Consultation on an EU strategy for liquefied natural gas and gas storage

Answers provided by DVGW (Deutscher Verein des Gas und Wasserfachs e.V.)

1. LNG in the EU today

Question 1: Do you agree with the assessment for the above regions in terms of infrastructure development challenges and needs to allow potential access for all Member States, in particular the most vulnerable ones, to LNG supplies either directly or through neighbouring countries? Do you have any analysis or view on what an optimal level/share of LNG in a region or Member State would be from a diversification / security of supply perspective? Please answer by Member state / region

We share EUs assessment of infrastructure development and challenges.

Historically Spain, Portugal and Southern France were depending on LNG imports whereas North/West European countries like Germany focussed on pipeline gas imports. East European countries did not have the chance to build LNG infrastructure being influenced by the former UdSSR. This has resulted in a good coverage of Southern Europe with LNG import infrastructure.

The start of operations at the Gate terminal in Rotterdam in 2011 has increased the accessibility for continental North West Europe (NWE) gas companies to global LNG markets. The Dunkirk terminal in Northern France is under construction and will add additional capacity. Together with the Zeebrugge terminal this results in an import capacity of 25,4 mtpa for NWE which is estimated to be sufficient in the medium term. If an LNG downstream business (small scale LNG) will develop additional infrastructure will be required.

Recent developments with Poland's on shore terminal Świnoujście LNG and Lithuania's floating terminal Klaipėda LNG will increase security of supply on regional level in North Eastern Europe.

In last years price level for LNG in Europe was above piped gas as a result of high LNG demand in Asia/Pacific. There have been no commercial incentives to trigger additional investment in LNG import infrastructure as flow rates in exiting terminals and expectations for utilisation rates for new terminals were low.

For security of supply reason and high dependence on Russian gas we see as most critical areas

- Baltic States: Estonia, Latvia
- Northern Europe: Finland
- South East Europe: whole region
- NWE (to some extend)

We support the view of DG ENER to develop LNG import infrastructure in the Baltic region and the Baltic Interconnector to connect Finland and Estonia. The planed LNG terminal on the island of Krk in Croatia will support diversification of gas supplies in the South/East. From commercial point of view we see a main challenge in Russia's ability to undermine economics and competitiveness of LNG imports by offering lower pipeline gas prices.

A sound business case needs to be supported by LNG bunkering and distribution of LNG for use by remote industrial customers. This would allow to generate sufficient throughput and to reach economies of scale especially in regions with low overall gas demand.

We do not have country specific data on level of diversification. It is from our point of view more a question of optionality to have access to alternative supply sources which can be used if and when it is commercially attractive or in case of supply interruptions.

GIE states total regasification capacity (EU28) at 191 bcm/a with 23 bcm/a under construction. In relation to EU28 gas import of 409 BCM in 2014 there is sufficient LNG import infrastructure. It needs to be noted that regional insufficiencies as stated above remain.

Question 2: Do you have any analysis (cost/benefit) that helps identify the most cost-efficient options for demand reduction or infrastructure development and use, either through better interconnections to existing LNG terminals and/or new LNG infrastructure for the most vulnerable Member States? What, in your view, are reasons, circumstances to (dis)favour new LNG investments in new locations as opposed to pipeline investments to connect existing LNG terminals to those new markets?

We do not have specific data relating the first part of the question.

Investments in new LNG infrastructure will be handled on company level. To trigger an investment in new LNG regasification and distribution

infrastructure a sound commercial and legal framework needs to be in place. This includes

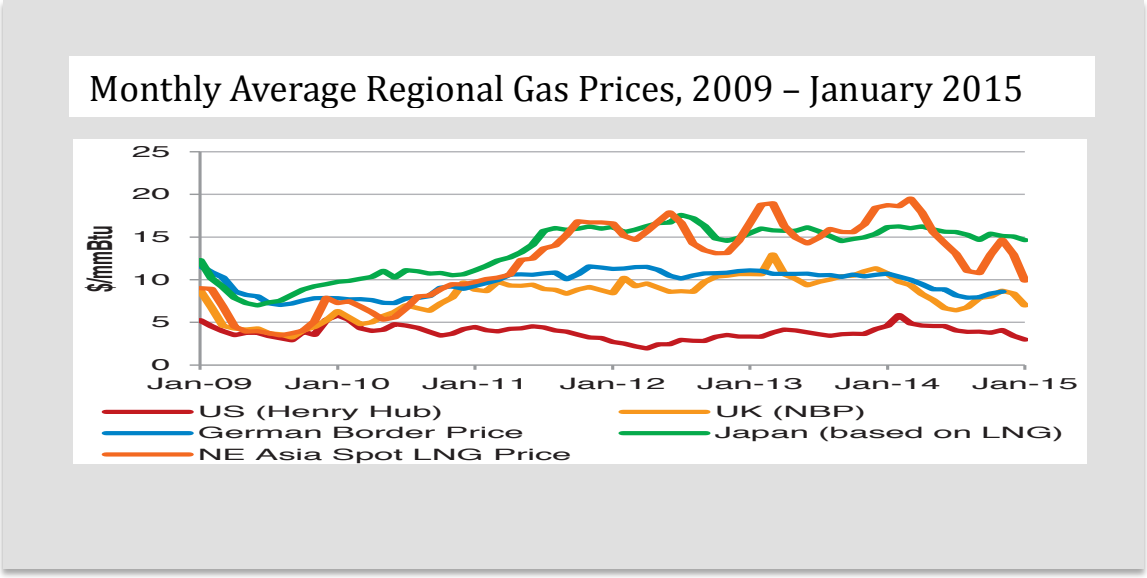
- Stringent and fast approval and permitting processes on national, regional and local level
- Easy accessibility of main gas grid at non discriminatory terms and conditions
- Exemption from regulation and ability to market capacity under long term capacity throughput agreements
- Project and equity financing which requires long term utilisation agreements to make projects bankable

Question 3: Do you think, in addition to the already existing TEN-E Regulation, any further EU action is needed in this regard? Do you think the use of LNG gas and existing LNG infrastructure could be improved e.g. by better storage possibilities, better network cooperation of TSOs or other measures? Please give examples

DVGW is not an operating company. From more general point of view key for optimal use of existing pipeline and storage infrastructure is a non discriminatory access to such services. EU should ensure that TEN-E regulation is enforced.

Question 4: What in your view explains the low use rates in some regions? Given uncertainties over future gas demand, how would you assess the risk of stranded assets and lock-in effects (and the risk of diverting investments from low carbon technologies such as renewables and delaying a true change in energy systems) and weigh those against risks to gas security and resilience? What options exist in your view to reduce and/or address the risk of stranded assets?

Figure 1 shows the development of global gas prices until early 2015 (source IGU).



In the past markets in Asia/Pacific especially Japan and Korea were willing and able to accept long term LNG import contracts with price levels significantly above European gas prices. Most of such contracts are oil indexed. There was no incentive for traditional LNG exporters like Qatar, Nigeria or Algeria to market LNG to Europe at lower prices or with another indexation. Developments on the LNG short term market were even more extreme as LNG spot prices in Asia/Pacific were in some deals double compared to European gas price levels.

A phenomena which has resulted from such price differential was reloading of imported but not regasified LNG volumes from LNG regasification terminals and marketing of such volumes to buyers offering significant price differentials. IGU has stated in its latest report a figure of 6.4 mt for re-exports from Europe in 2014

Current energy policy which disincentives fossil fuels including LNG/natural gas does not support investment in new and additional infrastructure. In the case of LNG/natural gas commitments on political level are necessary to support LNG/natural gas as fuel for power generation, for heating purposes and for use in transport at least for a bridging period. LNG/natural gas should be acknowledged as bridging technology for next three to four decades to support the path to an energy system using less and only low carbon fossil fuels. Without clear statements and support for natural gas we see a significant risk for

investments in new gas infrastructure. Further more we foresee negative effects for use of LNG in transport as synergies between large scale LNG import and downstream LNG distribution (small scale LNG) can not be used.

Question 5: The Energy Union commits the EU to meeting ambitious targets on greenhouse gas emissions, renewable energy and energy efficiency, and also to reducing its dependency on imported fossil fuels and hence exposure to price spikes. Moderating energy demand and fuel-switching to low carbon sources such as renewables, particularly in the heating and cooling sector, can be highly cost- effective solutions to such challenges, and ones that Member States will wish to consider carefully alongside decisions on LNG infrastructure. In this context, do you have any evidence on the most cost- efficient balance between these different options in different areas, including over the long term (i.e. up to 2050)?

By considering all external effects (e.g. greenhouse gas emissions, particulates) power generation by gas utilisation is an environmental friendly method. It is hardly possible to value all external effects in use of different energy sources and to find a solid data base. From a more generic point of view natural gas will have to play a role in the energy mix in Europe in next decades. We see gas as a bridging technology for next 30 – 40 years on the way to come to a fossil free energy world.

2. Potential entry barriers for LNG

Question 6: What in your view are the most critical regulatory barriers by Member State to the optimal use of and access to LNG, and what policy options do you see to overcome those barriers? Have you encountered or are you aware of any problems in accessing existing LNG terminal infrastructure, either because of regulatory provisions or as a result of company behaviour? Please describe in detail.

DVGW is not an operating company and not actively importing LNG. Our view is that non discriminatory and transparent access to LNG import terminals and the connecting pipeline grid as well as to other necessary infrastructure and services (e.g. gas storage, nitrogen ballasting and others) is essential.

To justify investments in expensive LNG infrastructure investors and financing banks need a long term horizon and long term capacity and throughput commitments to back the investments and to allow project financing. For new projects an exemption from regulation should be

granted to enable to market storage and regasification capacity in an open season process on a long term basis to several customers. Multi customer operating models for storage and regasification of LNG should be applied to enhance accessibility.

For operating terminals it is essential to provide secondary marketing of non used capacity to third parties (UOLI).

EU could think about an active support of a secondary market for LNG storage and regasification capacity and of monitoring terminal operating models to allow maximum use of terminal capacity and implementation of multi client models and borrowing and lending mechanisms.

Question 7: What do you think are the most critical commercial, including territorial restrictions and financial barriers at national and regional level to the optimal use and access to LNG?

Low LNG flows into Europe were to a large extent price driven. In the past the global LNG market and price developments have not supported LNG flows into European markets. LNG priced on oil indexation as well as spot LNG was not competitive against imported pipeline gas especially in NWE. Low demand and high availability of volumes have resulted in low gas prices (reference point TTF, NBP, NCG and other European hubs) in Europe. On the other end a shortage of LNG supplies following the shutdown of nuclear power generation in Japan and growing demand in other Asia/Pacific countries resulted in all time highs for LNG prices reaching 20 USD/mmbtu (spot market). In addition LNG players have reloaded and re-exported LNG volumes from Europe to market such quantities at higher prices in Asia/Pacific or South America.

In LNG trading financial guarantees from buyers are common and required. Taking into account the value of an individual cargo being in the range of 30 Mio. USD to above 100 Mio. USD depending on LNG price and volume smaller and financially less sound companies will have difficulties to participate in such market. Same applies to term contracts.

Question 8: More specifically, do you consider that ongoing EU policy initiatives and/or existing legislation can adequately tackle the outstanding issues, or there is more the EU should do?

In the past destination clauses in long term LNG supply contracts were most common. EU has addressed this. We believe that a flexible market driven by commercial incentives is the most efficient way to improve

security of supply.

3. International LNG markets

Question 9: How do you see worldwide LNG markets evolving over the next decade and what effects do you expect this to have on EU gas markets? Do you expect a shift away from oil-indexed LNG contracts, and if so under what conditions?

The global LNG market will see fundamental changes in the next few years. There will be a significant addition of new liquefaction capacity. As of Q1 2015 about 128 mtpa of capacity are under construction. The major contributors are the US with 44 mtpa of capacity under construction reaching markets from 2016 onwards and Australian projects with adding about 57 mtpa of capacity mainly targeting Asia/Pacific markets. Possible additional projects in the US, Western Canada, East Africa and Russia could provide even more liquefaction capacity in the medium to long term. Forecasts see a doubling of capacity from 300 mtpa today to above 600 mtpa in next 10-15 years. Current oil price development will delay projects for a short period in time but most likely not change the overall picture.

LNG prices especially in Asia/Pacific are reaching European gas price levels. Nevertheless as Europe has supply alternatives Europe will remain to be the second market after Asia/Pacific and act as a sink for LNG if and when gas prices determine.

Another effect is the shift from oil indexation in LNG supply contracts to gas indexation like Henry Hub. This will give buyers a choice and allow to reduce price risks. LNG supply and purchase contracts will become more flexible. US LNG producers offer LNG on FoB (free on board) basis enabling the buyer to market such volumes globally.

Overall the ability of European gas importers to buy LNG at competitive conditions will increase and we expect a higher flow of LNG to European destinations in the medium to long run.

Question 10: What problems if any do you see with the functioning of the international LNG market, particularly at times of stress? Are there specific actions the EU should take, in dialogue with our international partners, including in trade negotiations, to improve its functioning and/or to make the EU market more attractive as a destination for LNG? Could voluntary demand aggregation be helpful in some way?

Long term contracts for import of LNG would provide a high level of security. Aggregating demand and a strong financial position would support LNG imports as this would reduce marketing risk on sellers side and support their investments and bankability of projects.

Aggregation could support LNG imports especially in regions with low overall gas demand.

As LNG is other than piped gas flexible an LNG producer will always opt for the best available price on a short term market as well as under a long term perspective. Next to price it is important to have financially sound buyers who are in a position to back LNG liquefaction investments.

4. LNG technology issues including LNG use in transport

Question 11: What technological developments do you anticipate over the medium term in the field of LNG and how do you see the market for LNG in transport developing? Is there a need for additional EU action in this area to reduce barriers to uptake, for example on technology or standards, including for quality and safety?

LNG technology for liquefaction, shipping and regasification is sound and proven. We do not expect technological break troughs with large effects on cost or efficiency along the LNG value chain.

The requirements on LNG quality have been already set out in the existing national and international codes and standards.

A new development is the distribution of LNG from an import terminal into downstream markets and the use of LNG in the transport sector as fuel or as energy supply for remote industries.

The market in Europe is – with differences in individual member states – at the beginning and facing challenges to build a European wide LNG downstream infrastructure. Huge investments are required to build an infrastructure to make ship owners and logistic companies to switch to LNG. This can be described as a typical chicken and egg phenomena.

Regulation for use of LNG as a fuel should be designed to encourage market participants to change to LNG. Some examples are

- Introduction of CO2 tax in transport

- Granting tax advantages on LNG as a fuel
- Stringent access rules for heavy traffic for urban areas to reduce noise and particle emissions
- Direct subsidies to investments in infrastructure

A key challenge is to harmonize activities on small scale LNG in EU member states (time to market, safety rules, norms and standards). As road transport, sea- and inland shipping are to a large extend cross border activities interfaces between countries and market segments (road, sea, river) need to be managed. EU may consider to build a European platform for small scale LNG including all segments (sea, inland shipping, road transport) to allow exchange of knowledge and information and to coordinate activities.

5. LNG sustainability issues

Question 12: Do you think there are any sustainability issues specific to LNG that should be explored as part of this strategy? What would be the environmental costs and benefits of alternative solutions to LNG? Please provide evidence in support your views.

We do not see electrical power or hydrogen as technically feasible solutions to reduce GHG emissions in most segments of the shipping industry and for heavy road trucks in the next decades. Energy density of LNG is higher compared to its alternatives (see figure 2). Technology to use natural gas and LNG as fuel is proven and available. Furthermore the environmental benefits in using natural gas and LNG as fuel can be further improved by adding bio gas and bio LNG without need to add new and additional distribution and supply infrastructure.

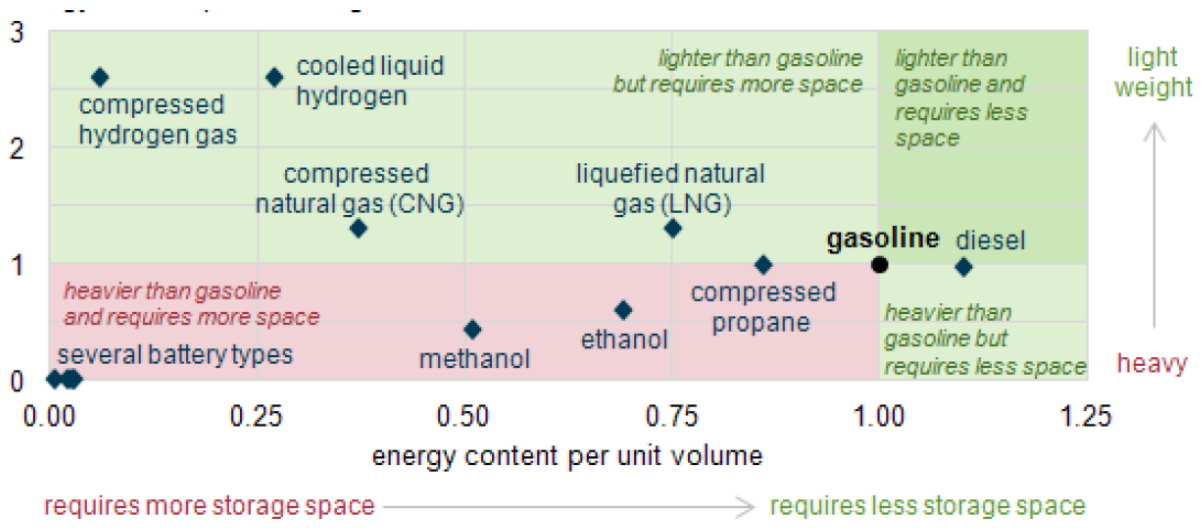


Figure 2: Energy density comparison of several transportation fuels (gasoline = 1) source US EIA.

Heavy-duty vehicles (HDV) - trucks and buses - are responsible for about a quarter of CO2 emissions from road transport in the EU and for some 6% of total EU emissions. Despite some improvements in fuel consumption efficiency in recent years, heavy duty vehicles' emissions are still rising, mainly due to increasing road freight traffic.

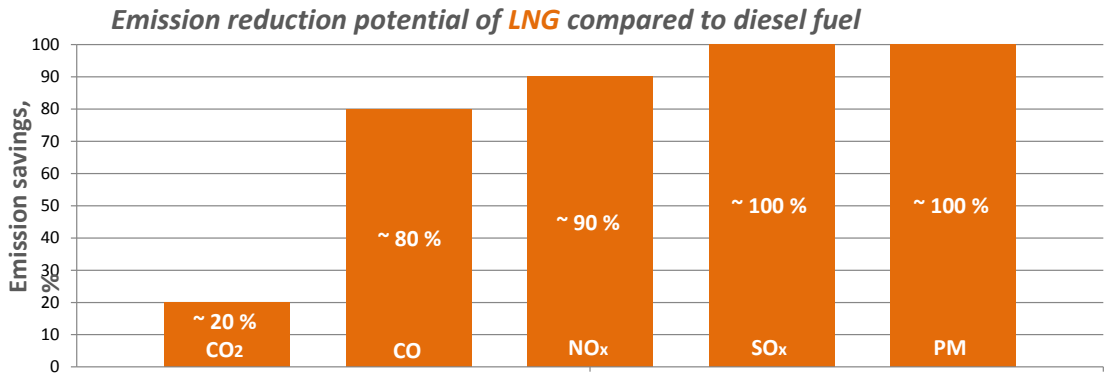


Figure 3: Savings of energy-specific GHG-emissions LNG vs. diesel

LNG is considered as a clean fuel. It poses no contamination danger to the soil, groundwater and surface water. In road transport, in comparison to conventional diesel, during combustion, LNG saves 15% - 20% CO2 emission. In sea cargo transport, in comparison to conventional fuel, LNG cargo has much lower SOx, NOx and particles emissions (at least 80%) (see figure 3).

Natural gas and LNG in power generation is a bridging technology supporting renewable energy sources. Gas fired power plants have very short response times to increased or reduced power demand. This makes gas-fired generation the most efficient way to accommodate sudden

changes in electricity demand or supply and the intermittent availability of renewable energy sources. Especially in Germany with an increasing share of renewables in the energy mix gas fired generation should play a key role.