



GIE Position Paper

Fit for purpose storage market for a sustainable energy future

About GIE

Gas Infrastructure Europe (GIE) is an association representing the interests of European gas infrastructure operators active in gas transmission, storage and LNG regasification. GIE is a trusted partner of European institutions, regulatory bodies and industry stakeholders. It is based in Brussels, the heart of European policymaking. GIE currently represents 70-member companies from 26 countries. Its internal structure has three columns corresponding to the three types of infrastructure activities represented: GTE (Gas Transmission Europe), GSE (Gas Storage Europe) and GLE (Gas LNG Europe), all of which fall under the umbrella of GIE. This structure allows member companies to speak with one voice on infrastructure topics as well as to build positions on column specific issues. To find out more about GIE's structure and activities, please visit our website at www.gie.eu.

Note to Editors

Gas infrastructure as a whole provides the flexibility that the current and future energy system requires. This position paper focuses specifically on the increasing role of gas storage and the policy asks. The analysis on other flexibility providers in the development of a cross-sectoral flexibility market will be carried out in the next position papers.

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Introduction

In 2009, the EU made a huge step towards the liberalization of electricity and gas market. Since then the markets have developed substantially and brought benefits to society. Increasingly, developments have separated physical world from virtualized world as markets became more liquid, something that is essential for proper functioning of energy markets.

Now the physical world is catching up on Storage System Operators (SSOs), who are put under challenging conditions with low seasonal spread price. The gas market model needs to be adjusted to ensure that the EU can provide a regulatory framework that is sustainable and consistent with EU's long-term goals.

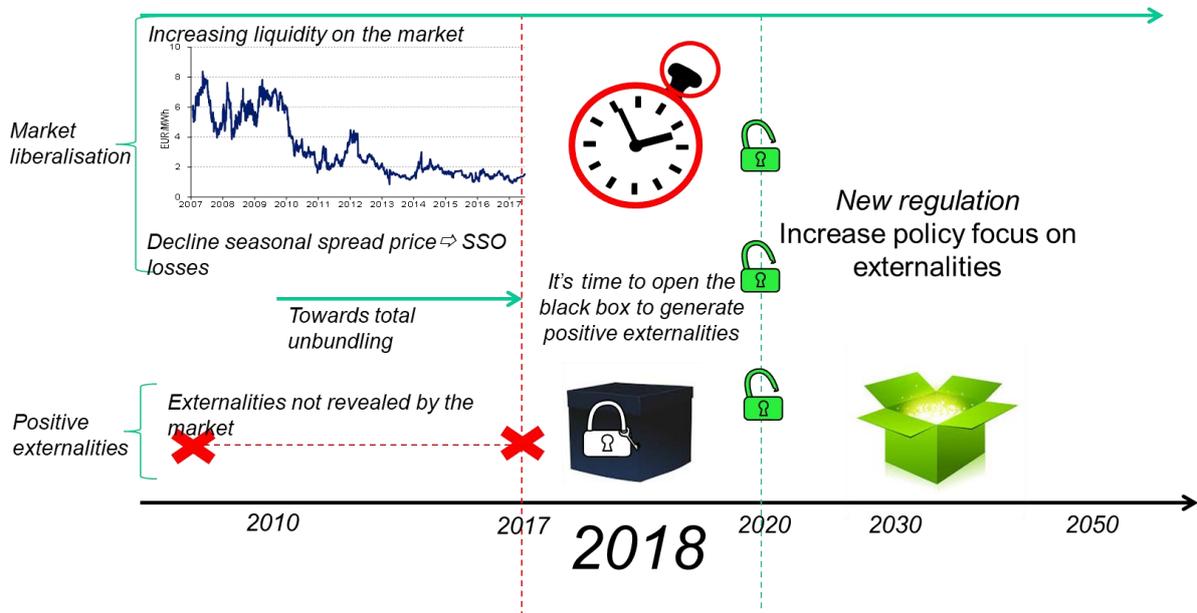
GIE attaches particular importance to ensuring that positive externalities¹ are well-addressed by the future regulatory framework, in order to implement the optimal market design and encourage the right behavior on the part of market participants. This would enable SSOs to be appropriately rewarded and able to continue delivering positive externalities in the future, whilst ensuring an optimum balance in the energy system in terms of overall ecological, economic and social impact.

Allowing for such positive externalities in the regulatory framework would also mean that there would be positive shift in focusing away from a system accustomed to operating within vertical silos towards a horizontal approach, where the integrated energy system is considered as a whole.

Achieving full decarbonization of the energy system requires the adoption of a comprehensive approach to ensure those (SSOs) who participate positively in the social benefit are remunerated accordingly. This will encourage SSOs to continue delivering these services in the future.

¹ A positive externality exists when a company making a decision does not receive the full benefit of the decision. The benefit to the company is less than the benefit to society. With positive externalities, less is produced and consumed than the socially optimal level.

- *Setting the scene (of the future society we should be heading towards, if we wish to comply with a green world) - from black to green box*



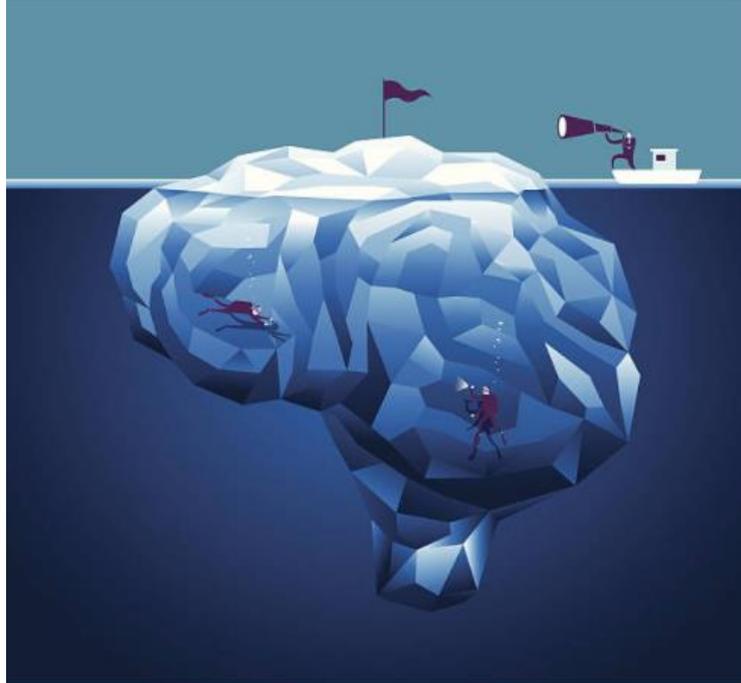
- *Up to now SSOs have been providing insurance and system services that have not been revealed by the market*

Insurance services allow the storage of gas locally, close to centers of consumption, and provide resilience to the energy system, especially in times of gas shortage or outage. System services enable the energy system as a whole to benefit from economies of scale in such a way that the network can be expanded at the lowest cost.

These hidden services have not been remunerated in any way. Prior 2010, it was not an issue as SSOs were making profits by selling seasonal modulation and a black box of the hidden services was taken for granted.

Now that the seasonal spread price is low, GIE has had to open the black box and analyse the current market model for SSOs. With the [Pöyry study in 2017](#), GIE investigated these hidden services. In 2018, following the guidance of the European Commission and a number of analysis showing a vision of an integrated energy market, GIE launched the next study with [FTI-CL Energy](#) to go a step further by finding adjustments to the market model that would enable SSOs to be engaged in a dynamic process of green sustainable development.

- *Turning the black box into a green box*



In the long-term, the system value will increase as storage facilities will provide system services to the whole integrated energy market including the electricity one. The recognition of system value is important for a helicopter view on the whole energy infrastructure that will put aside working in silos and allow for finding an optimum solution for the whole system.

The role of gas storage will be extended from providing a back-up service for electricity generation today to becoming a driving force of a renewable energy system of tomorrow thanks to their capabilities to balance the energy system at a large scale and at different time frames, by incorporating from the outset renewable and low-carbon gases.

This will be consistent with a fundamental change of a supply side of energy. As storage will provide the ability to store 100% renewable energy, it will even enhance the uptake of renewables into the integrated energy system, thereby giving the decarbonized gas market a sustainable future that goes even beyond 2030 and further.

The presence of gas storage will enable the storage of renewable and low-carbon gases which will in return result in a stronger supply of these gases, while at the same time increasing the ability to store intermittent and variable RES. This will provide a higher level of clean, renewable energy without extensive networks for the benefit of all stakeholders.

The main advantage of storing methane and hydrogen (renewable energy in gaseous form) is its unlimited usability in the gas infrastructure, which will serve as a basis of a virtuous circle. This will lead to higher growth of renewable energy in the energy network without extra cost for the system, thus enabling more social cohesion and better environmental protection. As for the insurance value, gas storage will continue to play an important role in providing resilience of the energy system.

Finding a suitable regulatory framework is key to unlock the full potential of gas storage and overachieve the EU decarbonization targets.

1. *Increasing role of storage in supporting EU decarbonization long term goals*

The key role of storage may gain momentum as we move towards a full decarbonized market. This can be explained by the fact that gas storage enables to benefit from economies of scale (from a focus on storage combined with gas grid to the integrated energy grid system as a whole) and from economies of scope (from a focus on electricity to encompass transport, industry, and heating).

Gas storage can thus be considered not only as an enabler, but also a driving force of the green transformation towards a fully decarbonized market



- *Before 2030*

Storage could be considered as an enabler/facilitator to smooth out the transition and enabling the system to get greener in a smooth way, knowing that Member States will start from different base in their energy-mix:

- ✓ *Fostering the transition towards greener gas mix, enabling countries to start from different low base in energy-mix*
- ✓ *Resulting in a stronger supply of renewable and low-carbon gases while also satisfying an increasing requirement for storage of intermittent and variable RES*
- ✓ *Developing technology in electrolysis, fuel cells, the hydrogen grid infrastructure, and CCS could be shared across end-use sectors*



- *Beyond 2030 and up to 2050 and even beyond*

Gas storage can be a driving force behind the development of the energy network by continuously delivering on time the right level of renewable energy.

- ✓ *Fostering the achievement of this virtuous circle where storage, by storing renewable gases would change the fundamentals of the supply side, enhancing its uptake that would definitely help to over-achieve the long-term targets of the EC.*

2. *The storage is valuable for the energy system as a whole*

An energy system with higher shares of renewables requires a sufficient storage and balancing capabilities. As long as there are no alternative solutions to gas storage for this kind of valuable service, SSOs need to be remunerated accordingly to ensure that they will continue delivering this service in the future.

Beyond the political recognition for these positive externalities in the energy system, there is an urgent need to react as SSOs are now put under challenging conditions.

Without any proper assessment of the needed storage capacity and an adjustment of the regulatory framework, there is a risk that too many storages may close or close in the wrong location, putting at risk the resilience of the energy system as a whole. The overall objective is to provide the best possible service to the citizen in a cost-efficient manner, in a digital and green world where the assimilation activity around renewable energy is guaranteed.

3. *An evolving regulatory framework fostering the integration of gas storage in a decarbonized market*

- *First step: lay the cards on the table*

Generating adequate price signals is becoming more and more challenging in the energy transition. Like in the electricity sector, some adjustments would definitely help to better understand and manage these invisible services to the point of making them visible and tangible.

This is the first step in the process since up to now, generating externalities was not even discussed and market participants were used to working in silos. Now that some externalities need to be considered in order to achieve this long-term future, this kind of consideration is part of the holistic approach to a green box.

Internalizing positive externalities means that not only SSOs would continue delivering these services that would enable the energy system to keep functioning but would also be part of a green future where renewables could start blooming at an unprecedented scale in the market.

▪ *Second step: chart different pathways in the future*

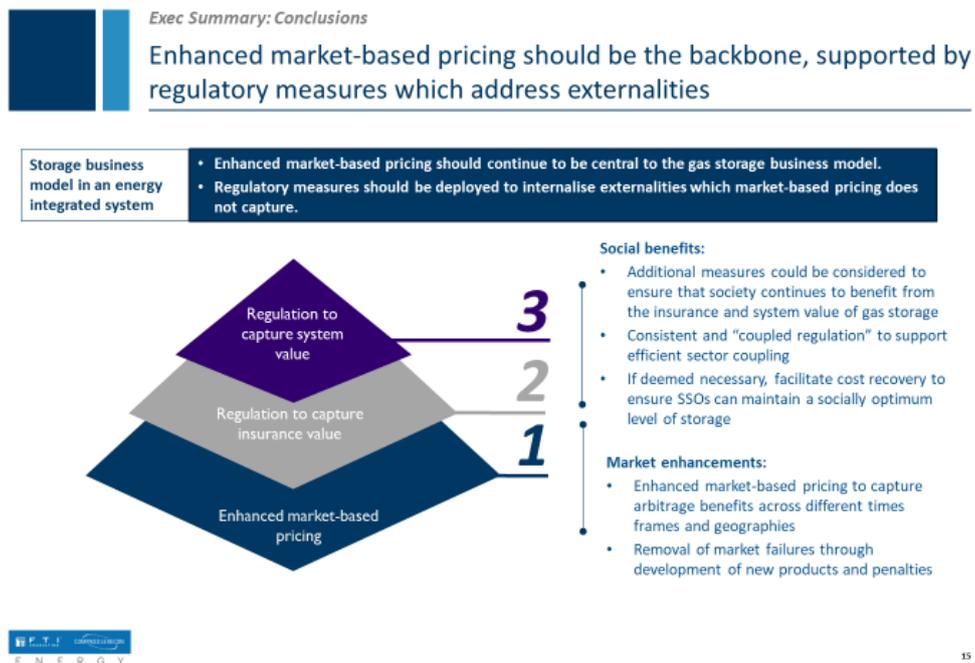
Unlocking the full potential of gas storage in a digital world means that a comprehensive approach of the energy network, in the modelling part, would enable to assess the social benefit of such hybrid system where a greener mix could be the starting point of each country.

In other words, setting a price on externalities would enable SSOs to be remunerated for delivering their services, but would also give the opportunities to users to better capture these values as SSO would continue delivering these services in the future. Market integration would be optimized.

Conclusion

The relevance of the FTI-CL Energy study on the measures for a sustainable gas storage market focuses on bridging the EC’s market-based approach to its long-term vision and calls for a revisit to the regulatory framework.

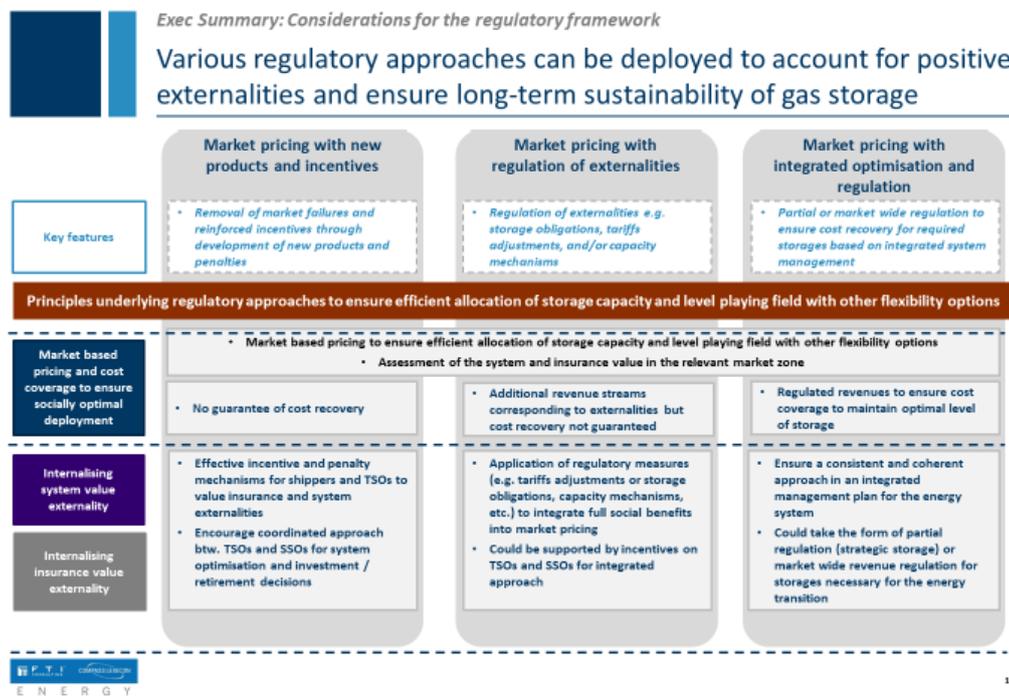
As its foundation, the study promotes a market-based approach by suggesting that Storage System Operators (SSOs) move to market-based pricing, provided that a basket of additional measures is considered for internalizing externalities generated by SSOs that, by definition, cannot be captured by the market.



Source: FTI-CL Energy study

With regards to a set of measures, three major options are recommended to account for positive externalities and ensure long term sustainability of gas storage market:

- *Setting a price on externalities via market-based measures while reinforcing the active role of TSO in an integrated gas/electricity system*
- *Implementing regulation on externalities to ensure additional revenue streams to SSOs while supporting the active role of TSO and SSOs for an integrated approach*
- *Partial or market wide regulation to ensure SSOs cost recovery for required storages based on integrated system management*



Source: FTI-CL Energy study

GIE Recommendations

- *Wherever the current framework does not already recognize/reward the full value of the underground gas storages, GIE supports an evolving EU regulatory framework that enables to move to market-based pricing, in order to achieve efficient gas storage use in a level playing field.*
 - ✓ *This move towards market-based pricing was part of European Commission request.*
 - ✓ *This move would enable SSOs to respond to shipper's expectation, based on a common understanding of their need for increased flexibility in all sectors, close to consumption areas.*
- *Government and NRAs need to ensure that value of positive insurance and system externalities created by gas storage are assessed and adequately captured in the regulatory framework.*
 - ✓ *Introducing externalities into the market would enable SSOs to be remunerated for the crucial system and insurance value that are not revealed and therefore not financially compensated by the market and/or paid by market participants.*
 - ✓ *Any remuneration should be covered by all relevant energy system users who benefit from these externalities.*
Hereby ensuring the proper functioning of the energy system to all market participants acknowledging the increasing values of storage in a decarbonized market.
- *In doing so, the current 'silo' approach should be moved towards a more holistic view in optimization of an investment planning across the entire energy system.*
 - ✓ *This is all by taking into account that the system value of gas storage to the whole integrated and decarbonized energy market, including the electricity one, will drastically increase.*
 - ✓ *Moreover, the resilience of the entire energy system will be provided as a service evolving and charged according to real usage (enabling customer to benefit from service that promptly follows with their requirement).*
 - ✓ *Even the avoided cost that generates the methanation could be integrated in the new approach to lead the movement towards a less carbon intensive economy.*
 - ✓ *The remuneration would enable the electricity users to capture the full value of gas storage that is part of the requirement for achieving a decarbonized energy future. The regulatory framework should then allow an adjustment to electricity and gas network usage tariffs that would enable to receive cross-sectorial benefits.*



- **Gas storage as major flexibility provider could further facilitate market convergence towards the greener-mix by fostering the spread of renewable and low-carbon gases.**
 - ✓ *In choosing the measures, GIE is convinced that ‘there is no one fits all solution.*
 - ✓ *Consequently, any specific measure would need to be tailored to the local market, depending on MSs energy mix, the role of storage in different local markets and the decarbonization process. The final measure opted for should not hinder innovation and SoS.*
- **Only an evolving regulatory framework integrating the exploitation of positive economic and environmental externalities will meet emissions targets in a cost-effective manner.**
 - ✓ *There is a huge opportunity to leverage existing gas infrastructure for the transmission and storage of different gases, even green gases or renewable electricity.*
 - ✓ *Without doing so, there is a risk that too much storage will close and/or close in wrong locations.*
 - ✓ *A dynamic and modern approach should be considered.*

Towards sector coupling

Connecting sectors will be crucial for the energy transition's success. This means that an integrated approach shall be adopted to facilitate energy and carbon efficiency to mature properly, with moving energy technologies and moving economics and for a moving market design structure.

Therefore, we should avoid thinking only in end-solution, but value the infrastructures that keep us on the energy and carbon efficient track. Understanding the potential of the link between electricity grids and gas grids will certainly be of great help as a way to economize on infrastructure and energy transportation cost, while at the same time being able to let multiple sources reach multiple user markets (electricity system, built environment, industry, transport etc.).

The potential roles for gas across the various energy consuming should also be regarded as a continuous dynamic process with the potential substitution of natural gas with



biomethane/hydrogen, before reviewing the heat sector, power generation (where the interaction with renewables is at its most intense), industry and transport.

The gas remains central and the ultimate goal can be achieved much earlier and at the lowest cost if all the positive externalities are incorporated in the process. This key issue will improve cross-border understanding, appreciation and trust among stakeholders that are also part of the desired flexibility they look for and considered as a key value brought by gaseous energy carriers.

It also means that services offered by gas operators should be differentiated in the future according to the flexibility they offer to the market and see how they contribute to social benefit.

The transition to an efficient and virtuous energy system cannot be imposed but needs to be built according to an evolving model with the support of all stakeholders. We hope that this paper has provided all stakeholders with a better understanding of the proposed regulatory framework SSOs would like to implement to ensure that they will continue delivering their services under challenging market conditions.