



2018

Workshop Series on

Key drivers to promote the liquidity, flexibility and transparency of the global Liquefied Natural Gas market

Co-organised by
the Ministry of Economy, Trade and Industry of Japan and
the European Commission Directorate-General for Energy

Final Report

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A. Background

For both Japan and the European Union (EU), ensuring a clean, affordable and reliable energy supply to support the sustainable growth of their respective economies is a central policy goal. And for both, Liquefied Natural Gas (LNG) plays a significant, and likely growing, role in achieving this goal: a fuel globally traded by multiple sellers and buyers, thereby reducing the risk of energy dependence and guaranteeing competitive pricing; a fuel replacing fossil fuels with higher carbon intensity and providing flexible back-up to variable renewable energy production.

In this context, Japan and the EU have signed a Memorandum of Cooperation on promoting and establishing a liquid, flexible and transparent global market for LNG¹. As a consequence, between November 2017 and October 2018 a series of workshops was set up under the Memorandum, involving a broad range of stakeholders to exchange experiences and spread best practices to improve the functioning of the market and its capacity to respond to emergencies. The four workshops dealt with flexibility in contracts for LNG sale and purchase, the organization of gas hubs in consumer markets, price transparency and reporting and how to sustain a robust investment climate.

Workshop participants emphasized that since the beginning of this century, international LNG markets have shown a remarkable development: LNG trade increased from 100 million tonnes in 2000 to almost 300 million tonnes in 2017, with the number of importing countries having quadrupled and the number of exporting countries having almost doubled². Additionally, more recent market conditions appear to lead to increased liquidity and flexibility: with substantial new liquefaction capacity coming on stream in the period up to 2022; with new supply projects allowing for increased destination and volume flexibility; with suppliers being prepared to rely on the depth of their portfolio instead of back-to-

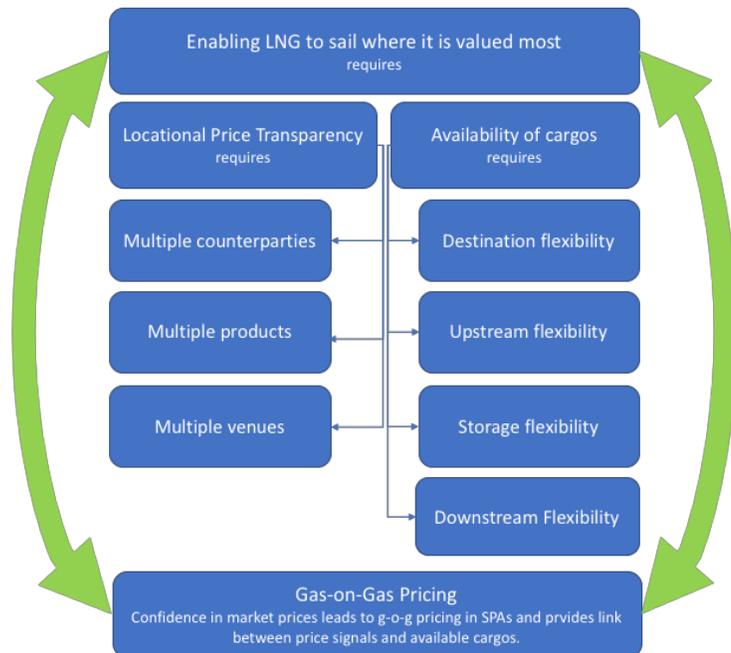
back offtake agreements when deciding on new infrastructure investments, and with historic investments having been amortised and thus more asset owners being ready to price supply and charter on market rates that do not support investment. The emergence of independent traders, the increased use of Master SPAs and the mounting pressure on costs – all this facilitates and re-enforces a trend towards more flexible and shorter-term LNG trading.

On the demand side, legacy LNG destination markets are slowly liberalizing, creating a much more diverse and competitive environment, in which LNG is just one competing energy source. In these increasingly competitive downstream power and gas markets buyers require more flexibility, particularly the option of shorter contractual terms, in order to better manage risk. They seek to allocate risk to different parts of the supply chain, making the traditional LNG supply model – long-term, oil-indexed, take-or-pay contracts with destination restrictions – no longer fit for purpose from a buyer's perspective. In contrast to that, and although there are clear signs of change, securing financing for upstream investments still predominantly requires long-term LNG sales commitments. This mismatch needs to be resolved to enable producers and consumers to equally meet the future market environment with confidence and to allow gas to flow where it is valued most when it is needed most, ensuring both security of supply and demand, and competitive prices to alternative fuels.

¹ <https://ec.europa.eu/energy/en/news/eu-and-japan-boost-cooperation-energy-security>

² See: Shell LNG outlook 2018

In order to ensure that LNG will sail to where it is valued most, the following building blocks need to be put in place:



1. In order for cargos to be sent to where they are valued most (in other words: to allocate the resource 'LNG' efficiently) two things are necessary in the first place: a cargo must be available, i.e. not contractually bound to a specific unloading terminal at a specific time. And a locational price, based on market fundamentals – in essence the supply and demand balance of a certain market – must be visible to attract it.
2. There are numerous ways to increase the short-term availability of a cargo – flexibilities do come in a variety of ways and often manifest themselves in incremental changes: destination flexibility and reloading, cancellation options, different combinations of term types to manage an offtake profile etc. Production facilities, the freight market and the above-mentioned focus on gas portfolios and portfolio optimization instead of LT SPAs all provide flexibility. They all contribute to a growing availability of spot cargos. But in order to unlock this flexibility, market participants need to be able to access and monetize it – the ability to divert cargos, to

reload cargos, to access available terminal capacity short term and ultimately to manage the risk attached to selling cargos into a market, all are essential ingredients of a liquid commodity market.

3. Next to flexibly available volumes, the second dimension are transparent locational or regional prices, based on supply and demand. They exist in North-America (HH), Europe (NBP and TTF), also in Asia (JKM). But unlike North-America and Europe, where downstream gas hubs provide for price-discovery through multiple transactions of significant volumes between a wide range of counterparties, on trading platforms that provide real time information on trade essentials (price, volume, delivery date), Asia relies largely on deemed, not actual prices. Albeit the number of reported spot transactions increase significantly year after year, this factor still limits the robustness of Asian indices: market participants do not fully trust them to reflect the true value of LNG in Asia.
4. To foster the much-needed robustness of an Asian price signal the market's liquidity must increase, which means: more actual transactions need to take place between more trading counterparties. To accelerate the existing trend and to boost liquidity, terminals or downstream hubs need to provide opportunities to trade. At terminals products like reloading, bulk breaking, bunkering and LNG-for-transport have proven to attract counterparties and create price transparency through transactions. And for downstream hub-development the essential building blocks are well-studied and best-practice solutions well tested.
5. Both dimensions of successful market development – 'available LNG' and 'locational price transparency' – are intertwined by the issue of pricing in SPAs: price signals that reflect the supply-demand balance of gas or LNG in a given market necessarily consist of independent gas prices. On the supply side though, oil price indexed LNG prevails for various reasons – particularly the investment risk is easier manageable in the oil-market with its greater liquidity when it comes to derivatives. But to the extent SPAs index the price of LNG to oil prices, gas market

fundamentals will keep having a limited role in the allocation of LNG. This in turn creates the buyer-seller dilemma described above and undermines the potential role of LNG as a secure, competitive fuel stimulating the economy. In a simple example: When in an economic downturn demand for LNG drops, but international policy issues drive oil prices up, the economic stimulus of lower LNG prices due to lower demand will be missing. With the emergence of robust independent Asian gas market prices, based on actual trading, the share of gas-on-gas pricing in LNG SPAs will increase and with it the possibilities to hedge risks through a well-developed gas or LNG derivatives market. This again should foster investors' confidence in the LNG market, leading to mid- and long-term supply security.

The workshops identified best practices and concrete measures to support the development of price signals through facilitating trading opportunities, addressing questions like which incremental changes to the existing contractual framework in LNG trading could foster flexibility, which essential building blocks are required to develop liquid traded spot markets and what role these markets will have for ensuring ongoing investments.

B. Recommended areas for further actions

1. Incremental Changes: optimizing the use of contractual flexibility

In commodity trading standardizing contractual provisions is known to boost liquidity: it helps concluding transactions more readily, on generally accepted or "market" terms, and it eliminates the risks associated with developing and negotiating such provisions anew in each contract. This in turn facilitates the development of more frequent trading in shorter timeframes and hence foster the spot market and contribute to relevant price discovery trading.

In principle every clause in an LNG SPA is open for standardization, and with growing liquidity in shorter term and spot trading the need for greater standardization becomes bigger. However, some of the currently widely used clauses are more likely candidates for standardization than others: technical and operational provisions for example are less contentious and can be more readily standardized than e.g. provisions on destination, resale and profit-sharing. Destination restrictions however have a much bigger impact on market liquidity: Historically many LNG sale and purchase agreements (SPAs), predominantly Delivered Ex-Ship or Delivered at Terminal (DES or DAT) SPAs, included destination clauses that prevented the buyer from diverting a cargo to any destination (or terminal) other than the original contractual destination (or terminal). These destination or diversion clauses essentially reflect the seller's interest to limit the risk of additional costs of transport due to a change of the delivery terminal. But, they also restrict the buyer to engage in locational arbitrage and as such prevented LNG tankers to sail where demand for their cargo was greatest. In a similar way, profit-sharing clauses, enabling the seller to participate on any additional net profit generated by the buyer at a new destination, affect the buyers' incentive to change the agreed unloading terminal of a cargo and hence the market's overall flexibility to react to locational demand and locational price signals. And as "reaction" in this context would mean an actual transaction that - when reported - in turn reinforces said price signals, destination restrictions as such tend to impede the development of transparent prices.

With increasing LNG trade and growing liquidity of international LNG markets such traditional clauses have in many cases been viewed as anticompetitive and have the potential to violate various national or regional antitrust laws: EU competition law investigations focusing on various pipeline and LNG contracts and practices in early and mid-2000's and the more recent antitrust report by the Japan Fair Trade Commission ("JFTC") in 2017 focusing on international LNG trade have reached partially similar conclusions in this respect. At the same time, market practices relating to LNG cargos have moved towards more destination flexibility. This development is

particularly visible in recent US based LNG which does not include destination restrictions.

To support this development and in the interest of an increase in the liquidity of global LNG trade, the workshop series has resulted in a proposal for a model diversion clause, which has been drafted by Prof. Kim Talus of Tulane University in collaboration with a group of international legal experts. The group of experts has drafted this model “diversion” clause with a profit-sharing element in such a way that they consider it compliant with both the antitrust laws of the European Union and Japan³, while providing a balance of the legitimate interests of both parties, sellers and buyers. Its objective was stimulating discussion with experts of other jurisdictions and comments by stakeholders engaged in LNG SPAs. The model clause and an explanatory note is available at: https://www.jurists.co.jp/en/news/181022_2.html

2. Downstream Hub-Development and liberalized end-consumer markets

There are different ways to promote liquidity in commodity trading: the Brent market has evolved essentially as a market initiative without specific regulatory promotion, using voluntary price information by market participants in a certain production area; the N.Y. Gasoline market, another waterborne market that emerged as a global commodity benchmark, but unlike Brent as a center of consumption with supply points globally distributed; and the European Union’s common gas market focusing on liberalizing end-consumer markets with relatively robust regulatory interventions into the market.

In the EU, the last 2 decades have seen the successful development of at least two fully liquid gas hubs – NBP and TTF – and multiple interconnected sub-regional gas markets, with LNG predominantly⁴ supplying the marginal unit

and thereby setting price caps for pipeline gas. When initiating this process through EU legislation in 1998, the central concept of policy makers was to promote supply competition – bringing choice to costumers, as the UK regulator’s claim proudly sounded. Standardised and simple contracts to access a previously unbundled transport infrastructure enabled individual parts of integrated utilities to focus on growing their own respective business area – production, transport, trading, supply – and market participants to separate upstream from downstream operations and risk management, i.e. to disintegrate businesses and start trading with each other on transparent terms. Ultimately trading migrated from physical (terminal) to notional (hub) points and from bilateral to multilateral organised trading venues. Balancing arrangements, that kept the hub “firm” – i.e. eliminated the risk of trades being curtailed retroactively in case of a supply shortage – played a central role in that migration.

For Asia, the workshops noted an explicit political commitment to gas market reforms, including third-party access to infrastructure and (multiple) hub development. In Singapore and Japan, the reform agenda also consists of full retail market liberalization. The tradability of Asian markets in terms of market depth, supply source diversity, and interconnected infrastructure offers in theory comparable starting positions for developing downstream hubs as in the EU – if not for a whole national market, then for sufficiently sized parts of it⁵. However, at the moment most markets still lack actual third-party access to infrastructure, and all lack effective vertical disintegration, i.e. unbundling of infrastructure operations.

The experiences Europe (and partly also the US with Henry Hub) made has spurred a lively academic and business-based debate about the necessary building blocks of successful hub development in downstream markets, which was reflected upon during this workshop series. The following sequence of measures is generally

³ Note: Neither the EU Commission nor METI formally endorses the model clause or its accompanying explanatory memorandum or are in any way bound by it.

⁴ The Iberian Peninsula with Spain and Portugal being a notable exception, where more than half of the domestic consumption is supplied by LNG, leading to trade transactions taking place both at the downstream hub and at LNG terminals.

⁵ In Japan, which does not have a fully interconnected national gas transport system, already the Tokyo bay consumption of natural gas is comparable to that of Belgium.

perceived as vital for a successful hub development in downstream markets⁶:

1. Consultation mechanism to ensure regulatory transparency and balance of interest
2. Entry-Exit system with non-discriminatory Third-Party-Access to unbundled gas infrastructure (pipeline, terminal, storage systems) on standardized provisions and at regulated tariffs for all essential facilities.
3. Centralized and standardized information: fundamental market data and infrastructure availability provided by System Operator
4. Market structural issues resolved: gas release programs, infrastructure capacity release programs, market maker obligations, deregulation of end-consumer prices, etc.
5. 'Paper Trading' - gas can be traded without physical delivery - and standardized trading contract introduced.
6. Reliable Price Index available, used as benchmark in contracts, produced by PRAs and/or Exchange

Within these 6 different actions, the establishment of an entry-exit system at network level is the most important of all building blocks of successful downstream hub development: the lowering of market entry barriers through providing easy access to a market's energy infrastructure for new market entrants, and through providing the information necessary for those new entrants to feel confident about a market, leads to the market diversity and size that is necessary to create sufficient numbers of actual trades and traded quantities – multiple participants and large volumes flowing continuously each day – to be perceived as representative for a market and to be trusted by its participants.

3. Facilitating LNG transactions and price transparency through trading venues

As the workshop discussions identified, fully liberalized end-consumer markets with an appropriate level of supply competition are not necessarily the starting point of successful gas

market reforms. Aiming at price transparency and liquid trading at the wholesale level is a viable option. And particularly in LNG trading there is a range of market infrastructure – terminals, trading venues, price reporting institutions – and a range of already established initiatives that have proven to contribute to market liquidity and price transparency.

The main economic function of a hub is to provide price transparency, with prices being based on market's supply-demand balance, thereby allowing for efficient resource allocation. The workshop series examined the thesis, that a transparent regional price signal in Asia, complementing the European and North-American market prices, could also be created by a seaborne Asian "LNG Hub", rather than relying on traditional domestic, pipeline-based gas hubs to develop in different Asian economies. Similar to the development of the Brent Market in oil, robust prices based on actually traded cargos and reported close to real time by market participants or executed on a multilateral trading platform providing price transparency to its members would be expected to create a regional (wholesale) price signal instead of multiple local ones created by fully liberalized end-consumer markets. Frequently mentioned issues around LNG specifics like gas quality diversions between cargos or difference in sailing distance and transport cost can – as in Brent – easily be normalized and brought to a standard by price assessment methodologies as applied by all major Price Reporting Agencies, e.g. for the most widely used Japan-Korea-Marker (JKM).

And as price indices like the JKM are increasingly used as the basis for physical contracts and to settle futures and derivatives, some workshop participants have argued that a dedicated Asian LNG price might develop organically, similarly to the Brent market. However: as Brent features a pool of concentrated supply that serves as a basis for different regional markets its product is exported to, whereas Asian markets represent a center of global demand within a region, the NY Harbor gasoline market might actually be a better analogy: a consumption center that managed to

⁶ See EFET Gas Hub Development study: <https://efet.org/energy-markets/gas-market/european-gas-hub-study/>

emerge as a global commodity benchmark, with many similarities to Asian LNG:

- One-way commodity flow
- Global center of gravity
- Supply points spread around the world

But whether Brent or rather the NY Harbor Gasoline market serves as reference point to an eventual Asian LNG Hub is of secondary importance as long as the differences to both and the stumbling blocks identified by the workshops on the way to develop such seaborne Asian LNG “hub” are not eliminated. Most notably the lack of flexibility - from alternative supply sources, available and/or accessible LNG terminal capacity, LNG and/or gas storage capacity, fuel switching –, the lack of counterparties and the lack of efficient means to process increasing numbers of spot transactions, which remain bespoke and manual, limit the growth in actual LNG trading. This has one decisive consequence: an insufficient number of trade transactions to perceive price assessments as being sufficiently robust to reflect the “real” price of LNG in the Asian market.

In short, the difference between Brent and today’s Asian LNG market is less a difference between hub pricing⁷ and index pricing, but one between actual and deemed prices constituting these indices.

In this context, the Workshops concluded that increasing the number of potential counterparties is paramount to develop liquidity in the LNG market and thereby creating transparent price signals based on market fundamentals. Three sets of measures promise the biggest impact:

- i. Optimising the use of LNG regasification terminal capacity for flexible and transparent trade, through non-discriminatory third-party access or bilateral capacity arrangements between companies (contributing to flexibility in the market)
- ii. Investing in bulk breaking and small-scale LNG, bunkering, reloading, and LNG-for-Transport services at LNG terminals.
- iii. Exploring the integration of (pipeline-) interconnected terminals to a single virtual terminal, aggregating supply and demand to increase the market size, and enabling the

optimization of available terminal infrastructure.

4. Financing upstream projects in the context of a changing LNG market

One of the key questions that arises with the trend towards increased market liquidity – short term trading between more counterparties allowing for the emergence of locational price signals attracting spot cargos – is whether financing mechanisms for upstream investments need to adapt. Cost mitigation strategies like modular design and FLNG begin to show and might reduce these capital requirements in future projects. However, even then LNG upstream projects will still typically require double digit Billion EUR investments before operation starts and cash begins to flow. When assessing (a) how much, (b) how long and (c) at what price a bank can lend to a specific project, it regularly needs to assess three primary risks associated to each project: the offtake (counterparty) risk, the project sponsor risk and the price risk.

As such, guarantees that a project’s production over the financing period is taken off at a price for which the associated risk can be managed are crucial for financial investors and for banks lending money to the project.

Apart from its risk management role for both parties of a long-term offtake agreement, a project’s off-take contract tenor with one or multiple reputable offtake counterparties is currently still the easiest and most decisive factor for banks when determining the debt capacity of a project: the senior debt amount is calculated based on the committed off-take contracts.

In this logic, any lack of commitment to long term purchase agreements will, at least in the near future, tend to reduce the capacity to acquire debt capital for new LNG investments. And the above-mentioned foreseeable cost reductions would most likely not outweigh such reduced debt capacity.

Shifts in pricing formulas, i.e. from oil-price-indexation towards gas-on-gas, within these offtake contracts seem to be considered less of a

⁷ Hub pricing in this context means prices derived from transparent OTC or exchange based trading.

problem: to the extent there is or will be an increasingly reliable market to sell LNG into, a market creating a “track record” of prices – e.g. downstream gas hubs like TTF or NBP, Brent, JKM, ... –, lenders will be able to base their default risk assessment on past performances in the very same way they assess the project sponsor’s and its offtake counterparties’ credit risk on their respective “track record”.

Beyond the near future though, on a longer-term basis and when a sufficiently liquid and flexible market is established, a project’s proven ability to sustainably market uncontracted volumes and/or replace shorter-term purchase agreements with successive, also shorter-term agreements, will again create the “track record” required for lenders to trust in a project’s ability to generate a stable cash-flow by selling volumes over a sufficiently long period of time to a string of successive, reliable counterparties, thereby relaxing their strict requirements of guaranteed offtake through long-term contracts.

A challenge for new projects to attract enough debt capital might occur though in the transitional phase, when the nature and characteristics of a project’s possible income guarantees are shifting in the context of growing market liquidity, flexibility and transparency, entailing trends towards shorter offtake contract durations and new pricing formula’s in offtake agreements. In this transitional phase, buyers are reluctant to cover their supply needs fully through offtake agreements as they want to take advantage of flexibilities offered by emerging shorter-term trade and spot markets, while project financiers are still to be convinced about the solidity of this shorter-term and spot trade that have not yet a proven ‘track record’.

How to avoid a complete absence of investment decisions during this transitional phase? The workshop participants expect financing here to shift towards new actors and new structures. Investors like equity funds and institutional investors, who have experience in taking merchant risk, will potentially step in and cover the gap of uncontracted cash-flow banks are not (yet) ready to base their lending decision on. Additionally, there is evidence for an emerging trend of project’s being developed on the back of the sponsors’ own gas trading portfolio and access

to relatively cheap corporate financing, without signing long-term offtake agreements prior to taking the investment decision. Also, end users and traders take an equity share in projects, assuming some of the risks associated with uncontracted volumes. Uncontracted volumes under these schemes are then much more likely to come to the spot market, contributing to its liquidity.

However, this transitional phase might also see a potential development to a two-tier market of flexible and less-flexible supply sources, putting additional pressure on the latter to secure sufficient guaranteed offtake and hence financing. Eventually, this transitional phase could lead to an unhealthy concentration on the supply side as big players can finance new projects on the basis of equity/balance sheet.

The workshops concluded that it is too early to say whether the relatively small number of FIDs taken in 2016 and 2017 is a reaction to the identified structural changes in the LNG market or rather proof of the cyclical nature of investment in commodity markets. Recent market analysis indicates that the year 2018 has already seen a huge increase in the scale of new upstream project investments and that 2019 might even be a major one in terms of FIDs as projects in Russia, Qatar, Mozambique as well as the United States get sanctioned. Overall it is not clear how quickly buyers will prevail and offtake contract tenors will actually reduce in a scale that affects the financing capacity for new upstream projects. However, even if this would be the case the workshops concluded that negative implications can be expected to be rather transitory.

In order to get through this transitional phase without too strong price fluctuations or supply constraints, two issues should be crucially addressed by sector stakeholders, also in discussion with the financial sector:

- The need for sustained and coordinated efforts to further develop and well establish liquid short term and spot trade, and related robust price indexes
- The need for coordinated efforts to ensure upstream project financing in the transitional phase towards a well-established liquid, flexible and transparent market, including the exploration of new

schemes of financing using different sources of financing

C. Summary and way forward

Discussing ways of “promoting and establishing a liquid, flexible and transparent global liquefied natural gas market” was title and ambition of this workshop series. The knowledge and expertise of the participants of all 4 workshops have helped to understand that current trends in LNG trading already lead the market in the right, aspired direction. To underpin this development, actions that can be recommended in the frame of a continued EU – Japan cooperation on the global LNG market following the workshops, include:

- test the model clause on destination flexibility and cargo diversion with legal experts from other jurisdictions;
- facilitate market actors to take up model provisions on destination flexibility;
- expand existing flexibilities in the current LNG market environment (regarding terminals and trading venues) in emerging consuming and producing countries;
- facilitate discussion among stakeholders to increase understanding about possibilities and measures that can enhance LNG trade before or in the terminal, such as cargo-partialisation, use of LNG as fuel for maritime and road transport, regulation for access to LNG terminals, as well as the price discovery potential of such trade
- promote that gas consuming countries consider benefits and opportunities of, challenges and barriers to full downstream market liberalization;
- increase the understanding of best practices of developing downstream hubs in interested consuming countries, based on lessons learned in the development process of effective existing hubs;
- encourage counterparties of LNG trades to participate in LNG trading platforms that

provide price transparency and facilitate discussion on how LNG trading platforms can further enhance in practice the establishment of liquid, flexible and transparent spot trade, including through their use of standardized contract terms and conditions;

- transfer knowledge regarding wholesale level price discovery trading to interested LNG consuming countries;
- facilitate the exploration of integrated regional 'virtual' terminals;
- exchange views on and discuss the implications of legislation requiring the publication of market price relevant information
- further facilitate the discussion on efficient risk allocation among different players in LNG investment to increase the security of supply of LNG globally, regionally and domestically.
- facilitate dialogue between LNG sector stakeholders and the financial sector to discuss possible new trends in financing upstream projects in view of ensuring investment decisions in the transitional phase towards a well-established liquid, flexible and transparent market.
- Facilitate a discussion with all relevant stakeholders on the possible criticality of LNG shipping for well-functioning liquid and flexible LNG trade