European Commission
DG Energy (ENER.B.4, ENER.A.3)
Ref: Consultation on an EU strategy for liquefied natural gas and gas storage
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Submitted via e-mail

Dear Sir, Madame,

On behalf of Wärtsilä Corporation, we welcome the opportunity to provide a response to the consultation on an EU strategy for liquefied natural gas and gas storage.

Wärtsilä is a global leader in complete lifecycle power solutions for the marine and energy markets. In 2014, Wärtsilä's net sales totalled EUR 4,779 million with approximately 17,700 employees. The company has operations in more than 200 locations in nearly 70 countries around the world. Wärtsilä is listed on Nasdaq Helsinki, Finland.

Wärtsilä is the world-leading ship design company in the field of gas-fuelled special vessels. For liquefied natural gas (LNG) applications Wärtsilä has the widest engine range in the industry and furthermore can offer fuel gas handling systems. There are currently 258 vessels, primarily LNG carriers, for which Wärtsilä has delivered or sold Wärtsilä dual-fuel engines running on LNG. Wärtsilä's LNG technology provides high efficiencies even in part-loads with very low emission levels. LNG fuelled ships are compliant with future IMO Tier III requirements without any other emission reduction measures.

Wärtsilä offers an extensive range of LNG-related products and solutions for both onshore and offshore markets. As a global EPC (Engineering, Procurement and Construction) contractor we can deliver everything from selected products and technologies to complete turn-key solutions. Our global service network provides operation and maintenance support to ensure reliable operations and optimized performance of LNG installations. By developing and delivering LNG infrastructure projects, Wärtsilä contributes to a cleaner and more sustainable energy infrastructure.

Our key products and solutions include multi-fuel combustion engines and LNG fuel systems for power plants and vessels, mini to small scale LNG or liquefied biogas (LBG) liquefaction plants, small to medium-scale LNG receiving and distribution terminals, regasification and re-liquefaction systems and automation and process design of LNG and gas systems.

Below we provide a response to most of the questions raised in the Commission consultation document. We have chosen not to provide answers to all questions raised, but to provide input only to those most relevant for Wärtsilä.

Question 1:

Wärtsilä supports Commission's assessment on infrastructure development challenges. There are only a few LNG bunkering stations in Europe, located mainly in Norway. It would be beneficial to start building the LNG infrastructure in key areas such as the North Sea, the English Channel, the Baltic Sea and the Mediterranean, where the routes are in active use. This would not only improve security of supply, but also

support short sea shipping and emission reduction targets in critical areas.

Question 2:

Local conditions are an important aspect to take into account when measuring how cost-efficient different solutions are. A decision whether to invest in a pipeline or a LNG terminal should be made according to the circumstances specific to each investment decision. There is no universal template that could be applied to determine which one of the two alternatives would be the most cost-efficient.

In general it could be said that installation of new pipelines makes sense for large and constant volumes of gas, while new LNG terminals or storage centers are more feasible for smaller and more interruptive consumption. As gas will be used more and more as a back-up fuel in power generation, for example to balance intermittent renewables, it might make more sense to invest in new terminals that are closer to consumers, than pipelines. Moreover, with regard to overall security of the energy system, a decentralized and disconnected gas storage system is probably safer than an interconnected pipeline.

Question 4:

Despite the enormous resources available around the world, natural gas is too expensive in Europe. As the market price for electricity is low, using gas for base load electricity production is no more feasible. Large Combined Cycle Gas Turbines, which used to be huge consumers of gas, have reduced their running hours, resulting in a reduced use of gas. To avoid stranded LNG assets, the price of LNG has to be cost-competitive compared to other fossil fuels.

Renewable energy, typically converted to electricity, will need a back-up system. Use of gas as a back-up fuel should be supported and promoted while letting gas to compete on its own merits for base load usage. The potential of gas as an enabler of the increased usage of renewables, storing energy and backing up intermittent generation when needed, should be seen as a solution to facilitate the European energy transition.

In addition, the potential of gas as transport fuel should be fully exploited. At the moment gas is not sufficiently available as a transport fuel, preventing new investments from emerging.

Question 5:

Greenhouse gas emissions from gas are lower than those from oil and coal. In that respect, gas is the ideal fuel to complement and support renewable energy. Gas has also a central role to play in ensuring energy security. Especially in the Nordic countries the cold winter requires long periods of alternative energy sources.

Not only does gas lower GHG emission and enable renewables but it can also improve the total efficiency of the system and bring financial benefits. System optimization is therefore a key aspect when designing a cost-efficient balance in the European energy mix.

Question 6:

In order to use the full potential of LNG in ensuring security of energy supply and offering an alternative sustainable fuel to transport, regulations, including safety and emission regulations, should be harmonized in the European level, and preferably globally. Currently the unclear or missing rules create uncertainty amongst the stakeholders in the LNG value chain.

Harmonized regulations should be clearly outlined and adopted with discipline to allow for the making of technology and investment choices today. Regulation should:

- Seek a level playing field

- Set goals, not define the means
- Be transparent and predictable
- Take into account that more stringent and interlinked regulations require system level analysis of their impact

Question 7:

The large initial investment costs needed to make LNG available together with the investments in machinery to burn LNG are a major problem. In order to incentivize the investments needed, the long-term supply of LNG should be ensured, together with sufficient volumes and long-term consumers. Stable regulatory framework and clear long-term policies that lower the risks for long-term investments are prerequisites for LNG infrastructure investments.

Question 8:

The major obstacle inhibiting the uptake of LNG in the maritime transport sector is the lack of infrastructure. Currently available big LNG terminals are mainly for gas import. Ships have limited ability to obtain LNG fuel because of the missing small and medium sized infrastructure for storage and distribution, and because of lack of competition between gas providers. This is the primary reason for the very low uptake of LNG fuelled ships.

Sufficient LNG infrastructure, including storage and bunkering facilities, is key in using the full potential of LNG in enhancing supply security and to facilitate the uptake of alternative sustainable fuels in the transport sector. Therefore, Wärtsilä proposes that the European Commission would further examine, as part of the preparation of the LNG strategy, the necessary measures to develop sufficient LNG infrastructure. This exercise should identify the structure of the most effective and cost-efficient LNG network meeting the EU policy requirements on sustainable maritime transport industry and secure, sustainable and competitive energy system. The following elements could be assessed:

- Identification of optimum gas network for both shipping and land-based needs allowing flexible use of gas (locations, capacity, infrastructure, gas network, LNG terminals, storage, distribution, refuelling)
- Commercial feasibility
- Identification of key players
- Time-frame

The outcomes of the assessment could serve as a useful background when identifying necessary steps in developing European gas system and in facilitating market development for LNG in the EU and with its trade partners.

Question 9:

More LNG suppliers will come online which will keep the costs of LNG down. Small scale LNG is a fairly new concept with active ongoing product development, bringing down the costs of LNG handling. At the same time demand and prices of oil and coal will decrease, meaning that gas-related investment decisions will not be taken on economical basis alone, but will require environmental legislation or taxes to support the decisions.

Question 11:

In normal operating conditions GHG emissions of a LNG fuelled vessel are lower compared to similar HFO fuelled vessels. Moreover, there are remarkable reductions of other hazardous emissions such as nitrogen oxide, sulphur oxide, and particles. Shipping is already now the most energy efficient and environmentally sound mode of transportation. Nevertheless, shipping accounts 3-4% of the global CO2 emissions, 4-9% SOx emissions and is forced to meet increasingly tightening environmental standards for engines and fuel. In that

perspective the use of LNG fuel provides an economical and environmental sound solution for shipping, especially in regional trade, operating in emission controlled or coastal areas.

Emission control areas like Northern Europe and North America will be the forerunners in promoting the utilization of gas, but as the infrastructure develops, the following areas will also have LNG as the preferred fuel before 2020: the rest of Europe, the Black Sea, the Australian coast line, Singapore-Malaysia, China, Japan and Korea. As gas bunkering becomes increasingly possible, other areas will follow. LNG for shipping will be available in the major operation areas and is competitively priced. For coastal traffic, gas will be the primary fuel. The flexibility to operate on liquid fuels will mostly be required for abnormal conditions or for the transfer of the vessel through areas where gas is not yet available.

For ocean-going vessels, liquid fuels will continue to play an important role in the future because of the ease of handling. Gas will be the fuel choice for regional trade and the compliant fuel for ocean-going vessels when approaching emission control areas (ECAs).

As the economics of using LNG are improving rapidly for both users and providers, and with its growing adoption, it is important to accelerate the initial stages of the uptake by, among other things, financing development of a LNG infrastructure:

- Financing scheme for terminals
- Financing scheme for feeder and bunker vessels
- Financing scheme for early adopting ship owners
- The taxation of LNG vs. other liquid fuels in certain countries needs to be clarified

With regard to safety regulations, it is utmost important to urgently harmonize the LNG bunkering regulations in ports. Currently the unclear or missing rules create uncertainty amongst the stakeholders in the LNG shipping value chain and lead to unreasonable demands for the sake of security. There are today existing and functioning rules, e.g., in Stockholm where the passenger vessel Viking Grace is bunkered. Safety regulations are urgently needed for bunkering, bunkering connections, emergency shutdown systems for vessel machinery, emergency release for LNG stored on board, data exchange and incident reporting.

Question 12:

There are many recognized environmental advantages in using gas as a fuel. When compared to heavy-fuel oil or diesel engines, modern gas engines contribute to an effective reduction of NOx, CO2 and other hazardous emissions in the exhaust gas without additionally installed expensive exhaust gas after treatment devices. Total greenhouse gas emissions are lower and technology is constantly being developed to reduce methane emissions even further.

Question 13:

As LNG is stored in a large thermos, it can't be stored for very long periods without heating up and need therefore a constant small utilization of the boil-off gas. Therefore it would make sense to combine the LNG storage with close-by consumers, such as a power plant that could utilize the boil-off gas. Reliquefying the boil-off gas is also possible, and even if it consumes more energy it would be a suitable alternative in some cases.

Question 14:

Natural gas in its natural form underground or as LNG above ground are today the cheapest ways of storing clean energy in large amounts. The need for storing energy is becoming more evident as more and more power is produced by intermittent renewable energy. LNG gives the possibility to store natural gas in the same way as oil and coal are stored. Thus, national regulations and support that have created the national diesel/petrol reserves could be copied to establishing LNG reserves. Instead of supporting of building new oil reserves, the support should be given only to building new LNG reserves.

Question 15:

A well-functioning network of LNG infrastructure is the key: Sufficient amount of LNG terminals connected to a gas grid would serve as a reserve on its own merit.

Question 18:

LNG storage infrastructure can be applied not only to the storage of liquefied natural gas but also to the storage of LBG. Once the availability of biogas increases, the existing LNG technology can be used for LBG. Gas and renewables are complimentary rather than competitors. Gas technology will enable the increasing use of intermittent renewables in the European energy system.