FLORENCE SCHOOL OF REGULATION

ROBERT SCHUMAN CENTRE

POLICY BRIEF

A simple implementation of pan-European storage obligations

Introduction

About 1,100 TWh of natural gas can be stored in 115 storage facilities in 19 countries in the EU27 area,[1] accounting for 25-30% of European consumption in winter periods. Securing high storage filling levels can therefore reduce the impact of large demand shocks and supply disruptions on prices and gas availability in Europe.

The expected winter-summer price spread is the main driver of decisions by market participants to store gas. Price expectations might not fully reflect the cost of extreme demand/supply conditions. In the past year storage filling levels have been inconsistent with the price spread realised, and remained below the historical average (10% less as of January 2022).

Unprecedented price levels and potential threats to security of supply linked to dependence on Russia have led national and European institutions to consider introducing storage filling obligations.[2] The European Commission has recently put forward a proposal that *"[…] aims notably at ensuring that storage capacities in the Union, which are crucial to ensure security of supply, do not remain unused, to ensure that storages can be shared across the Union, in a spirit of solidarity. For that purpose, a mandatory minimum level of gas in storage facilities will reinforce the security of supply ahead of the winter 2022/2023 and for the following winter periods."*[3]

1 Source: GIE AGSI+ Transparency Platform https://agsi.gie.eu/

2 Communication on security of supply and affordable energy prices: Options for immediate measures and preparing for next winter, COM(2022) 138.

3 Proposal for a Regulation of the European Parliament and of the Council amending Regulation (EU) 2017/1938, COM(2022) 135 final, section 1c.

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The Commission's proposal provides (amongst other things[4]):

- a mandatory *"filling target"*: storage infrastructure in each Member State shall be full to at least 90% by 1 November each year (for 2022 the filling target is 80% because "*Member States will need some time to set up the necessary measures*");
- a mandatory *"filling trajectory"*: intermediate targets for each Member State in February, May, July and September (From 2023 onwards storage shall also be specifically monitored in February to avoid sudden withdrawals of gas from storage in the middle of the winter);
- a commitment by each Member State to take all necessary measures, including financial incentives and compensation for market participants, to ensure that the mandatory filling targets are reached.

We assessed the potential role of mandatory storage filling provisions in a recent policy brief[5] which was published before the RePowerEU Communication[6] and – most notably – before the Russian invasion of Ukraine, which triggered the Versailles agreement[7] to phase out European dependence on Russian imports. In this policy brief we propose a policy measure to ensure that a target storage filling level is achieved and maintained with the smallest possible impact on the functioning of the internal gas market.

The remainder of the document is organised as follows. In section 1 we present a basic version of the proposed model. In section 2 we discuss some variations on the basic model. Section 3 concludes by assessing the impact of the proposed measure on the functioning of the European gas market.

1. The basic model: auctions for storage obligations

In the model presented here, an auction is carried out to award storage capacity together with a filling obligation. The filling obligation is expressed as a set of minimum filling levels to be reached or maintained at pre-defined times in the thermal year. In the rest of the brief we refer to the bundle of storage capacity and filling obligations as 'storage obligations'.

The volume of storage obligations allocated to the market is set by public authorities at the European level.[8] Participants in the auction for storage obligations may bid negative prices if they expect a winter-summer gas price spread below the cost of storing gas.

Under normal market conditions, i.e. if no physical gas shortage occurs in winter times, the filling obligation does not constrain the destination of the gas once it is withdrawn from storage. As long as the minimum filling levels are met, the party awarded the storage obligation may use its gas to serve final consumers or trade it on the wholesale market. The physical destination of the gas stored under the storage obligation does not need to be predetermined under normal market conditions since the price will converge across Europe, ensuring that all consumers are supplied. However, a predefined agreement, on the lines of the solidarity mechanism provided in the Security of Supply Regulation (2017/1938)[9] is necessary to pre-determine which countries will consume the gas stored under the obligation if emergency conditions occur.

In the rest of this section we present the main elements of the model.

4 The Proposal also provides: i) exemption from transmission tariffs at storage entry and exit points for storage users in order to incentivise the use of storage; ii) certification of storage system operators to ensure that "*third Country entities*" do not put at risk security of energy supply in the EU.

5 E. Tesio, I. Conti and G. Cervigni, *High Energy Prices: a matter for policy intervention?* – Policy Brief 2022/06, available at https://cadmus.eui.eu/handle/1814/73596

6 REPowerEU: Joint European Action for more affordable, secure and sustainable energy, COM(2022) 108 final.

7 Available at https://www.consilium.europa.eu/en/press/press-releases/2022/03/11/the-versailles-declaration-10-11-03-2022/

8 In section 2 we discuss an alternative approach in which national targets are set independently by each MS.

9 Regulation (EU) 2017/1938 concerning measures to safeguard the security of gas supply and repealing Regulation (EU) No 994/2010.

Product definition

The product exchanged in the auction is defined as GWh of storage capacity:

- for a given thermal year;
- for a given entry-exit area; and
- with predefined filling level obligations, defined as minimum filling shares of the awarded capacity at selected points in time.

Forward allocation of the storage capacity for multiple years is possible.

Pooling storage capacity in each entry-exit area is not necessary, but some product standardisation may ease participation and therefore maximise competition in the auction. However, pooling storage capacity beyond the entry-exit area's geographical scope would not be recommended as participants might (and in general will) have different costs associated with storing gas in different entry-exit areas. This holds, for example, for a shipper serving consumers in a given entry-exit area faced with the option of buying storage obligations in different entry-exit areas.

Note that in the case that storage capacity is pooled all parties awarded storage obligations in the same entry-exit area pay the same tariffs for storage services and are subject to the same technical constraints, for example in terms of the injection and withdrawal paths. The cost of enforcing such product standardisation, if any, could be easily socialised, as happens today with some dispatch cost items.

Tariffs for the use of storage

By allocating storage obligations, public authorities create the demand for most of the existing storage capacity. In this perspective, use-of-storage charges have to be regulated and are additional to the clearing prices of the storage obligations.

Should different gas storage operators in the same entry-exit area have different unit costs, monetary transfers can be implemented to redistribute the proceeds of the uniform tariff charged for the use of storage among them.

Auction design

The design of the auction for storage obligations must effectively address the substitutability of gas stored in different entry-exit zones with the purpose of meeting the supply commitments of the party awarded the storage obligations.

The simultaneous multi-round auction design has been widely used to allocate multiple units of substitutable products. This makes it an obvious candidate for the storage obligations auction.

Monitoring of compliance and use-it-or-lose-it provisions

Assessing compliance with the minimum filling level obligations requires monitoring the injections and withdrawals of gas in and from storage by each awarded participant. This information, however, is already available as it is necessary to perform balancing.

As the storage cycle starts with injections, early detection of any missing injection is possible. Therefore, implementation of *use-it-or-lose-it* (UIOLI) provisions would allow replacement of the missing gas in storage in a relatively short time. The defaulting participant would then be held financially responsible for the cost of replacing the missing injections in storage. The risk of missing the storage filling target would then be modest.

Secondary trading

In the proposed model, a participant selected in the storage obligation auction (and therefore awarded capacity) would be allowed to fulfil its obligation with gas stored by a different party in the same entry-exit area.

Cost allocation and cost recovery

The proposed measure generates a net cost if the auction clearing prices (at least in some entry-exit areas) are negative. The total cost is split among the Member States proportionally to the benefit obtained by each of them. Each Member State may recover the total net cost as it sees fit, for example via a surcharge on transportation or via the tax system.

Note that assessing the benefits of this measure for each Member State requires a view on the economic mechanism with which such benefits are generated. Such benefits may consist in prevention of scarcity events (security of supply) or in lower wholesale prices in winter times. In the European Commission's words, *"A burden sharing mechanism is introduced, as although not all Member States have storage facilities in their territories, all will benefit from having a guaranteed high filling level, in terms of the insurance value against security of supply risks and price dampening effects in winter."* [10]

The possibility of preventing scarcity events depends on physical access to the stored gas,[11] which also depends on the availability of cross-border transmission capacity. In this perspective, it is fair to link the contribution by each Member State to the overall cost of the measure to the volume of stored gas that the Member State can physically access in the event of scarcity.

The possibility of mitigating price increases in winter depends on the price formation mechanism, which is driven by expectations of future market conditions and features gas-to-gas indexation as a common practice. All countries that source gas at prices that are correlated with the price prevailing in the market areas where the storage facilities are located benefit from storage obligations.[12] In this perspective, a Member State's total gas consumption appears to be a fair basis for assessing its contribution to the net cost of the measure.

2. Variations on the basic model

Variations on the basic model described in the previous section can be implemented. They differ in the dimensions discussed below.

Risk allocation

In the basic model presented in the previous section, bids in the storage obligation auctions are based on the participants' expectations of the winter-summer price differential. The risk that the actual winter-summer price differential turns out to be different from the expected one is borne by the parties that are awarded storage obligations.

A different allocation of this risk could be obtained with an alternative product definition, in which:

- the physical obligation is defined as in the basic product; and
- participants in the auction still bid a price for the storage obligation; but
- there is an additional payment to/from the party awarded a storage obligation. This payment is assessed ex-post and is equal to the actual difference between the winter and summer price benchmarks (e.g. TTF prices) based on a standard injection/withdrawal time profile.

In this case, the participant does not bear any price-spread risk.[13] This approach may be preferred at times when uncertainty about future price spreads is exceptionally high and so are the risk premia required by the participants in the storage auctions.

Pro-rata allocation of storage obligations to shippers or retailers

In the basic version of the proposed model the parties on which the filling obligation falls are selected in auctions. An alternative approach would be to place the obligation *de jure* on:

- any shipper importing gas in Europe, in proportion to the imported volume, or alternatively on
- any retailer supplying European consumers in proportion to the volume supplied.

This design might lead to inefficiencies, i.e. higher than necessary costs for European consumers, in the case that shippers or retailers characterised by higher costs for fulfilling the storage obligation are not able to transfer the obligation to more efficient parties.

Furthermore, the administrative and monitoring costs in a model based on *pro-rata* allocation might be higher than in a model based on auctions.

10 Proposal for a Regulation of the European Parliament and of the Council amending Regulation (EU) 2017/1938, COM(2022) 135 final, section 5.

11 Along this line is the European Commission's proposal that a country with no storage capacity resorts to storage capacity located in neighbouring countries, but only to the extent that sufficient interconnection capacity to move that gas to the beneficiary country is available. See Article 6c. of the Proposal for a Regulation of the European Parliament and of the Council amending Regulation (EU) 2017/1938, COM(2022) 135 final.

12 For example, consider Spain, a country with limited interconnection with the central European market. Despite this, Spain's long term gas procurement contracts may be indexed to TTF. If that were the case, Spanish consumers would benefit from the price-mitigation effect of storage obligations independently of their physical access to the stored gas.

13 If the profile is pre-determined, the proposed model provides correct incentives to the party awarded storage obligations to implement the efficient injection and withdrawal profiles.

National storage obligations

As an alternative to pan-European allocation of storage obligations, independent national definition, allocation and enforcement of storage obligations could be implemented. In this approach a Member State would, independently from the others, set up its own stock of stored winter gas, possibly using storage capacity located in other countries.

This model might require less coordination among Member States at the definition stage. Each Member State would independently allocate among market participants a potentially different obligation to store gas. The Member State could even enrich the storage obligation by adding a duty of physical delivery to the different Member State where the gas is stored, independently of the relative prices of gas in the Member State and in the storage country prevailing at the time of delivery. For this reason, it can be expected that coordination at the enforcement stage would be more demanding in this model, if anything because gas flows across borders would have to be tagged and tracked with the purpose of monitoring compliance.[14]

Finally, national storage allocation would make it impossible to address the substitutability of entry-exit areas for the market participants to store gas. This may result in allocation inefficiencies and higher than necessary costs.

Bundling storage and cross-border transportation capacity in the auction

The possibility of buying bundles of storage and cross-zonal transmission capacity in the same auction would allow shippers to lock in the cost of storing gas to be consumed in a different area in an entry-exit area. This option might be valuable in the case that storage capacity and demand (particularly during winter) are unevenly distributed across the different entry-exit areas. If this happened, some entry-exit areas might end up exporting a sizeable portion of the gas in their storage fields because of the filling obligation. In this case, bundling storage obligations and transmission capacity would reduce the risk for the shipper of moving gas from the storage area to the destination area.

Additional constraints

The definition of the storage obligation may include constraints that are additional to the minimum filling level at predetermined times. For instance, one such constraint may relate to the country of origin of the gas used to fill the awarded storage capacity.

Conclusions

Our analysis suggests that minimum storage filling obligations can be implemented in Europe while preserving the general organisation of the industry, in particular the role of competition in importing, wholesale trading and retailing gas in Europe is largely unaffected by the model we have presented.

Given the size of the filling obligation envisaged by the Commission (90% by 1 November each year[15]), regulation of gas storage tariffs might be required, but that does not appear to be a game-changer with the current gas sector organisation.

The model we have presented is highly flexible in that it is compatible with different risk allocation patterns between European consumers and shippers. Furthermore, it allows implementing additional constraints, including on the origin of the gas imported to Europe, and would pursue the two targets of i) improving European security of gas supply and ii) reducing wholesale gas prices across Europe.

Finally, the concept of pan-European allocation of resources located in the different Member States is not new, if anything because this model has been implemented for some time for cross-border gas transmission capacity, and even more extensively for the allocation of cross-border capacity in the electricity sector. For the same reason, relatively low costs can be expected for setting up and managing the allocation process and for monitoring compliance with the minimum storage filling obligations.

14 Along this line is the EU Commission proposal for a "*burden sharing*" mechanism providing obligations for Member States without storage facilities i) to ensure that domestic market participants have arrangements with storage system operators from Member States with storage facilities for volumes corresponding to at least 15% of the annual gas consumption; and ii) to ensure financial compensation for market participants for the cost incurred because of the obligations. See Article 6c. of the Proposal for a Regulation of the European Parliament and of the Council amending Regulation (EU) 2017/1938, COM(2022) 135 final.

15 Communication on security of supply and affordable energy prices: Options for immediate measures and preparing for next winter, COM(2022) 138.

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