



Stadtwerke München GmbH

Emmy-Noether-Straße 2
80992 Munich
Germany

Contact:

Johannes Frik

Phone: +49-89/23 61-6606

frik.johannes@swm.de

www.swm.de

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

Response Paper

Stadtwerke München GmbH (SWM)

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Stadtwerke München GmbH (SWM) is a multi-utility company owned by the City of Munich in Germany. Citizen value is a central theme for SWM. The company employs more than 8,600 employees and had a turnover of almost 6.1 billion Euros in 2014. It provides a range of utility services to approximately 1.1 million customers:

- Energy services: electricity, district heating and natural gas supplies;
- Water supply services and 18 municipal swimming pools; and
- Local transportation: subway, bus and tram services.

70% of SWM's power for the city of Munich is produced by combined heat and power (CHP) plants. The company has an ambitious renewable energy target: By 2025, SWM wants to cover all of Munich's consumption with renewable energy generated in its own plants. Munich intends to be the first city worldwide with more than one million inhabitants to reach this ambitious goal.

All in all, we will earmark a budget of 9 billion Euros for the expansion of renewable energies in the period until 2025.

We also offer our customers a reliable and reasonably priced supply of natural gas. From 2020, SWM is aiming to be the first German supply company to cover the consumption of all its private and business customers with natural gas from its own sources. In partnership with Bayerngas GmbH, SWM founded Bayerngas Norge to achieve this goal. Bayerngas Norge AS currently holds over 60 licenses.

This strategy will increase our leeway to pursue an independent pricing and product policy. We ensure greater independence from international oil and gas companies and a reliable and reasonably priced supply for the future.

According to national law, the electricity and gas network is legally unbundled in the SWM Infrastruktur GmbH.

General Comments:

- Today's LNG infrastructure in Europe is the result of past gas infrastructure development in European Member States. For south west European Member States gas supply solely based on pipeline imports was economically not feasible. Cross border connections between member states in central and northern Europe were developed to connect exploration sites in Norway, the Netherlands and Russia with areas of high demand. This development was based on long term contracts between suppliers and consumers. Even if certain infrastructures were subject to public funding, today's gas infrastructure was primarily set up by private companies. Thereby securing gas supply with gas storages in areas of high demand was of high significance.
- The liberalisation of energy markets led to a fundamental change in the different value-added segments. Integrated companies were replaced by several independent market participants (grid operator, trader, storage operator), whose interests are not always in line. Due to this development, costs for security of supply are not reflected adequately in today's commodity price system.
- We are convinced that natural gas will continue to play an important role in the EU energy system even during and after the transition to a low carbon future. Gas storage plays a key role for the well-functioning of the gas market and particularly serves as an important and indispensable backbone for security of supply.
- Given the shrinking domestic supplies and increased need for diversification of gas supplies to the European Union, we consider LNG and gas storage to be complementary to ensure a reliable and economically feasible gas supply mix in the future.
- As the diversification of gas supply by increasing LNG utilisation is seen necessary without doubt for diversification of European gas supplies, the utilization ratio of gas storage is deemed to be sufficient and comfortable availability is assumed for the future needs.
- However we see serious challenges in regard to keep well designed storage capacities available also in the future. This is reasoned by the following facts:

- Flexibility from LNG and pipeline gas will be available in parallel for a wider time period with declining indigenous production, leading to sufficient flexibility during normal demand situations.
 - Utilisation of gas storage will be reduced to the minimum as long as other flexible gas supplies are less costly.
 - LNG as well as pipeline gas cannot provide the same level of security of supply as gas storage; they stay dependent on sources located close to the demand in case of supply failure and peak demand situations.
 - Part time low utilisation of gas storages is not possible for a longer time period, as geological restrictions require filling storage sites and keep them pressurized frequently. Otherwise, the facilities has to be transferred into a save and stable situation by flooding them. This leads to irreversible capacity losses and not economical operation.
 - SSO's will have to reduce the facilities capacities until stable operation and sufficient refinance will be received. This might create shortfalls which cannot be compensated by further LNG and pipeline capacities.
- We believe that an economically feasible operation of necessary infrastructure (both LNG/pipeline and storage) can be achieved while cost increase for consumers can be limited. Simple measures within the legal and regulatory framework can avoid mothballing of storage sites and foster the efficient use and operation of pipeline infrastructure by fostering an equalized import flow ratio.
 - This could be achieved by seasonal transport tariffs for imports and adjusting additional transportation costs for the storage utilisation.
 - These measures reduce operational as well as investment costs within the pipeline system and ensure security of supply by adequate seasonal utilisation of gas storage instead of fostering flexible import ratios and design of the grid on maximum import flows.

Specific Questions:

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

In general we agree with the assessment for the above regions in terms of infrastructure development challenges.

Especially eastern Member States are highly dependent on Russian gas supplies. Yet, not all Member States do have the same infrastructural preconditions for an economic LNG-Import. Therefore there cannot be one single optimal level/share for all Member States. The usage of LNG should neither be determined to a specific share, nor be limited to Member States which are dependent on a small number of suppliers. LNG should be understood as an additional source of flexibility and diversification. LNG and alternative measures to increase security of supply, be it the implementation of cross border reverse flow capacities or new pipeline supply routes e.g. from the Yamal or Caspian area, should be investigated in a cost efficient measure.

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 generally believe that the efficient use of existing infrastructure should be prioritized against investments into new infrastructures.

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

Regasification capacities could offer more short term products to valorise the growing LNG spot market. Beyond that, we do not see the necessity of any further EU action in this regard.

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?

Worldwide, present regasification capacities are double the amount of capacities for liquefaction; hence a low degree of capacity utilization is currently to be expected. However, the current degree of capacity utilization does not prove any market failure or entry barriers but demonstrates the high flexibility of LNG prices following currently high price levels in international markets.

According to SWM scenarios gas demand in Europe will remain relatively stable in the medium term until 2035. Whereas indigenous production will decline, LNG will substitute indigenous production in Europe, while pipeline gas continues to contribute at the current level to meet demand.

Additionally we expect LNG export overcapacities in the future. These facilities run as long as variable costs are covered. Yet, LNG producers will find it difficult to recover full costs plus a return on investment.

This LNG export overcapacity alongside free regasification capacities in Europe and present overcapacities in Russia will lead to a continuing oversupply with gas in Europe till the end of the 2020s.

Therefore flexibility from LNG and pipeline gas will be available in parallel for a wider time period, leading to sufficient flexibility during normal demand situations. As a result, utilization of

gas storage will be reduced to the minimum as long as other flexible gas supplies are less costly.

But LNG as well as pipeline gas cannot provide the same level of security of supply as gas storage; they stay dependent on sources located close to the demand in case of supply failure and peak demand situations.

Part time low utilization of gas storage is not possible for a longer time period, as geological restrictions require filling storage sites and keep them pressurized frequently. Otherwise facilities have to be transferred into a save and stable situation by flooding them. This leads to irreversible capacity losses and not economical operation resulting in difficulties to secure supply in cases of peak demand or supply disruptions due to unforeseen political crisis.

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)?

Natural Gas will be one of the most versatile fuels of the future because of its scalability, reliability and efficiency as well as cleaner burning properties and competitive costs. A growing share of natural gas in the heating sector could support fuel switching to low carbon sources such as renewables like geothermal heat in the medium and long term. E.g. peak demand in district heating systems in urban areas based on renewable sources like geothermal heat could be met by gas heating stations. Furthermore natural gas should be considered as a reliable partner of an increasingly intermittent generation portfolio.

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.

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?

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?

Questions 6 to 8 are answered together.

There are still barriers existing for LNG and pipeline gas to reach certain regions in Europe. The focus should be on removing such barriers through improving interconnectivity and implementation of the Third Energy Package, the associated Network Codes and the Regulation on Security of Gas Supply. Existing EU legislation should be adequate to tackle the outstanding issues.

Completion of the Internal Energy Market is crucial for the efficient use of LNG terminals in Europe. We do not believe LNG terminal access conditions represent a problem as there is ample terminal capacity available and under construction. This development is at first the result of economic considerations.

In general, attractive and stable regulatory conditions should help the industry to build the infrastructures responding to a real market demand.

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?

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?

Questions 9 and 10 are answered together.

At the moment the worldwide share of LNG in gas demand is 10 %. In our view the worldwide LNG market will continue to grow and develop into a global market. New LNG export terminals in Australia and the US will lead to an increase on the supply side. We expect the worldwide LNG export capacities to double within the next decade. In Asia demand will continue to grow. We expect only long-term gas contracts to remain indexed to oil. We will further see LNG from the US in Europe indexed to Henry-Hub prices. The volume in spot markets will grow.

In our view LNG can play an important role in diversification of supply. Yet, it has to be considered, that a risk of supply disruptions is also given with LNG. Additionally LNG is in our view not suitable for short term reactions in cases of supply disruption. LNG is simply to be understood as a method of transportation of natural gas which due to its logistical flexibility helps improve security of supply. LNG as well as pipeline gas cannot provide the same level of security of supply as gas storage, they stay dependent on sources located close to the demand in case of supply failure and peak demand situations.

Until now the development of the global LNG market was basically driven by competition between private enterprises. Regulation for regional demand aggregation does not seem necessary. On the contrary, negative impacts on competition could be the result.

Nevertheless an exchange of position of points in dialogue with international partners on the political level could deem helpful for preparing commercial relationships.

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?

There are promising tests with LNG in the transport sector (e.g. heavy duty vehicles and shipping). Common European security standards for LNG in the transport sector could therefore be helpful. Additionally we see potential in small liquefaction terminals connected to offshore oil exploration.

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.

The growing interest of the shipping and transport sector in natural gas as well as LNG in particular dedicates potential to increase the usage of natural gas in this segment resulting in positive effects on air quality and CO₂-emissions. Alongside this development the dependence on oil in the transport sector could be reduced in parallel. Additionally the replacement of coal in the electricity production as well as oil in the heating sector by natural gas will have positive effects on air quality and CO₂-emissions as well.

Storage

Internal market constraints and challenges for storage

Question 13: What opportunities or challenges do the supply projections for different sources, in particular LNG and pipeline gas and low carbon indigenous sources, present for the use of gas storage / for gas storage operators?

We believe that with the decline of the indigenous production in North-West-Europe (NWE) and the replacement of indigenous production by LNG, storage facilities will play an even more significant role for security, affordability and sustainability issues.

In our view, the future role of gas storage has to be seen as complimentary to LNG rather than competitive. In order to use the existing LNG infrastructure more efficient, LNG supplies should

not only be seen as peak shaver in times of high demand. In fact, the use of gas storage would allow higher load factor of existing LNG terminals and more LNG volumes to be imported when (global) gas demand and prices are low.

Additional gas supplied by pipeline from ever more distant sources needs to be supplied at high load factor in order to use the related infrastructure more efficiently. The exposure of EU countries to supply disruptions (be it of technical or political nature) will increase with said imports.

Given the seasonality of gas demand, gas storage will therefore become even more important in the future to balance seasonal demand with base load pipeline supplies and LNG as well as to ensure security of supply.

With the continuous development of renewable energy sources we expect gas storage to play an even more important role in providing physical gas flexibility to gas-fired power plants used as a backup for intermittent RES or integrating biogas production and power to gas capacities into the system.

Question 14: Are, in your view, current market and regulatory conditions adequate to ensure that storages can fully play their role in addressing supply disruptions or other unforeseen events (e.g. extreme cold spells)?

The storage market is currently facing challenging times. Within the EUs internal gas market, incremental imports compete with storage withdrawal capacities, production flexibility and demand side measures. Winter/summer spreads, the main indicator used by storage users to value storage capacity, continue to remain at historically low levels. Gas price volatility, another value driver for storage capacity, has also decreased significantly. The current willingness to pay for gas storage capacity in some cases is already insufficient to cover the marginal cost of storage operations. Yet, storages are of major importance to meet peak demand on short notice and in case of supply disruptions.

In the German market, long-term storage contracts have so far made a great contribution to security of supply. Capacity charges for those contracts have to be considered as “sunk cost” by respective storage users and storage use can be valued against marginal cost only. Thus, to the extent such long-term contracts still exist, storage filling levels can be observed as being high in

spite of low winter/summer spreads as long as the marginal cost can be recovered by the storage user.

However, given the current market and regulatory environment for storage, storage capacities becoming available from expiring long-term contracts will only be subscribed at storage fees that are below the costs of storage operators to operate and maintain their facilities. In the mid-term we therefore expect significant storage capacity in Germany to be decommissioned. However, a significant reduction of storage capacities would lead to a reduction of the actual level of security of supply.

In order to ensure that gas storage can continue to play its key role in addressing unforeseen events such as supply disruptions or periods of extreme coldness, we believe that following market and regulatory conditions need to be improved:

- the full value of storage including the insurance value – be it through market-based instruments, strategic storage or storage obligations - and the system value should be adequately recognised,
- a level playing field between different flexibility sources should be ensured.

Question 15: As an alternative to mandatory reserves, how could market based instruments ensure adequate minimum reserves?

As an alternative to mandatory reserves, storage users could be commercially incentivized to keep adequate minimum gas reserves in storage. In a market like Germany where effective storage competition exists, the compensation to be paid to storage users shall be limited to the respective opportunity cost of keeping said minimum reserves in storage. Thus, the additional cost for keeping minimum reserves in gas storages can be considered to be either negligible (if the market already anticipates higher gas prices towards the end of winter) or a true indicator for the “insurance value” of gas storage (as price signals would rather have incentivised an early withdrawal).

Adjustments regarding the grid access regime for storage (e.g. transmission tariffs and availability of firm transport capacity) to ensure a level playing field in comparison to other

flexibility sources would generate further market incentives for the use of storage and, consequently, would offer potentials to further minimize opportunity costs of storage reserves.

Storage Infrastructure

Question 16: Do you have any analysis or view on what an optimal level/share of storage in a Member State or region would be? What kind of initiatives, if any, do you consider necessary in terms of infrastructure development in relation to storage?

When considering the optimal level/share of storage capacity the different exposure levels of Member States or regions to security of supply risks have to be duly taken into account. While there are Member States or regions where additional storage capacity might be required, we consider the current level of storage capacities in Germany as being adequate to ensure well-functioning of the market as well as security of supply.

Stress test as already performed in the context of the security of supply regulation could be an appropriate indicator to determine minimum storage levels.

As regards further initiatives in terms of infrastructure development in relation to storage, setting specific transmission tariffs for storage may be required to adequately reward the role of storage for security of supply and the efficient operation of the gas transmission system. We also believe that fostering seasonal equalized imports by specific seasonal tariffication of the grid would also enhance security of supply and reduce grid costs.

Question 17: Do you think, in addition to the existing TEN-E Regulation, any further EU action is needed in this regard?

In our view the regulatory framework of the TEN-E Regulation is sufficient for the coordination of priority corridors or projects of common interest.

Yet, we believe that the EU has to take further non regulatory action in facilitating complex cross border, storage or LNG projects which often involve multiple governments, regulators, transmission system operators and financial players under different legislative frameworks.

Question 18: Given uncertainties over future gas demand, how would you assess the risk of stranded assets (and hence unnecessary costs), lock-in effects, the risk of diverting investments from low carbon technologies such as renewables, delaying a transition in energy systems and how would you weigh those against risks to gas security and resilience? What options exist in your view to reduce the risk of stranded assets?

Given the current uncertainties of future gas demand and in order to limit the risk of stranded investments, we consider it most important that priority is given to the use of existing infrastructure before any investment in additional infrastructure is taking place. To that end, the regulatory framework for storage should be adjusted to explore the full value of storage including its insurance and system value.

Regulatory framework and potential barriers for storage

Question 19: What do you think are the most critical regulatory barriers to the optimal use of storage in a regional setting?

We see in level of transmission tariffs for storage and constrained grid access capacities for storage the most critical barriers to the optimal use of storage in the current regulatory framework:

In spite of the various benefits that storage provides to the network transmission tariffs for storage currently account for a significant part of the storage cost from a storage user's perspective. Thus, lowering transmission tariffs for storage accordingly would incentivise the use of storage.

Access of storage to the transmission grid in Germany is partly provided on an interruptible basis only or limited to a seasonal demand pattern. Hence, unconstrained access of storage to the transmission grid should be provided to ensure that storage users can compete on an equal footing with other flexibility sources.

In a regional setting, gas storages in one Member State can also positively affect the security of supply situation in neighbouring countries and consequently offer ample room for regional coordination. Yet, in order to guarantee that the full potential of storage facilities connected to multiple market areas can be efficiently used, the access of storage facilities to necessary cross-border capacities needs to be ensured.

Question 20: Do you think ongoing initiatives and existing legislation can tackle the remaining outstanding issues or is there more the EU could do? Do initiatives need to include additional issues further to the ones described here?

First and foremost, it is crucial that existing legislation is fully implemented and complied with before new initiatives are being launched. However, we acknowledge that certain adjustments of regulation 994/2010 may be required to reflect practical experience gained from the different implementation in Member States in the past (e.g. harmonization of the definition of “protected customers”).

As mentioned above, we still think the current regulatory environment does not sufficiently compensate the system value and insurance value of storages. This will lead to a decrease of storage facilities within the market, as the market price currently only reflects the arbitrage value of storage capacity. Hence, the national legislation should give further incentives to support the efficient and secure use of existing infrastructure assets within the European framework.

Question 21: Do you consider EU-level rules necessary to define specific tariff regimes for storage only or should such assessment be made rather on a national level in view of available measures able to meet the objective of secure gas supply?

Entry and exit tariffs from the transmission system into and from storages significantly impact the economics of the use of these storages compared to alternative flexible supplies. Such entry and exit tariffs should generally be established based on the principles of non discrimination and creating a level playing field for flexible supply sources.

In a multiple TSO market area environment like in Germany it has to be ensured that the tariff level of the respective TSOs within a single market area is harmonized so as to avoid any market distortion in the storage market. These adjustments should be made on national level so that national characteristics can be taken duly into account.

Question 22: Have you ever encountered, or are you aware of, difficulties in accessing storage facilities? Has this concerned off-site or on-site storage facilities? Please describe the nature of the difficulties in detail.

We are not aware of difficulties in accessing storage facilities.

Question 23: Have you ever encountered, or are you aware of, difficulties related to feeding LNG gas from the storage site back into the gas network? If so please describe the nature of these difficulties (regulatory provisions, company behaviour, technical problems) in detail.

We are not aware of difficulties related to feeding LNG gas from the storage site back into the gas network.