

PORTUGUESE GOVERNMENT CONTRIBUTIONS

Consultation on the EU Strategy for liquefied natural gas and gas storage

General Remarks

First of all we would like to express our support and agreement on the European Commission initiative for the definition of a Strategy for LNG and Storage for EU. We believe that this initiative can be an important step to establish measures and guidelines for the development of LNG market, LNG technologies and gas storage, in articulation with respective regulatory framework, in Europe, for the purpose of internal gas market and security of supply.

Portugal supports initiatives which promote the enforcement of European internal gas market in order to contribute to the developing of gas infrastructures, interconnections and reduce the level of isolation of some regions, like Iberian Peninsula. Portugal also strongly supports the development of interconnections and gas infrastructures, since they contribute to the reinforcement of the security of energy supply and to the promotion of competition and sustainability of energy systems.

As already known, in the natural gas sector the Iberian Peninsula assumes itself as having one of the most important and high potential to increase Europe's import capacity and diversification of natural gas, having all the conditions to be one of the main LNG entry gateways to Europe.

Portugal also strongly supports the cooperation mechanisms inside and outside Europe. In the cooperation between European and non-European countries can be highlighted initiatives like Union for Mediterranean (UfM) and TTIP agreements (Transatlantic Trade and Investment Partnership).

It is important to note that an integrated view of the role of natural gas infrastructures is essential to assure that the characteristics and potential benefits from each of its components are fully considered and taken into account to build a robust, competitive and reliable gas market.

Responses to Commission Questionnaire

LNG in the EU today

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 neighboring 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

Yes, we agree with the regions identified above. The regions selection should take into consideration not only the most vulnerable countries to LNG supply, but also the countries with higher potential to be an effective entry for gas in Europe (by pipeline or LNG terminals). Portugal and Spain (Iberia Peninsula) are an example of a country/region with high potential to receive LNG. In Portugal, LNG terminal in Sines is located in one of the higher deep water ports in Europe, corresponding to one of the entry points for LNG in Europe with higher potential.

The share of LNG can be quite different from country to country and between different regions in the EU. In the past recent years, LNG has proved to be one of the most effective way to improve diversification and security of supply in the short and long term. Portugal, and Spain, are a good

example of the importance and contribution of LNG to enhance a supply source diversification and the security of supply associated to this diversification.

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?

Portugal doesn't have any cost-benefit assessments for LNG infrastructures, only for the development of interconnection projects. A cost-benefit assessment was made for 3rd interconnection PT-SP project, and considered the methodology and procedures defined by ENTSO-G, and recommended by EC for PCI financing purpose. For the purpose of this question we think that ENTSO methodology for cost-benefit assessments can be considered as a reference.

The main reason to favor new LNG projects is the significant difference in the European capacity to receive natural gas by pipeline and by LNG terminal (referred in point 1.1 of consultation paper). However, is clear that an increase of LNG terminals or the upgrade of existing terminals is insufficient without a correspondent improvement of the pipeline network to connect the LNG terminals. The same rationale is applicable to the regasification/compression system to make as available in gas network.

Capacity of the LNG terminals already existing in the Iberian Peninsula should be taken into consideration in the definition of the EU goals. New LNG terminals should only be considered when and where they are really needed in order to avoid an economic burden for the EU consumers associated to low use rates of these infrastructures. On the contrary, new interconnections would provide an improved gas routing alternative to serve the market.

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

Current regulations in force cover the European and EU Region's needs. After the adoption of EU strategy for LNG and storage, that should be reflected in TEN-E regulation, promoting the respective articulation.

The development of some infrastructures can improve the potential of existing LNG infrastructures. See the example of Sines LNG terminal in Portugal that is one of biggest deep water port in Europe, and has great potential to receive more vessels and became one of the main entries of LNG in Europe, but without a well dimensioned pipeline network, this potential can't be effective. The 3rd interconnection PT-SP is a project that will develop the gas export capacity of Portugal, and will contribute to transport the (re)gasified LNG, through Spain, to the rest of Europe. The same happens at a regional vision for Iberian Peninsula, or in Spain for the LNG terminal and Iberian/Spanish regasification capacity that depends, beyond internal demand, on the capacity to transport the gas to France (and rest of Europe), and this is the reason to be so important the development of MIDCAT project (in Pyrenees) to overcome one of the recognized bottlenecks in European gas internal market.

The establishment of more specific methodologies and criteria addressing the diversification of sources and routes and also security of supply could facilitate the EU market construction. For this,

priority should be given to a better network cooperation of TSOs, either for the systems operation in emergency conditions but also for the infrastructures development with interconnectors to better link the different countries and regions in Europe. The existing TEN-E Regulation can play a major role to accomplish the EU gas market integration goals.

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?*

The increase in RES, the improvement in energy efficiency, the LNG global price differences (namely the differences that came out from the Fukushima accident in Japan), and competitiveness of coal over gas were the main reasons for the low use of LNG in Europe in the latest years.

The future increase of RES share in total electricity production has intermittency issues that need to be supported by fossil fuel backup capacity. Natural gas has clearly demonstrated its advantages over other fossil fuel alternatives, whether in technical or in environmental perspectives.

The risk of stranded assets and lock-in effects can be addressed giving priority to investments that increase the use of the already existing LNG terminals in Europe, whether through new interconnection pipelines or increase in the capacity of already existing ones (e.g. compressor stations).

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)?*

Portugal doesn't have any assess about the most cost-efficient balance between technologies for greenhouse gas emissions reduction, reduction of dependency on imported fossil fuels and the implementation of LNG technologies.

In the case of Portugal the existing gas infrastructures, namely the LNG terminal, have a strong potential in terms of security of supply not only at national level but also at regional and European level that cannot be disregarded in the future equation.

Potential entry barriers for LNG

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.*

In the Portuguese case there are still few market players in the gas sector although the situation has been improving in the recent years and is expected to benefit from the full implementation of the third energy package and the development of the Iberian Gas Market (MIBGAS). In what concerns the LNG Terminal, the situation has been gradually changing, since at present the country already receives LNG from multiple sources and the terminal has been used in unloading and reloading operations as well. Nonetheless, in order to improve and speed the process it is essential that the MIBGAS is fully deployed and that there is an increase in competition, for which the third interconnection pipeline between Portugal and Spain has an important role to play. Last but not least, the anticipated increase in the interconnection capacity between the Iberian Peninsula and the countries beyond the Pyrenees (MidCat project) will enable an additional role of the LNG terminal as an effective entry point to Europe (seen as an Energy Union), which will favour its use by additional players.

We think that there is a need to improve the flexibility of regulatory framework and promote agreements between European and non-European countries to increase the LNG availability in Europe. We would like to highlight that Portugal, with a deep water port in the Atlantic basin could become the gate way of the LNG coming from the US to Europe.

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?

Territorial constraints are associated to bottlenecks that can contribute to the isolation of some regions or difficult the flow of natural gas from regions with great potential to receive LNG in terminals. From a regional point of view, the lack of interconnection infrastructures between Portugal and Spain and between Spain and France through the Pyrenees can be identified as territorial barriers to the optimal use and access to LNG terminals in the Iberian Peninsula, and thus to LNG, from the central European countries.

There are other difficulties, for example, associated to regions/countries that are sources of LNG and have a low political stability or military conflicts. Can be also improved the relational between TSO at cross-border connection, promoting the cooperation at technical and commercial level.

Another possibility to overcome commercial barriers can be the promotion of regional internal market that can be the basis and facilitate the concretization of a European internal market. Between Portugal and Spain is in progress the development of the Iberian Gas Market (MIBGAS, as already occurred for electricity – Iberian Electricity Market - MIBEL), example that can be followed by other countries/regions.

Financial barriers are associated to the high investment level for LNG infrastructures and one possibility to overcome this difficulty can be the development of initiatives to provide financial assistance for the key infrastructures identified for European internal market purpose.

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?

As already mentioned, we think that existing legislation and legislation revision processes are trying to respond to the new challenges, promoting an integrated vision of European market, regional

approaches and highlighting the importance of cooperation mechanisms, for European internal market purpose. But there is still margin to improve: EU policy initiatives and/or existing legislation should develop towards an increase in the harmonization of regulated activities, leading the path through the definition of principles, criteria and methodologies, rather than the indication of specific targets, but giving more space and opportunities to gas market activities and cross border gas movement. The main challenge for EU is to ensure the uniform application of legislation through Europe, monitoring and checking the respective compliance.

Special attention must be paid to regional and country specificities and also market maturity in order to avoid forcing measures that would burden the final gas consumers.

International LNG markets

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 evolution of the worldwide LNG markets can be beneficial to European internal market because will entail, consequently, an increase in LNG sources diversification. To ensure this diversification regulation has to be developed to facilitate the commercial trade and agreements between European and non-European countries.

This diversification can promote more competitiveness and consequently achieve better price for gas traders and for the consumers. That cannot imply the shift away of all-indexed contracts, but can be an opportunity to negotiate existing contracts or set new contracts (no indexed contracts).

Taking into account the expected growth of size and liquidity of LNG global supply market in the next decades, LNG will have a major role in the EU natural gas market. For this role technology and environmental aspects that favor natural over other fossil fuel alternatives, namely coal, will be determinant.

See also question 4 and 7.

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?

Taking into account the expected growth on the size and liquidity of LNG global supply market, including the increase of spot and short-term contracts in the next decade, and the convergence in LNG trade prices at global level that is already occurring, we do not see any specific problem in the functioning of the international LNG market under normal conditions. Nevertheless, special attention should be paid by Member-states that have a strong dependence on LNG, like Portugal. In times of stress, in spite of functioning the international LNG market could determine such an increase in the LNG spot prices that it would economically limit its use in some activity sectors, with the corresponding impact in the economy of these countries.

To be more attractive to international market Europe has to show that is prepared to receive and transport natural gas across EU. For that the first step is to develop the infrastructures to receive LNG

(LNG terminals) and improve the regasification capacity and develop interconnections between countries, with special attention to overcome barriers, like bottlenecks, ensuring the transport of natural gas among regions.

LNG technology issues including LNG use in transport

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?

We don't have any assessment for a medium term technological developments for LNG in transport sector but, in general terms, there are no significant barriers for the LNG use in the transport sector.

For that it is important to promote the use of LNG in the transport sector by European Commission, introducing incentives and financial support for technology research and development (technology for vehicles, pumping stations, ...) and a regulatory framework that enables these initiatives and LNG adoption in transport sector, where can be defined targets to adopt LNG technologies/consumptions (share/mix with LPG and natural gas).

We believe that the EU strategy for LNG and Storage can be an important step for the development of LNG in the transport sector. In the case of Portugal it is expected that LNG as a fuel for maritime transport gains strong importance in the coming years given the country's strategic location in the Atlantic basin and corridor. It is essential that this potential is realized according to a coherent approach to LNG demand and supply logistic chain in order to be able to set a reliable deployment of LNG infrastructure and innovative roll out. For this reason Portugal, through REN, is part of a consortium that has recently applied a project in this field to EU funding (through CEF – Transport), designated as CORE LNGas hive – Core Network Corridors and Liquefied Natural Gas, with a view to supporting the deployment of LNG infrastructures for maritime transport and ports operations along the Spanish and Portuguese sections of the Atlantic and Mediterranean Core Network Corridors.

Additionally, there is also a strong potential for LNG as fuel for road transportation as well, bearing in mind initiatives such as the Blue Corridor, although CNG (Compressed Natural Gas) solutions must also be pursued taking advantage of the existing distribution networks.

LNG sustainability issues

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.

Portugal doesn't have any assessment for environmental impacts/sustainability associated to the processing of LNG, but some evidences can be discussed.

There are reasons to believe that the current global mobilization and awareness towards the need to address climate change challenges effectively and the resulting urgent climatic action requirements, led primarily by the EU, USA, and more recently by China, will ultimately favour the utilization of

natural gas in general and LNG in particular in the medium and long term, given the fact that natural gas is the less pollutant of all fossil fuels.

Storage

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?

The development of natural gas sources, liquefied or not, entails the network operators and storage operators to be successively more flexible, in order to receive, manage and make gas available to meet the demand. It is important to ensure the availability of gas for any situations and maintain appropriate gas stocks (normal conditions, stress and emergency).

The increase of gas sources, mainly for LNG, implies more variability in gas chemical and physical characteristics, which influences the management of gas stocks (e.g. in extraction and injection at underground gas storage).

The diversification of LNG sources and the development of the internal gas market in Europe can have the consequence of increasing storage capacity in the countries that will be the entries of LNG in Europe (mainly the storage at LNG terminals) and should have a great flexibility level to accommodate the discharges of different types of vessels. The major role that natural gas will play in the fossil fuels energy mix in Europe will certainly open some opportunities for gas storage

The forecasted increase of the LNG share in the EU supply mix in the long term can also give some additional opportunities do UGS facilities, again as a flexibility mechanism, as they can compensate and smooth the ship's unloading batch process. This can be quite relevant in Member States with high LNG share, like Portugal and Spain, and in systems with a single LNG terminal like Portugal or Greece.

Underground storages (UGS) are also the main tool to accommodate seasonal effects of gas supply and consumption allowing a significant reduction of the global investments in both network and upstream infrastructures in particular when combining also a debottlenecking effect to the gas network and as a flexibility source for the market.

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)?

Existing legislation and regulation seems adequate to ensure that storages can fully play their role in addressing supply disruptions or other unforeseen events.

We have to highlight the revision process of Regulation 994/2010, where is clear the effort of EC in trying to define in Europe a regional approach and the development of cooperation mechanisms for security of supply for gas sector. Scarcity and market imperfections may generate unbearable and prolonged price pressure to gas supplies. Gas is sourced from relatively few areas in the world, and a major disruption at the source or affecting critical infrastructures in the value chain may hinder severely and for extended periods of time the gas flows and therefore market prices. Storage as close as possible to consumption is a fair answer to the problem. UGS (Underground Gas Storages) could play as a flexibility tool; in this respect market and regulatory conditions shall ensure a level playing field between storage and other available flexibility products that don't face the same regulatory constraints (e.g. TPA)

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

First of all, the revision of Regulation 994/2010 could help to clarify/define the possibility to market based instruments that ensure adequate minimum reserves - these instruments could be considered in the preparation of the Emergency Plans and Preventive Action Plan of each country (it will be important an uniform adoption/application in Europe).

Each Member-state should decide which instruments are the most appropriate to ensure its security of supply and risk management. One specific measure that can be implemented to guarantee that the undertakings will meet the obligation of gas supply is ensuring that gas will be physically available to supply protected customers in case of a critical situation. A market solution is only a first step and reserves should be available as a last resort solution.

It may be possible to have minimum reserves if the gas network has a high level of flexibility and mechanisms well defined to respond. For example, in Portugal to provide this flexibility, for emergencies planning are defined measures like:

- The use of management systems to provide operational flexibility in gas transport network and infrastructures (LNG terminals, Underground Gas Storage, LNG storage, compression stations and injection/extraction units). It is also important the imports flexibility ensured by contract margins and additional gas planning, which have to be considered in reserves dimensions and definition of reserves level. This flexibility is controlled by monitoring systems at dispatching level;
- Resort to the OBA (Operational Balancing Agreement) with the interconnected TSO from Spain (Enagás) according to the agreed technical system management tools;
- Resort to the TSOs cooperation measures foreseen under the existing "Mutual Assistance Agreement between Spanish TSO (Enagás) and the Portuguese TSO (in accordance to Regulation 994/2010);
- Priorities and levels of commercial utilization of the stored gas in UGS and LNG Terminal Storage by shippers;

Storage Infrastructure

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?

Portugal doesn't have sufficient data to determine what the optimal level of storage in a Member State or region would be. But it is clear the importance to have different types of storage, UGS or LNG tanks in terminals or ports. In the case of Portugal the existing gas infrastructures, namely the Carriço UGS and the Sines LNG terminal, have a strong potential in terms of security of supply not only at national level but also at a regional level. The Sines LNG in terminal give us an extra level of flexibility to the natural gas system associated to diversification of supply of natural gas imports. For the specific case of Portugal, the structure of the gas supply and demand chains and the characteristics of the gas system, with only one LNG terminal, one UGS facility and one neighboring country, and the flexibility required by the network to operate, are much more important than the ability to cover seasonal behavior of the demand, for example.

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

Portugal believes that current regulations in force cover the European wide and EU Region's needs. As for the TEN-E Regulation's application, priority should be given to the infrastructures development with interconnectors to better link the different countries and regions in Europe taking advantage of the already existing UGS sites. After the adoption of EU strategy for LNG and storage, that should be reflected in TEN-E regulation, promoting the respective articulation.

Nevertheless, some improve could be done for existing Regulations to facilitate the leading role of the EC in the development of the EU natural gas market. The identification and definition of more specific methodologies and criteria for the diversification of sources and security of supply could also be done.

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 and weigh those against risks to gas security and resilience? What options exist in your view to reduce the risk of stranded assets?

In order to avoid the risk of stranded assets and lock-in effects priority should be given to investments that increase the use of the already existing UGS sites in Europe, whether through new interconnection pipelines or increase in the capacity of already existing ones (e.g. compressor stations). We recognize that the uncertainty over future gas demand can also imply some uncertainty in gas market investments. Some delay in investments could lead to a downgrade of gas market and infrastructures and increase the risk level in security of supply.

Regulatory framework and potential barriers for storage

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

For a regional approach it is important to have a uniform and homogenous regulatory and legal framework. The current Regulation 994/2010 (and the revision process) already set a sufficient legal framework for storage management at emergency situations for security of supply purpose.

TPA tariffs to transport the gas through more than one network in a region is necessarily a barrier to the optimal use of storage in a regional setting, as this represents an additional cost for the gas to be stored.

There is some necessity to align procedures between member states at regional level, in terms of licensing this kind of infrastructures.

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?

In sequence of already said, we think that existing legislation and ongoing initiatives (like legislation revision processes) can tackle the remaining issues and are trying to respond to the new challenges, promoting an integrated vision of European market, with a regional approaches and highlighting the

importance of cooperation mechanisms. Although the ongoing EU policy initiatives and/or existing legislation can adequately tackle the outstanding issues and pursue the EU goals, there is margin to improve. Over regulation and legislation ends-up could restrict the natural functioning of the market.

See also Question 8 (associated to LNG)

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?

The question of the need for rules to define specific tariff regimes for storage will depend on the level of integration of the EU networks and gas market that will be achieved along the years to come. We think that can be defined the procedure and methodology at EU level for storage tariffs, but the tariffs should be set by competent authorities, at national level, according to the available measures in order to ensure the security of supply and also technical and economic reality of each member state.

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.

For Portugal, there is no record of difficulties in accessing storage facilities.

These situations of potential difficulties in accessing storage facilities are considered and have specific procedures to address these situations, in the risks analysis and prevention action/emergency planning.

For example, in risk analysis there is defined a low probability for occurrences associated to the unavailability of security/strategic reserves in UGS and for unavailability of “commercial gas” due to non-flow/moving by shippers.

Nevertheless we acknowledge the following barriers to competition:

- Storage tariff: It would be desirable for users to be able to distinguish the different components of the storage services (capacity, injection, withdrawal); also distinction between storage and transmission fees and cost reflectiveness;
- Low transparency in access condition may result in a barrier for new entrants;
- the lack of transparency about access conditions may strengthen dominant positions and hampers market development;
- The complexity of legal frameworks and agreements may act as barriers.

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.

In Portugal difficulties related to feeding LNG gas from the storage site back into the gas network have not been reported.

Situations of potential failure in feeding from LNG storage are considered and have specific procedures to address these situations, in the risks analysis and prevention action/emergency planning.