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**Changing gas storage usage and
effects on security of supply**

CEER interim report

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INFORMATION PAGE

Abstract

This interim report (C13-GWG-102-03) examines changing gas storage usage in Europe and effects on security of supply. It presents the results of a CEER questionnaire that was sent to storage users and storage operators in order to gain understanding why less storage capacity was booked during the last storage season and to gain an outlook on future booking behaviour. This report also describes the possible effects of booking behaviour on the security of supply.

Target Audience

European Commission, Storage system operators, storage customers, traders, suppliers, Member States, academics and other interested parties.

Keywords

Storage levels and storage use in Europe; the role of storage in security of supply; reasons for booking storage capacity.

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Related Documents

CEER documents

- “Amendment of the Guidelines of Good Practice for Third Party Access (TPA) for Storage System Operators (GGPSSO): Guidelines for CAM and CMP”, CEER, 14 July 2011, Ref. C11-GST-15-03, http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/CEER_PAPER_S/Gas/Tab/C11-GST-15-03_amdt%20GGPSSO%20on%20CAM%20and%20CMP_14-July-2011.pdf

External documents

- Regulation (EC) No 715/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the natural gas transmission networks and repealing Regulation (EC) No 1775/2005, <http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:211:0036:0054:EN:PDF>
- “Medium-Term Gas Market Report 2013”, IEA, 2013



Table of Contents

EXECUTIVE SUMMARY	5
1 INTRODUCTION.....	7
1.1 Background.....	7
1.2 Customer perspective	8
2 THE ROLE OF STORAGE FACILITIES IN THE GAS MARKET	9
2.1 Reasons for booking storage facilities	9
2.2 Reasons why less storage capacity was booked.....	9
3 OUTLOOK ON FUTURE BOOKING BEHAVIOUR OF STORAGE CAPACITY	11
3.1 Demand for flexibility	11
3.2 Competitiveness of storage flexibility with other flexibility tools.....	12
3.2.1 Price of storage flexibility	12
3.2.2 Seasonal flexibility	12
4 (EFFECTS ON) SECURITY OF SUPPLY	13
4.1 New investments in storage facilities.....	13
4.2 Role of security of supply in booking storage capacity	13
4.3 Stakeholders' view on EU rules on security of supply.....	13
4.4 (Impact of) national obligations on storage facilities	14
5 INITIAL CONCLUSIONS	15
ANNEX 1 – CEER	18
ANNEX 2 – LIST OF ABBREVIATIONS	19
ANNEX 3 – OVERVIEW OF NATIONAL STORAGE OBLIGATIONS	20
ANNEX 4 – CEER QUESTIONNAIRE	22



EXECUTIVE SUMMARY

At the end of the storage season 2012/2013, Europe faced lower than normal gas storage stock levels and a delayed start to the injection period. Given the importance of gas storage, Council of European Energy Regulators (CEER) decided to get a more detailed understanding of these recent events. CEER aimed to understand shippers' reasoning for booking and/or using less storage capacity during the last storage season. For this purpose, CEER developed a questionnaire which was sent to organisations that a) represent storage users (such as shippers and traders) or Storage System Operators (SSOs), or b) that have an in-depth knowledge of the storage market. Based upon the responses received (Eurogas, OGP, GSE and Vattenfall) CEER has drafted this interim report, which can serve as a starting point for a strategic discussion on (the role of) storage as requested during the 24th Madrid Forum (October 2013).

Main findings

The reasons for booking storage capacity have not changed

CEER has no reason to believe that the purposes for booking storage capacity will change in the (near) future. Storage facilities (as a rule) are used for portfolio optimisation and meeting flexibility requirements. In addition, storage facilities are an important tool to secure gas supply and to ensure that Security of Supply (SoS) obligations can always be fulfilled. Storage facilities are also used as a financial instrument. Storage enables network users to arbitrage due to short and long term differences between prices on spot and forward markets. Also, storage enables users to take advantage of seasonal variations in price (or the seasonal price spread): gas can be bought at (lower) summer prices, stored, and then used to meet (higher priced) winter demand. As such, seasonal storages provide a competitive edge by benefiting from the spread.

Less flexibility needs and availability of other (cheaper) sources of flexibility explain low booking levels

CEER considers that less storage capacity was booked during the last storage season for a number of reasons. On the *demand* side, physical demand for gas has declined due to economic downturn. Also, due to the gas-to-coal competition, gas is currently less favourable as a generation fuel. Both reasons have resulted in less need to book storage capacity. On the *supply* side, sufficient flexibility is currently available in the European gas market through other sources of flexibility at low(er) prices than storage flexibility. Due to these price differences (and low summer-winter spread providing little incentive to book storage capacity), network users currently manage their portfolio requirements through means other than storage facilities. One such way is buying flexibility at gas hubs. Also, flexibility of the network has increased, supported by enhancing reverse flow capacity.

The demand side for flexibility will likely recover in the future

CEER believes that the demand side for flexibility will likely recover in the future. Given the intermittent character of renewables, gas fired power plants will serve as a *backup fuel* to balance the electricity grid. Further, it can be expected that physical demand for gas is likely to increase with economic recovery. Furthermore, gas demand is also likely to increase when gas becomes a favourable generation fuel again, sparking use of gas fired power plants. Finally, any growth in gas demand might be affected by new European rules e.g. on energy efficiency (in turn decreasing flexibility needs).



Price will determine the competitive edge of storage flexibility

CEER considers – as market participants do – that the market for flexibility is a commercial market. Decision making on which flexibility tool to use should be based on commercial and economic considerations and all flexibility sources should “meet in the market”. The demand side of the flexibility market is thus price driven and economics play a role when choosing which flexibility tool to use. Whether storage flexibility can compete with other flexibility tools thus depends not only on the price, but also the development of the summer – winter spread. However, transmission costs also play an important role whether storage facilities can compete with other flexibility tools. Market participants consider that the entry and/or exit tariff should reflect actual costs and recognise the benefits that storage facilities provide to the grid. This would create a level playing field for storage amongst other flexibility tools available. The Framework Guidelines on Tariff Structures is likely to contribute to this aim.

Outlook on (short and long term) availability of storage capacity

Comparing forecasts of the development of EU gas demand (according to the International Energy Agency (IEA) and the expansion of storage capacity (by 36% from 2006 to 2012)), CEER has reason to believe that current storage capacity is sufficient to meet European gas demand in next five years, assuming that forecasts of flexibility needs will not severely change in the near future. It is thus not likely that the postponement of investments in new storage facilities will have an adverse effect on SoS in the short term. Whether this is also the case in the medium term depends on several developments. Building a storage facility takes several years. At present however, there is little willingness amongst storage users to make long term commitments. Also, storage facilities (as a result of the shift towards short term) might become less attractive, which could lead to mothballing/shut downs.

Based on received responses, it is not clear for CEER whether this lack of willingness amongst storage users is only temporary (e.g. price related) or more permanent (long term commitments are no longer desired). CEER is of the opinion that this issue needs to be better understood and will further investigate this. However, CEER (based upon stakeholders’ feedback) does have reason to believe that a shift towards more short term flexibility products will take place. This shift could result in seasonal storage facilities becoming less attractive. CEER considers that the latter could have considerable impact on security of supply, especially in countries within a high dependence on imports or where storage is major physical source of flexibility.

Considerations on possible EU-actions

CEER considers that the market for flexibility – storage facilities included – is a commercial market. Any (SoS) interventions will have an impact on the (future) business cases to build new storage facilities. The market for flexibility/storage should thus be disturbed as little as possible. Any interventions taken (if necessary at all) should be appropriate for the national and regional flexibility markets and should be transparent and proportionate not charging network users with unnecessary costs which would inevitably be reflected in the price paid by final customers. These interventions should not distort the market, neither for commodity, neither for flexibility services, and should be in line with the overall storage access regime as defined at a national level. Also, no measures should be introduced unless there is clear evidence that market failure will occur – which currently does not seem to be the case – if no action is taken. CEER also considers that the legal and regulatory framework of the storage market determines the possibility for action to be taken to ensure a level of storage use is met for the purpose of SoS. Any possible intervention should fit with the concept of improving SoS in the EU which is set out in the Regulation 994/2010. This comprises also the idea of developing a more regional flexibility market, using storage capacity in neighboring countries.



1 Introduction

1.1 Background

Stock levels in Europe

At the end of the 2012/2013 gas storage season, the stock levels of storage in many European countries were – in comparison with previous years – reported as being very low (in total 20%).¹ In few cases, storage was evidently even almost empty. In addition to low stock levels, several countries witnessed end-of-season withdrawals continuing into May, whereas the injection phase for seasonal storages usually starts in April. While these two events – especially late withdrawals – are not common practice, they can be partly explained by the fact that Europe had a long winter with a number of cold spells, some taking place late in the season.

However, GSE also concluded² that stock levels in many countries during last storage season were persistently lower in comparison with previous years. One explanation could be that shippers – given the current summer/winter spread – consider it cheaper to buy gas in the winter e.g. at the hub instead of buying gas in the summer and storing it (thereby also paying a storage fee). If this is true, stock levels will likely go up once the spread rises again. However, the explanation could perhaps also be found in changing shippers' behaviour.

Launch of CEER project

Although it is clear that stock levels throughout Europe were lower than usual last year, it is not fully clear a) how these events are explained and b) to what extent shippers' recent booking behaviour is only temporary (e.g. spread related) or more permanent. In parallel, it is not clear whether SoS obligations were (or will be) in danger due to lower stock levels. Given the importance of gas storage, CEER has decided to get a more detailed understanding of these recent events. In this regard, CEER aims to address the following questions:

1. Understand shippers' reasoning for booking less storage capacity during the last storage season and/or having less gas in storage in comparison to previous year(s);
2. Understand to what extent shippers' booking behaviour during the last storage season is temporary (e.g. spread related) or permanent (e.g. changing shipper behaviour);
3. Determine whether any (immediate) action is required (and by whom).

Project approach

In order to address the questions above, CEER has developed a questionnaire (available as an Annex 4 of this report) which was sent to organisations that a) represent storage users (such as shippers and traders) or storage operators (SSOs) or b) that have an in-depth knowledge of the storage market.

¹ Source: GSE, AGSI, <https://transparency.gie.eu.com/index.php#>

² GSE presentation delivered to the Gas Coordination Group on 13 December 2012.



Based on the responses received,³ CEER has drafted an interim report in order to present these initial findings at the 24th Madrid Forum, held in October 2013. The final report will be presented to the Gas Coordination Group and the Madrid Forum in 2014.

In this interim report, CEER addresses the questions that are outlined above. For the avoidance of doubt, it is emphasised that the report is based primarily on the responses received to the questionnaire, but also public documents and CEER's observations.

1.2 Customer perspective

The demand for gas in European countries (especially for households) differs throughout the year. For example: during the winter time gas demand is higher than during the summer (seasonal difference), while normally more gas is used during business days in comparison to the weekends (weekly difference). Because demand and supply of gas differ, suppliers of gas have the responsibility to ensure that the amount of gas used by their customers (withdrawal from the grid) is always equal to the amount of gas that is injected into the gas grid. In gas terms: a supplier must thus *balance its portfolio* and to so it needs to have access to what is known as flexibility. There are several flexibility tools available in the market. The most known tools are flexible gas production, import contracts, line pack, interruptible contracts, hub related products and storage facilities.

Suppliers who book storage capacity inject a certain amount of gas in a facility and withdraw this gas whenever they need the gas to balance their portfolio. However, storage facilities are also used for trading purposes (for example arbitrage) and for Security of Supply reasons (stored gas is only used to meet gas demand if no other gas is available anymore). However, during the spring of 2013 CEER noticed that the amount of gas stored in storage facilities – in comparison to previous years – was being reported as being very low. Storage facilities have no use if no gas is actually stored in these facilities. For this reason and the role that storage facilities play, CEER launched a project. The aim of this project is to understand why less gas is stored in storage facilities and whether it can be expected that this will also be the case in the future (and thus whether any action is needed). The results of this project are explained in this report.

³ The following organisations have responded to the questionnaire: Eurogas, OGP, GSE and Vattenfall.



2 The role of storage facilities in the gas market

As explained in the previous chapter, CEER would like to understand to what extent shippers' different booking behaviour during the last storage season is temporary or permanent and – based upon the results – whether any action is needed. In order to do so, the reasons for booking storage capacity and in particular the reasons for booking less storage capacity during the last storage season and/or having less gas in storage in comparison to previous year(s) need to be known. Both questions (based upon the responses received) are answered below.

2.1 Reasons for booking storage facilities

Storage facilities – both long term (seasonal) and short term (fast cycling) – are considered an important flexibility tools in the European gas market. However, other flexibility tools are also available in the market (such as flexible gas production, import contracts, line pack, swaps, interruptible contracts, scale down contracts, Liquefied Natural Gas (LNG) and hub related products). In this respect, several market participants consider that storage facilities – depending on the type of flexibility and volume needed – compete with these flexibility tools.

Storage facilities are used by market participants for different purposes. As a rule, they are currently (as in the past) used for portfolio optimisation and meeting any flexibility requirements (both peak demand and seasonal). With regard to the latter, fast cycling storage facilities are in general used to meet daily variations in demand, while seasonal storages cover seasonal variations of the demand. Next to that, storage facilities are an important tool for ensuring that any security of supply obligations (e.g. forthcoming from SoS regulation or national obligations resting on household suppliers) can always be fulfilled. In countries, where import dependency is high and diverse supply sources are lacking, storage plays a major role in securing gas supply to fulfil the contractual obligations when supplying end customers.

While the reasons above can be referred to as physical purposes, storage facilities are also used as a financial instrument. Amongst other purposes, it enables network users to arbitrage due to short and long term differences between prices on spot and forward markets. Also, seasonal storages can provide a competitive edge by benefiting from the summer-winter spread: (lower) summer gas prices are used to meet (higher) winter demand.

2.2 Reasons why less storage capacity was booked

There are a number of reasons why less storage capacity was booked during last year and during the current storage season. First of all, on the *demand* side (due to the economic downturn that Europe is currently facing), the physical demand for gas has declined. Next to that, (many) gas fired power plants currently show a decreased use or are even mothballed because gas – due to the gas-to-coal competition – is less favourable as a generation fuel (coal is currently cheaper).⁴ As a result, market participants may have less flexibility needs and thus less need to book storage capacity.

⁴ The coal-to-gas competition is, amongst other reasons, sparked by the US shale gas revolution (coals are now exported by the US, influencing the coal prices in Europe).



On the *supply* side, sufficient flexibility (both short term and long term) is currently available in the European gas market through other sources of flexibility at low(er) prices than storage flexibility.⁵ Due to these price differences, network users currently manage their portfolio requirements through means other than storage facilities (affecting the level of booked storage capacity). One way of managing portfolio requirements is buying flexibility at (virtual) gas hubs. The liquidity of hubs in the (North West) European gas market has increased in recent years, leading to enhanced reliability of hubs as a supply source. This was the trigger for market participants to create and offer flexibility products at hubs.⁶ Also, the flexibility of the network has increased, supported by enhancing the reverse flow capacity.

As already explained, seasonal storages can provide a competitive edge by benefiting from the summer-winter spread. Due to the current summer/winter spread (which is very low), however, network users have little incentive to book seasonal storage capacity. They consider it cheaper to buy gas in the winter (e.g. at the hub) instead of buying gas in the summer and storing it for withdrawal in the winter. Some market participants argue that network users currently book less storage capacity because of upfront investment and to reduce working capital costs. When using seasonal storage facilities as flexibility tool, network users need to buy gas in the summer and the costs associated with this purchase can only be recovered in the winter (once the gas is sold).

⁵ Some market participants consider that the oversupply of gas has eroded the price signal to storage, making storage flexibility less attractive.

⁶ Some market participants consider that buying gas at a gas hub is not as reliable as stored gas.



3 Outlook on future booking behaviour of storage capacity

In the previous chapter, the most important reasons why network users have booked less storage capacity during the 2012/2013 storage season were presented. This chapter explores whether shippers' booking behaviour during the last storage season is only a temporary development or more permanent. CEER considers that whether more or less storage capacity will be booked in the future will depend on the actual demand for flexibility and the competitiveness of storage facilities in comparison to other flexibility tools on the supply side. These two issues are examined below.

3.1 Demand for flexibility

The demand side for flexibility will likely recover in the future, although changes in the precise demand are likely to be witnessed. One important game changer is the fact that the share of renewables (such as solar and wind) in the European fuel mix is expected to grow significantly in the upcoming years. Given the intermittent character of renewables, gas fired power plants – due to their characteristics⁷ – will serve as a *back up fuel* to balance the electricity grid. Further, it is likely that the physical demand for gas will increase again when the economic downturn is reversed. However, no one can (precisely) predict when this turnaround will take place, although it is not likely that this will happen in the short term as currently there are no clear recovery signals. Additionally, gas demand is also likely to increase once gas becomes a favourable generation fuel again, sparking the usage of gas fired power plants. This will require though that gas is the winner of the gas-to-coal competition and it is not clear whether this will happen without any energy politics (e.g. changing ETS-system). Finally, any growth in gas household demand might be affected by European rules for example on energy efficiency (in turn decreasing flexibility needs). The precise effects of such developments, however, are difficult to foresee.

It can also be expected that the need for short term flexibility will increase once several developments (such as gas fired power plants increasingly serving as back up generation to intermittent renewables) have materialised. However, also the implementation of the Network Code on Balancing – introducing a daily balancing regime throughout the European Union – will introduce a shift towards more short term flexibility, because network users need to balance their portfolio on a daily basis.⁸ Finally, shippers' behavior also impacts the need for short term flexibility. During the last three years, storage operators have (already) witnessed storage requests mainly coming from trading companies that have an interest in short term contracts for storage capacity. Also, storage operators consider that network users book less storage capacity and utilise the booked capacity to the fullest extent possible.⁹ Accordingly, storage operators believe the emphasis will be predominantly on delivery rates to make use of short term arbitrage opportunities and much less on work gas volume.

⁷ Gas fired power plants have the ability – contrary to coal fired and nuclear power plants – to quickly ramp up or down its production whenever more or less electricity needs to be produced.

⁸ However, the free availability of line pack will (likely) decrease the need and price for within day flexibility.

⁹ In this respect, storage operators have witnessed during last winter period stock levels reach around 10 percent or even lower as



3.2 Competitiveness of storage flexibility with other flexibility tools

3.2.1 Price of storage flexibility

The market for flexibility – of which storage facilities are a part (or should be a part) – is considered to be a commercial market in which the level of competition is high. Any decision making on which flexibility tool will be used should be based on commercial and economic considerations. As such, all flexibility sources (storage facilities included) must “meet in the market”.¹⁰ Some market participants are of the opinion that a stable regulatory framework is needed to ensure a commercial flexibility market can truly develop. They consider that any regulatory rules on the allowed or mandatory booking of storage capacity (preferred access) should be removed. The demand side of the flexibility market is thus (becoming more) price driven and economics play a role when choosing which (short term or long term) flexibility tool to use. Whether storage flexibility can compete with other flexibility tools thus depends on the price.

Generally, users of a storage facility (next to buying the gas to be stored) pay a storage fee and a transmission fee (entry and/or exit tariff). Market participants consider that transmission costs – next to the availability of firm transmission capacity to and from storage facilities¹¹ – play an important role whether storage facilities can compete with other flexibility tools. The entry and/or exit tariff should therefore reflect actual costs and recognise the benefits that storage facilities provide to the grid. As such, a level playing field is created for storage in relation to other flexibility tools available. In the draft Framework Guidelines on rules regarding harmonised transmission tariff structures, rules are introduced that relate to these transmission fees. NRAs, when setting or approving the allocation of costs to entry and exit points from and to gas storage facilities, must consider two aspects: a) has an entry fee been paid before entering the grid and an exit fee paid when exiting and b) the need to promote efficient investments in networks. Once these rules are *up and running*, storage flexibility should be more competitive with other flexibility tools.

3.2.2 Seasonal flexibility

As already mentioned, seasonal storages can provide network users a competitive edge by allowing them to benefit from the summer-winter spread. To be able to actually benefit from these arbitrage opportunities, the summer-winter spread needs to cover at the minimum the storage costs (including transmission tariffs). At this point in time, the spread is at an (all time) low and arbitrage opportunities (when factoring in storage and transmission fees) are rather limited. From an economic point of view, market participants have little incentive to book seasonal storage capacity, especially now that sufficient flexibility (due to the economic downturn) is available in the market at a lower price. If the summer-winter spread rises again (which is likely to occur when the availability of gas in the market diminishes), arbitrage opportunities will also increase. It can be expected that more seasonal storage capacity will be booked under these circumstances. However, it is very difficult to predict when this might happen. At this point in time, no clear signs of recovery are visible yet.

¹⁰ In turn, it enables investors to make a truly market based decision to (not) build new storage facilities.

¹¹ Such grid restrictions can limit access to facilities and consequently impact the level of subscription.



4 (Effects on) security of supply

In the previous chapters, the most important reasons why network users have booked less storage capacity during the 2012/2013 storage season were presented. Also, it was explored whether shippers' booking behaviour during the last storage season is only a temporary development or more permanent. In this chapter, CEER presents the effects on security of supply.

4.1 New investments in storage facilities

In 2008, many European countries faced the need to invest in new storage facilities as to ensure that peak demand could always be met. However, due to factors such as the economic downturn, existing flexibility tools have proven to be sufficient so far to meet any market demand. As a result, many investments in new storage facilities were put on hold, because the business case was not adequate. Today, storage operators are finding that network users have little willingness to make the long term commitments that are needed to justify an investment in storage facilities. Without such commitments from storage users, it is difficult for investors to justify the large investment that is needed for building a storage facility. It can therefore be questioned whether sufficient new storage facilities will be built to ensure that peak demand in the future – once demand goes up again – can be met. Storage operators believe that no new investment in storage facilities can be expected, with the possible exception – given the shift towards short term flexibility – of some fast cycle facilities located close to liquid markets.

Storage operators also consider that seasonal storage facilities, as a result of the shift towards short term flexibility, might become less attractive for network users. In an extreme case, this shift might result in mothballing or even shutting down such facilities. The latter is considered an irreversible step and will have impact on security of supply in countries within high dependence on imports or where storage is a major (physical) source of flexibility.

4.2 Role of security of supply in booking storage capacity

As already explained, the demand side of the flexibility market is (becoming more) price driven and economics play a role when choosing which (short term or long term) flexibility tool to use. Whether storage facilities can compete with other flexibility tools will thus depend for a large part on the price. Currently, it is difficult to understand whether the function of storage to physically secure gas supplies in case of disruption or extremely high demand is valued by the market and has to be further investigated.

4.3 Stakeholders' view on EU rules on security of supply

As already explained, the market for flexibility is considered to be a commercial market in which the level of competition is high. As such, market participants consider that any intervention should be carefully analysed, as intervention in the market could distort the proper functioning of the (flexibility) market. Any intervention should thus be implemented only after all market based measures have been exhausted, and applied measures should be transparent, non-discriminatory and publicly known. Also, any regulation must be stable to allow the proper inclusion of this mechanism in commercial and financial decisions regarding storage investments.



However, it is recognised that due to national circumstances some specific national requirements might be necessary. In such cases, differences in national markets justify different national approaches, but different factors (e.g. LNG availability, level of interconnection, supply diversity) should be taken into account in determining a national framework. Strategic storage at an EU level policy is seen as something that should be avoided.

4.4 (Impact of) national obligations on storage facilities

In some countries, storage obligations for supplying end customers are issued (see Annex 3 for full overview).¹² These countries are Hungary, France¹³, Italy, Slovakia, Spain and Portugal. In all these countries storage capacity plays an important role in supplying end customers in the winter season, in particular on peak days. Furthermore, Hungary has a special security (strategic) storage unit, which exists exclusively for the supply of protected customers. The strategic storage is an instrument to supply gas in *emergency cases*.

On the other hand, countries like Portugal and Spain have not experienced low stock levels after the winter and will not take additional measures. Some Member States with storage obligations like Hungary and France faced lower storage levels in September compared to the previous years; the storage level in Hungary is still the lowest in Europe at the moment.

¹² For the avoidance of doubt, it is emphasised that this list is based upon responses received from the following countries: France, Spain, Portugal, Hungary, Slovakia and Austria. It might be the case that other countries also have national obligations.

¹³ The Ministry has announced that they will reinforce their cooperation with adjacent Member States in order to best prepare for potential supply disruptions next winter. In addition, the Ministry is now considering changes to the rules on third party access to storage and storage obligations, which would only be applied in view of winter 2014-2015. These proposals are currently submitted to public consultation.



5 Initial conclusions

Storage facilities will serve same purpose as currently is the case

Based upon the responses received to the questionnaire, CEER has no reason to believe that the reasons for booking storage capacity at storage facilities will change (in the near) future. As such, storage facilities will continue to be used for physical purposes (such as meeting any flexibility requirements), but also for financial purposes (such as arbitrage opportunities). Although the levels of storage usage have been lower in the past year, CEER considers that the demand side for flexibility will likely recover in the future. This is likely to happen once the economic downturn is reversed, but will also be influenced by the outcome of the current gas-to-coal competition in Europe. Although no one can predict when this turnaround will take place, it will probably not be in the short term.

The demand side of the flexibility market is highly price driven

Based upon received responses, CEER considers that the demand side of the flexibility market is price driven and economics play a key role when choosing which flexibility tool to use. Whether storage flexibility can compete with other flexibility tools depends on the price. As long as other flexibility tools are cheaper, it is not likely that market participants will book storage capacity. In itself, in terms of security of supply this is not necessarily a problem as long as sufficient flexibility is available through other sources, a prerequisite being that cross-border interconnection capacity levels remain stable. However, if peak demand is extremely high and other flexibility sources cannot deliver sufficient flexibility (and storages are not filled), this could result in peak demand not being met.

A shift to short term is (likely) to take place

CEER, based upon stakeholders' feedback, has reason to believe that a shift towards more short term flexibility products will take place.¹⁴ This shift will increase once several developments (such as gas fired power plants serving as back up fuel and also implementation of the Network Code on Balancing¹⁵) will have materialised. If this will indeed result – as suggested by some respondents – in seasonal storage facilities becoming less attractive (and even mothballing or shutting down), CEER considers that this could have serious impact on security of supply in countries with high dependence on imports or where storage is major physical source of flexibility. The precise effect will depend on whether the summer-winter spread rises again in the (near) future. If it does, arbitrage opportunities increase and CEER believes that market participants will have an economic incentive to book seasonal storage capacity.

Sufficient storage capacity is available on the short term

Comparing forecasts of the development of the EU gas demand (IEA) and the expansion of storage capacity (by 36% from 2006 to 2012), CEER has reason to believe that current storage capacity is sufficient to meet European gas demand in the next 5 years. It is therefore not likely that the postponement of investments in new storage facilities (as a result of the economic downturn) will have an effect on security of supply in the short term.

¹⁴ This does not necessarily imply that the long-term flexibility needs will disappear.

¹⁵ The Network Code on Balancing does not change the short term physical flexibility need but only incentivises users to cover these needs on the short term market instead of directly subscribing a tolerance offer from the storage or transmission operator.



Whether this will also be the case in the medium term (more than five years) is dependent on a number of developments.

Sufficient storage capacity availability on the long term depends on certain aspects

Building a storage facility (including licensing procedures) takes several years. Ensuring that sufficient storage capacity is available thus requires Final Investment Decisions (FIDs) for storage facilities – and subsequently construction activities – to take place in advance of capacity shortages. However, investments in new storage facilities will usually only take place if storage users are willing to make the long term commitments that are needed to justify such a decision. Currently, there is little willingness amongst network users to do so and based upon received responses it is not clear for CEER whether this lack of willingness is only temporary (e.g. price related) or more permanent (long term commitments are no longer desired).¹⁶ Also, it is not clear whether storage users will make long term investments – even if the price of storage flexibility is not competitive or long term bookings are no longer business as usual – if they believe that there will be insufficient storage capacity in the future, hindering their ability to meet delivery requirements to their customers. CEER is of the opinion that this issue needs to be better understood and will further investigate this area.

If the lack of willingness to make long term commitments is price related, it can be expected that storage users will make such commitments once the price of storage capacity is more competitive again against other flexibility tools. Although it is (at this point in time) difficult to predict when this might happen, measures can be taken to make storage flexibility more attractive. In the drafting process of the Framework Guidelines on Tariff Structures, one such measure (allowing a discount on transmission fees to and from storage facilities) is already being tackled. Although respondents have brought forward a number of other remedies such as removing regulatory bottlenecks, CEER considers that a more precise analysis on possible bottlenecks and solutions is needed.¹⁷ However, if network users do not want to make long term commitments anymore (regardless of price signals), it might be necessary to change the way investments are organised. This is currently being carried out for transmission capacity.

More insight is needed whether sufficient storage capacity will be in place

Based upon received responses, CEER has produced this report presenting an overview of storage issues on a European level. However, CEER is well aware that the gas markets throughout the European Union are at different stages. The North West European gas market for example is characterised by a number of liquid hubs and multiple sources of gas and cross-border interconnections, allowing network users to use other flexibility tools (such as buying gas at the hub). In contrast, hubs in certain parts of Eastern Europe are not yet established or have not reached a level of maturity to act as a (real) substitute for storage flexibility. The conclusions in this report are thus not one-on-one applicable to all countries in the European Union. For this reason, CEER believes that further investigation at a country level is needed to determine a) whether (intended) builds of storage facilities is sufficient to meet expected future peak demand and b) whether booking behavior (for new investments) is changing.

¹⁶ The gas market – as a result of the coming into force of the 3rd Package and the development of network codes – is rapidly changing, impacting business as usual in the gas market (possibly also the storage market).

¹⁷ Even if making long term commitments would not be business as usual anymore, tackling bottlenecks will ensure that existing capacity will be more booked.



Considerations on possible EU-actions

As brought forward by respondents, CEER considers that the market for flexibility – storage facilities included – is a commercial market. Any SoS interventions introduced to this market will have an impact on the (future) business case to build new storage facilities. The market for flexibility/storage should thus be disturbed as little as possible.¹⁸ Any interventions taken (if absolutely necessary) should be appropriate for national and regional flexibility markets and should be transparent and proportionate in order to avoid putting unnecessary costs on network users which would then be reflected in the price paid by final customers. These interventions should not distort the market and should be in line with the overall storage access regimes, as defined at a national level.¹⁹

Also, no measures should be introduced unless there is clear evidence that market failure will occur – which currently does not seem to be the case – if no action is taken. CEER also considers that the legal and regulatory framework of the storage market determines the possibility for the action to be taken to ensure a level of storage use is met for the purpose of SoS. Any possible intervention should fit in the concept of improving security of supply in the EU which is set out in the Regulation 994/2010. This includes also the idea of developing a more regional flexibility market, also using storage capacity in neighbouring countries.

Next steps

During the 24th Madrid Forum, the Forum noted the need for a strategic discussion on both storage and LNG. CEER, GSE and GLE respectively were invited to prepare such a discussion for the next Madrid Forum. CEER is of the opinion that this report can serve as a good starting point for a strategic discussion on storage. CEER will determine in close cooperation with GSE what the precise goal of this strategic discussion will be.

The final report will be presented to the Gas Coordination Group and the Madrid Forum in 2014.

¹⁸ In this respect, CEER points out that the discussion on capacity markets in electricity is creating uncertainty and impacting any investment decisions (in turn disturbing the market).

¹⁹ In this respect, CEER considers that the repercussions of a lower storage use on security of supply in the different Member States should depend on their diversity of supply and flexibility sources. Improved flexibility in the network system, using storage in neighbouring countries and diversified supply could also perform the function of storing gas, also including the task of securing supply and should be taking into account first.



Annex 1 – CEER

The Council of European Energy Regulators (CEER) is the voice of Europe's national regulators of electricity and gas at EU and international level. Through CEER, a not-for-profit association, the national regulators cooperate and exchange best practice. A key objective of CEER is to facilitate the creation of a single, competitive, efficient and sustainable EU internal energy market that works in the public interest.

CEER works closely with (and supports) the Agency for the Cooperation of Energy Regulators (ACER). ACER, which has its seat in Ljubljana, is an EU Agency with its own staff and resources. CEER, based in Brussels, deals with many complementary (and not overlapping) issues to ACER's work such as international issues, smart grids, sustainability and customer issues.

The work of CEER is structured according to a number of working groups and task forces, composed of staff members of the national energy regulatory authorities, and supported by the CEER Secretariat.

This report was prepared by the Gas Storage Task Force of CEER's Gas Working Group.



Annex 2 – List of abbreviations

Term	Definition
CEER	Council of European Energy Regulators
EFET	The European Federation of Energy Traders
FID	Final Investment Decision
GLE	Gas LNG Europe
GSE	Gas Storage Europe
OGP	International Oil and Gas Producers Association
NRA	National Regulatory Authority
rTPA	Regulated Third Party Access
SoS	Security of Supply
SSO	Storage System Operator
TSO	Transmission System Operator



Annex 3 – Overview of national storage obligations

- *Hungary*: a storage obligation is prescribed by the Government decree No. 48/2010. Suppliers to household customers need a universal supplier licensee. This licence contains an obligation to store 60% of its customers' previous winter period gas consumption in any underground storage in Hungary. The total amount of this obligation was 1.8 bcm in the 2012/2013 winter. 1.41 bcm were used from this storage volume in the winter 2012/2013. Traders have to define their withdrawal plan.
- *France*: in France, the Ministry for Energy is responsible for storage, not the NRA. Each year, a Ministerial Order defines consumption profiles which are then used to calculate the storage rights associated with end-consumers (domestic consumers, consumers providing services of general interest and other non-domestic consumers). The total storage capacity rights to which each shipper is eligible are calculated by adding all storage rights associated with all end-consumers supplied by this shipper. This storage rights "envelope" is allocated on 1st April.

Adjustments to the allocated rights are performed on 1st July and 1st November to take into account the changes that may have occurred in each shipper's portfolio. As a complement to this allocation process, the Decree No. 2006-1034 places on active suppliers the obligation to have in stock, on 1st November each year, at least 85% of the capacities rights associated to their domestic customers and customers providing services of general interest (for example, hospitals, schools).

Last winter (2012-2013), shippers have booked 100% of the storage capacity necessary to meet their storage obligations as of 1st November. These bookings corresponded to 50% of the total storage capacity bookings. Considering the very low level of gas in storage facilities at the end of winter 2012-2013, it can be concluded that these storage capacities corresponding to the storage obligations have been fully used.

- *Slovakia*: shippers are supposed to fulfil the obligation of the security of supply standard. This statement means that they have to prove that they keep at least 20% of their security of supply standard as a capacity in the gas storage facility in the EU. The Energy regulatory office is preparing steps towards shippers and will alert all relevant shippers about this duty. In next phase, the regulator is ready to control fulfilment of this duty and penalise violation of this statement.
- *Spain*: according to Article 10 of the Ministerial Order ITC/3128/2011, shippers must keep stored in the underground storages, at least, 20 days of their firm sales in the previous year. The storage gas for this purpose was not used during the winter 2012-2013.
- *Portugal*: the Regulation No. 994/2010 was transposed to national law by Decreto-Lei No. 231/2012, 26th October - "protected costumers" definition: Regarding PSO all NG market retailers must have and maintain security of supply reserves for (i) all NG domestic consumers connected to the distribution network, (ii) for protected costumers defined in point (a) of No.1, Article 2 of Reg. No. 994/2010 (iii) and to all ordinary electricity producers not interruptible.



The quantity of SoS reserves are defined by the national government and must be such, regarding minimum gas-in-store, as to ensure all the supply demands listed in Article 8 of Reg. No. 994/2010. These obligations were not used during the last winter.

It is defined in national law (Decreto-Lei No. 231/2012) that the SoS reserves must be kept in storage facilities located in national territory near the main areas of consumption or located out from national territory under authorisation of the government, in coordination with the Transmission System Operator (TSO). Therefore, the Portuguese SoS reserves are considered at the underground storage facilities, at the LNG Terminal Storage and at LNG Carriers, already in transit, that are at a 3 days range from the Portuguese LNG terminal. The infrastructure line pack is not considered as a SoS reserve.

- *Belgium*: suppliers nor shippers are obliged to book storage capacity. However, storage in Belgium is an activity regulated under Regulated Third Party Access (rTPA). Parties who have booked storage capacity in the country (at the only storage facility available) are obliged to fill the volume which was allocated to them to at least 90% by 1st November of the next gas year, and to keep the storage level to at least 30% on 15th February of the same gas year.



Annex 4 – CEER questionnaire

Questions asked to both storage users and storage operators

1. What do you consider to be the most important reason(s) that shippers currently book storage capacity?

Please provide an explanation for each reason you consider to be valid.

2. What do you consider to be the most important reason(s) why shippers have either booked less storage capacity and/or did not fully used their booked storage capacity during the storage season 2012/2013 compared to previous years?

In answering this question, please take into account – if applicable – at least the following possible explanations:

- Current summer/ winter spread;
- Tariff related issues (transmission cost of accessing storage);
- Regulatory related issues (e.g. TPA rules in national codes); and/or
- Grid restrictions (temperature dependent capacity, firm capacity).

3. To what extent do you consider that shippers' booking behaviour during the last storage season is only temporary (e.g. spread related) or more permanent?
4. If you consider that shippers' booking behaviour is changing more permanent: what role will storage play in shippers' activities and how will this affect the storage market overall?
5. When comparing shippers' booking behaviour in Europe, to what extent do you consider this behaviour to be dependent on national storage rules that apply?
6. If you consider that shippers' booking behaviour is dependent on national storage rules: what rules do you consider have the most impact?

In answering this question, please take into account – if applicable – at least the following possible explanations:

- Applicable regulatory framework (e.g. applicable TPA regime); and/or
- Rules on how storage is used (SoS obligations, strategic reserves).

7. Are there any other issues that CEER should take into account that have not been addressed in this questionnaire?



Questions asked specifically to storage operators

1. In comparison with previous year(s), to what extent did shippers book less storage capacity during the last storage season (and by how much)?
2. Taking into account current storage capacity bookings and injection levels, to what extent do you consider that storage throughout Europe will be sufficiently filled on 1 October?