shipping: A profitable business case held on 13 May 2015, during the IMO Marine Environment Protection Committee.**
- The European Commission's Directorate- General for Mobility and Transport (DG MOVE), supported by PriceWaterhouseCoopers and DNV-GL, is conducting an analysis and evaluation of the gaps that exist in the regulatory framework for LNG-fuelled ships and the provision of LNG fuel. During the event in London the partners will present insights of their stakeholder research. The results of the study on LNG for shipping show that stakeholders recognize the environmental advantages of LNG as a shipping fuel, but are still uncertain whether they offer a clear business case.**
- Richard Mason, the European Commission's representative at the IMO, will open the event, followed by key note speaker Erik Skramstad, Vice President at DNV GL. Mr Skramstad is responsible for DNV GL's global LNG activities and he is mainly working on safety-related issues associated with the handling of liquefied gases, offshore oil and gas production, and research and development.**
- More about the study**
- The European Commission's Directorate-General for Mobility and Transport (DG MOVE), PwC and DNV-GL are conducting the analysis and evaluation of the gaps that exist in the regulatory framework for LNG-fuelled ships and the provision of LNG fuel. The research is focusing on risks and opportunities of using LNG as a shipping fuel.**
- Final results of the study will become available in July 2015.**
- [Invitation](#) [3 MB]

Figure 66 – Press release London event (European Commission website)

LNG for Shipping: Risks and opportunities

Piraeus, 28 May 2015 – Today, during the European Maritime Day 2015, the European Commission’s Directorate-General for Mobility and Transport (DG MOVE) organizes a workshop in Piraeus, Athens. During this workshop the preliminary results of the study on the perception of the risks and opportunities of LNG as a shipping fuel are discussed.

Current legislation puts tighter limits on emissions of seagoing vessels in European waters. Emission Control Areas (ECAs) force the operators of vessels to use propulsion systems that result in lower emissions. One of the possible solutions is the use of LNG as a shipping fuel.

The European Commission’s Directorate-General for Mobility and Transport (DG MOVE), supported by PricewaterhouseCoopers (PwC) and DNV-GL, has launched a study on the perception of the risks and opportunities of LNG as a shipping fuel and on the gaps that exist in the regulatory framework for LNG-fuelled ships and the provision of LNG fuel.

Mr. Erdem Erginel, representative to the European Commission and DG MOVE moderates the workshop. The first keynote speaker is Mr. Stavros Hatzigrigoris Managing Director of Maran Gas Maritime Inc./Angelicooussis Group. He will speak about LNG as the shipping fuel of the future. Followed up by Mr. Mario Dogliani of Rina Services S.p.A., he gives a status report on the TEN-T Project COSTA and its follow-ups.

More about the study DG MOVE, PwC and DNV-GL are conducting the analysis and evaluation of the gaps that exist in the regulatory framework for LNG-fuelled ships and the provision of LNG fuel. The research is focusing on risks and opportunities of using LNG as a shipping fuel.

Final results of the study will become available in June/July 2015.

Contact for enquiries Axel von Perfall T: +49 151 26817261

axel.von.perfall@de.pwc.com

Figure 67 – Press release Piraeus event

LNG for Shipping: The risks and opportunities

Brussels, 15 June 2015 – Today the European Commission presents and discusses the analysis and evaluation of the study on LNG for shipping. This event will be the last one in a series of several events on LNG for shipping in Amsterdam, London, Piraeus and Hamburg.

During the event in Brussels, Mr. Kommorowski of Becker Marine Systems presents their case of the LNG Power Barge and the clean power provision to ships in harbors by using LNG. The LNG Power Barge is a vessel providing clean and efficient power to cruise ships. Furthermore, Shell's Downstream LNG Business Development Manager Europe, Arjan Stavast, will present Shell's activities in LNG for shipping.

The European Commission's Directorate- General for Mobility and Transport (DG MOVE), supported by PriceWaterhouseCoopers and DNV-GL, conducted an analysis and evaluation of the gaps that exist in the regulatory framework for LNG-fuelled ships and the provision of LNG fuel.

DG MOVE will present the analysis and evaluation of identified gaps and of the remaining aspects for completing an EU-wide framework for marine LNG distribution, bunkering and use. This will be followed up by an analysis of the LNG market developments in the EU, presented by Jasper Faber of CE Delft, an independent research and consultancy organization.

The interim results of this will be presented by the contractors DNV-GL, PricewaterhouseCoopers and CE Delft.

Find more information in our flyer on www.lngforshipping.eu
Final results of the study will become available in June/July 2015.

Figure 68 – Press release closing event in Brussels

8.4. Reactions on press releases and further references to the campaign

EC: industry shows support for use of LNG as shipping fuel

The European Commission unveiled the preliminary results of a study on the perception of the risks and opportunities of LNG as a shipping fuel.

According to the study, the results show that stakeholders recognise the environmental advantages of LNG as a shipping fuel, but are still uncertain whether they offer a clear business case. The European Commission and LNG industry stakeholders discussed the outcomes of the study.

"This study gives us a solid overview of the opportunities and remaining challenges for the use of LNG for shipping. More importantly: the outcome helps us to feed a public debate on LNG for shipping and provides arguments for a stakeholder debate at local level." said Sandro Santamato, Head of Unit Maritime transport & Logistics, European Commission.

The study takes into account the overall EU policy aiming at reductions of emissions from shipping and looking for alternative energy sources, in view of growing constraints on the use of heavy fuels. It also summarises recent legislation: Firstly, the directive on sulphur content in marine fuels which allows the use of LNG as an alternative fuel to comply with more stringent emission standards. Secondly, the directive on deployment of alternative fuels infrastructure which aims at ensuring minimum coverage of LNG refuelling points in main maritime and inland ports across Europe by 2025 and 2030 respectively, with common standards for their design and use.

The study clearly shows that, on the one hand, the major motivation for stakeholders to engage in LNG as a shipping fuel is to be compliant with Emission Controlled Area zone requirements and the related positive environmental effects. On the other hand, the most critical issues for further deployment are the financing of LNG as a fuel and the pricing of LNG itself. For many companies, and especially shipping companies, LNG does not offer a profitable business model yet: the higher equipment costs for engines and tanks are not offset by savings in fuel or operating expenses. Also, the lack of existing bunkering infrastructure for LNG is another quite important barrier. For many companies, and especially shipping companies, LNG does not offer a profitable business model yet: the higher equipment costs for engines and tanks are not offset by savings in fuel or operating expenses. Also, the lack of existing bunkering infrastructure for LNG is another quite important barrier. The European Commission's Directorate-General for Mobility and Transport, PwC and DNV-GL are conducting the analysis and evaluation of the gaps that exist in the regulatory framework for LNG-fuelled ships and the provision of

LNG fuel. The research is focusing on risks and opportunities of using LNG as a shipping fuel.

The European Commission said in its statement that the final results of the study will become available in June/July 2015.

4 March 2015 Source: <http://www.lngworldnews.com/ec-industry-shows-support-for-use-of-lng-as-shipping-fuel/>

Figure 69 – Example blog post 1

Cost Burden Remains Key Hurdle in Wider Use of LNG in Shipping

The environmental advantages of using liquid natural gas as a shipping fuel are undisputed, but costs are high and there is doubt whether it makes business.

These findings were contained in the preliminary results of a **European Commission** study that examines the European Union's policies aimed at reducing emissions from shipping and finding alternative energy sources given growing constraints on the use of heavy fuels.

A 2012 directive on sulphur content in marine fuels allowed the use of LNG as an alternative to comply with more stringent emission standards.

According to the findings, the major motivation for stakeholders to engage in LNG as a shipping fuel is to be compliant with **Emission Controlled Area (ECA)** zone requirements and the related positive environmental effects, reported American Shipper.

For many shipping companies LNG does not yet offer a profitable business model due to higher equipment costs for engines and tanks that are not offset by savings in fuel or operating expenses. Another barrier to implementation is the lack of existing bunkering infrastructure for LNG.

"This study gives us a solid overview of the opportunities and remaining challenges for the use of LNG for shipping," said maritime transport logistics unit chief at the European Commission, Sandro Santamato.

"More importantly, the outcome helps us to feed a public debate on LNG for shipping and provides arguments for a stakeholder debate at local level." The study, due to become available in June, is being conducted by the **European Commission's Directorate-**

General for Mobility and Transport, PwC and DNV-GL.

9 March 2015 Source: [\[xp.blogspot.nl/2015/03/090315ensea-cost-burden-remains-key.html\]\(http://ram-xp.blogspot.nl/2015/03/090315ensea-cost-burden-remains-key.html\)**](http://ram-</p></div><div data-bbox=)**

Figure 70 – Example blog post 2

European Commissions' study on LNG as a shipping fuel shows industry's support

The European Commission presented the preliminary results of a study on the perception of the risks and opportunities of LNG as a shipping fuel. The results show that stakeholders recognise the environmental advantages of LNG as a shipping fuel, but are still uncertain whether they offer a clear business case. At the meeting, held during the European Shipping Week, the European Commission discussed with LNG industry stakeholders the outcomes of the study.

"This study gives us a solid overview of the opportunities and remaining challenges for the use of LNG for shipping. More importantly: the outcome helps us to feed a public debate on LNG for shipping and provides arguments for a stakeholder debate at local level." said Sandro Santamato, Head of Unit Maritime transport & Logistics, European Commission.

The study takes into account the overall EU policy aiming at reductions of emissions from shipping and looking for alternative energy sources, in view of growing constraints on the use of heavy fuels. It also summarises recent legislation: Firstly, the Directive on sulphur content in marine fuels (2012/33/EU) which allows the use of LNG as an alternative fuel to comply with more stringent emission standards. Secondly, the Directive on deployment of alternative fuels infrastructure (2014/94/EU) which aims at ensuring minimum coverage of LNG refuelling points in main maritime and inland ports across Europe by 2025 and 2030 respectively, with common standards for their design and use.

Environmental advantages remain undisputed, despite a lack of profitability

From the study it becomes clear that on the one hand, the major motivation for stakeholders to engage in LNG as a shipping fuel is to be compliant with Emission Controlled Area (ECA) zone requirements and the related positive environmental effects. On the other hand, the most critical issues for further deployment are the financing of LNG as a fuel and the pricing of LNG itself. For many companies, and especially shipping companies, LNG does not offer a profitable business model yet: the higher equipment costs for engines and tanks are not offset by savings in fuel or operating expenses. Also, the lack of existing bunkering infrastructure for LNG is another quite important barrier.

More about the study

The European Commission's Directorate-General for Mobility and Transport (DG MOVE), PwC and DNV-GL are conducting the analysis and evaluation of the gaps that exist in the regulatory framework for LNG-fuelled ships and the provision of LNG fuel. The research is focusing on risks and opportunities of using LNG as a shipping fuel.

4 March 2015 Source:

<http://intercontinenttrading.blogspot.nl/2015/03/european-commissions-study-on-lng-as.html>

Figure 71 – Example blog post 3

European Commissions' study on LNG as a shipping fuel shows industry's support

The European Commission presented the preliminary results of a study on the perception of the risks and opportunities of LNG as a shipping fuel. The results show that stakeholders recognise the environmental advantages of LNG as a shipping fuel, but are still uncertain whether they offer a clear business case. At the meeting, held during the European Shipping Week, the European Commission discussed with LNG industry stakeholders the outcomes of the study.

"This study gives us a solid overview of the opportunities and remaining challenges for the use of LNG for shipping. More importantly: the outcome helps us to feed a public debate on LNG for shipping and provides arguments for a stakeholder debate at local level." said Sandro Santamato, Head of Unit Maritime transport & Logistics, European Commission.

The study takes into account the overall EU policy aiming at reductions of emissions from shipping and looking for alternative energy sources, in view of growing constraints on the use of heavy fuels. It also summarises recent legislation: Firstly, the Directive on sulphur content in marine fuels (2012/33/EU) which allows the use of LNG as an alternative fuel to comply with more stringent emission standards. Secondly, the Directive on deployment of alternative fuels infrastructure (2014/94/EU) which aims at ensuring minimum coverage of LNG refuelling points in main maritime and inland ports across Europe by 2025 and 2030 respectively, with common standards for their design and use.

Environmental advantages remain undisputed, despite a lack of profitability

From the study it becomes clear that on the one hand, the major motivation for stakeholders to engage in LNG as a shipping fuel is to be compliant with Emission Controlled Area (ECA) zone requirements and the related positive environmental effects. On the other hand, the most critical issues for further deployment are the financing of LNG as a fuel and the pricing of LNG itself. For many companies, and especially shipping companies, LNG does not offer a profitable business model yet: the higher equipment costs for engines and tanks are not offset by savings in fuel or operating expenses. Also, the lack of existing bunkering infrastructure for LNG is another quite important barrier.

More about the study

The European Commission's Directorate-General for Mobility and Transport (DG MOVE), PwC and DNV-GL are conducting the analysis and evaluation of the gaps that exist in the regulatory framework for LNG-fuelled ships and the provision of LNG fuel. The research is focusing on risks and opportunities of using LNG as a shipping fuel.

Final results of the study will become available in June/July 2015.

9 March 2015 Source: <http://maritime-connector.com/news/general/european-commissions-study-on-lng-as-a-shipping-fuel-shows-industry-s-support/>

Figure 72 – Example blog post 4

Pireo: il 28 maggio il convegno "LNG for shipping: risks and opportunities"

(FERPRESS) – Bruxelles, 22 MAG – Si terrà ad Atene il prossimo 28 maggio il convegno "LNG for shipping: risks and opportunities". L'incontro, organizzato dal Directorate-General for Mobility and Transport (DG MOVE) della Commissione europea, si svolgerà nell'ambito dell'European Maritime Day 2015, in programma al Pireo il 28 e 29 maggio 2015.

Nel corso dell'incontro saranno presentati i risultati dello studio, realizzato da DG MOVE, in collaborazione con PriceWaterhouseCoopers e DNV-GL, sulla percezione dei rischi e delle opportunità dell'uso di LNG come combustibile nel trasporto marittimo.

Appuntamento a partire dalle ore 11 presso l'Athens Concert Hall (Megaron Mousikis) del Pireo. Per maggiori informazioni.

22 May 2015 Source: <http://www.ferpress.it/pireo-il-28-maggio-il-convegno-lng-for-shipping-risks-and-opportunities/>

Figure 73 – Example blog post 5

A list of selected clippings of the first press release among traditional media:

- **An EIB Perspective on the European Commission Dire...**
10-Jun-2015 in europeanenergyinnovation.eu » Society: Economics News, European Union News [link](#)
- **Study: Using LNG Bunkers in the Arctic Could Great...**
3-Jun-2015 in www.shipandbunker.com » Regional: Arctic News [link](#)
- **Skangass Tops Out Pori LNG Terminal**
27-Apr-2015 in www.worldmaritimeneews.com » Regional: Finland News [link](#)
- **Challenges to Barcelona Port's Third Strategic Plan**
23-Apr-2015 in www.marinelink.com » Regional: Spain News [link](#)
- **Challenges to Barcelona Port's Third Strategic Plan**
23-Apr-2015 in www.maritimeglobalnews.com » Regional: Spain News [link](#)
- **Shell to buy BG Group in \$70 billion energy deal**
10-Apr-2015 in www.onlinetes.com » Business: European News, Uk News [link](#)

- **Energy News Roundup: Shell Complete BG Takeover, E...**
10-Apr-2015 in www.einnews.com » Business: European News, Uk News [link](#)

- **Energy News Roundup: Shell Acquires BG for \$70B, E...**
9-Apr-2015 in breakingenergy.com » Business: European News, Uk News [link](#)

- **Energy Chamber concerned about local assets**
9-Apr-2015 in www.guardian.co.tt » Business: Latest [link](#)

- **Will the shipping industry switch to LNG?**
11-Mar-2015 in www.processingmagazine.com » Society: European Union News [link](#)

- **Belgian: Shipping Industry proclaims European Ship...**
10-Mar-2015 in www.bymnews.com » Society: European Union News [link](#)

- **Shipping industry proclaims European Shipping Week...**
10-Mar-2015 in www.allaboutshipping.co.uk » Society: European Union News [link](#)

- **Shipping industry proclaims European Shipping Week...**
10-Mar-2015 in www.shipmanagementinternational.com » Society: European Union News [link](#)

- **Shipping industry proclaims European Shipping Week...**
10-Mar-2015 in www.safety4sea.com » Society: European Union News [link](#)

- **Shipping industry proclaims European Shipping Week...**
9-Mar-2015 in www.hellenicshippingnews.com » Society: European Union News [link](#)

- **Cost burden remains key hurdle in wider use of LNG...**
9-Mar-2015 in www.shippingtribune.com » Society: European Union News [link](#)

- **Study: Shipowners Still Unsure of the Business Cas...**
8-Mar-2015 in www.shipandbunker.com » Business: Latest [link](#)

- **Cost burden remains key hurdle in wider use of LNG...**
8-Mar-2015 in www.seanews.ru » Society: European Union News [link](#)

- **Shipowners Still Not Sold on LNG**
6-Mar-2015 in www.turkishmaritime.com.tr » Industry: Oil And Gas News, Energy News [link](#)

- **Commission reports on industry LNG concerns**
5-Mar-2015 in www.motorship.com » Society: European Union News [link](#)

- **Shipowners Still Not Sold on LNG**
4-Mar-2015 in www.worldmaritimenews.com » Industry: Oil And Gas News, Energy News [link](#)
- **Study on LNG as shipping fuel highlights industry ...**
4-Mar-2015 in www.lngindustry.com » Industry: Shipping News, Oil And Gas News, Energy News [link](#)
- **EC Study on LNG as Shipping Fuel Reveals Industry ...**
4-Mar-2015 in www.marinelink.com » Society: European Union News [link](#)
- **EC: industry shows support for use of LNG as shipp...**
4-Mar-2015 in www.lngworldnews.com » Society: European Union News [link](#)
- **European Commissions' study on LNG as a shipping f...**
3-Mar-2015 in www.bunkerportsnews.com » Society: European Union News [link](#)
- **European Commissions' study on LNG as a shipping f...**
3-Mar-2015 in www.hellenicshippingnews.com » Society: European Union News [link](#)
- **European Commissions' study on LNG as a shipping f...**
3-Mar-2015 in www.shipmanagementinternational.com » Society: European Union News [link](#)

A list of selected clippings of the first press release among new media:

- **European Commission study shows industry support.**
04-Mar-2015
[www.americanshipper.com/Main/News/European Commission study shows in dustry support f 59614.aspx?source=Little4#hide](http://www.americanshipper.com/Main/News/European_Commission_study_shows_in_dustry_support_f_59614.aspx?source=Little4#hide)
- **LNG shipping fuel study shows industry report.**
04-Mar-2015 <http://www.lngindustry.com/lng-shipping/04032015/LNG-shipping-fuel-study-shows-industry-support-357/>
- **EC industry support for use of LNG as shipping fuel.**
04-Mar-2015 <http://www.lngworldnews.com/ec-industry-shows-support-for-use-of-lng-as-shipping-fuel/>
- **Cost burden remains key hurdle in wider use of LNG in shipping.**
09-Mar-2015 <http://ram-xp.blogspot.nl/2015/03/090315ensea-cost-burden-remains-key.html>
- **European Commissions' study on LNG as a shipping fuel shows industry's support.**
04-Mar-2015 <http://intercontinenttrading.blogspot.nl/2015/03/european-commissions-study-on-lng-as.html>

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April 2015 Issue

Haliade 150 Turbines For Deepwater Wind Farm

Alstom (Levallois-Perret, France) has received formal notice to proceed (NTP) from developers of the Deepwater Wind project, which is poised to become America's first commercial offshore wind farm. It will feature five Alstom Haliade 150 6-megawatt offshore wind turbines.

The turbines, capable of producing approximately 125,000 megawatt-hours of electricity annually, will provide about 90 percent of Block Island's power needs.

Located about 3 miles off the coast of Block Island, Rhode Island, the Block Island Wind Farm is scheduled for commercial service in the fourth quarter of 2016.

Prime Safety Work Complete For Aibel on FPSO

Lloyd's Register Consulting (London, England) has completed prime safety work packages for Aibel (Stavanger, Norway) on the Vette front-end engineering and design contract for a cylindrical FPSO.

The safety contracts provided by Lloyd's Register Consulting for Aibel cover quantitative risk assessments, human factors, layers of protection analysis, functional safety, emergency preparedness, additional computational fluid dynamic studies, and flare studies using simulators to assess the flow dynamics of oil, gas and water in pipes and process equipment.

Vette is an oil field located 55 kilometers northwest of the Yme field in the North Sea. Production start up is estimated for 2019.

Funding Competition For Better Fuels

Innovate UK's funding competition for cleaner, more efficient conventional fuels is now open. A total of £6 million is available to support new technologies that improve efficiency, reduce cost and minimize the environmental impact of coal, natural gas and oil.

Of this fund, £4 million will be set aside for business-led, collaborative R&D projects ranging in size from £250,000 to £1.5 million. One million pounds will be available for smaller-scale feasibility studies. An additional £1 million is available through the National Environment Research Council (NERC) for the academic element of projects that fall within NERC-remit and support and focus on translation of existing research outcomes to meet industry issues and challenges.

The deadline for expressions of interest for collaborative R&D is noon on April 15. The deadline for feasibility studies is noon on June 10.

NERC is also planning a separate five-year £5 million Oil and Gas Innovation Program, with decommissioning as one of the key themes.

EC Study on Perceived LNG Risks, Opportunities

The European Commission (EC) has presented the preliminary results of a study on the perception of the risks and opportunities of LNG as a shipping fuel. The results show that stakeholders recognize the environmental advantages of LNG, but are still uncertain whether they offer a clear business case.

The study takes into account the overall EU policy aimed at reductions of emissions from shipping and the search for alternative energy sources in view of growing constraints on the use of heavy fuels.

The study shows that the major motivation for stakeholders to use LNG is to comply with Emission Controlled Area (ECA) zone requirements and the related positive environmental effects. The study also shows the most critical issues for further deployment are the financing and the pricing of LNG. For many companies, LNG does not offer a profitable business model yet. The lack of existing bunkering infrastructure for LNG is another important barrier, the study shows.

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Figure 74 – Further clippings: publication in Sea Technology Magazine (April 2015 edition) [[link](#)]

8.5. Event feedback form for stakeholder events

During the events, we distributed the event survey to assess what the overall opinion is around the events



EVENT FEEDBACK FORM

LNG for Shipping | European Shipping Week 2015
March 3, 2015

Dear participant of the event,

Thank you for attending our event LNG for Shipping. Please help us by taking a few minutes to tell us about your experiences you had today. We appreciate your feedback and would like to make sure that we meet your expectations throughout our LNG for Shipping platform.

Thank you for your contribution.

Kind regards, Axel von ~~Perrall~~ (PwC)

Where did you hear about this event?

- Direct invitation from PwC, DNV-GL or MSLGROUP
- Recommendation from colleagues or people from my network
- Via the European Shipping Week platform
- Social Media (Twitter,...)
- Other, namely ...

How would you rate the content/discussions of this event?

Excellent	Good	Fair	Poor
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How would you rate the speakers of this event?

Excellent	Good	Fair	Poor
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How would you rate this event overall?

Excellent	Good	Fair	Poor
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Would you recommend this event to others?

Yes	No	Maybe
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Are there any comments about this event that you like to share with us?

Figure 75 – Event feedback form

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