

Study on the impact of the measures included in the EU and National Gas Storage Regulations for the European Union Agency for the Cooperation of Energy Regulators



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Study on the impact of the measures included in the EU and National Gas Storage Regulations

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For:

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Abbreviations

ACER	European Union Agency for the Cooperation of Energy Regulators
AGGM	Austrian Gas Grid Management
AGSI	Aggregated Gas Storage Inventory (Link)
ASGM	Austrian Strategic Gas Storage Management
ASMR	Administration of State Material Reserves
CAPEX	Capital Expenditures
CEER	Council of European Energy Regulators
CfD	Contract for Difference
DSO	Distribution System Operator
EBRD	European Bank for Reconstruction and Development
EC	European Commission
EEX	European Energy Exchange
EU	European Union
FSRU	Floating Storage and Regasification Unit
GIE	Gas Infrastructure Europe
GIS	Gas in Storage
GME	Gestore dei mercati Energetici
GSE	Gestore dei Servizi Energetici
GWV	Gas Working Volume
HUSA	Hungarian Hydrocarbon Stockpiling Association
IP	Interconnection point
LNG	Liquefied Natural Gas
MS	Member State
NRA	National Regulatory Authority
OPEX	Operating Expenditures
PSV	Punto di Scambio Virtuale
SBU	Standard Business Unit
SSBO	Strategic Storage-Based Options
SSO	Storage System Operator
THE	Trading Hub Europe
TPA	Third Party Access
TSO	Transmission System Operator
UGS	Underground Gas Storage
UIOLI	Use-It-Or-Lose-It
VAT	Value Added Tax
VGS	Virtual Underground Storage
WACC	Weighted Average Cost of Capital

Executive Summary

The role of gas storage in the aftermath of Russia's invasion of Ukraine

Gas storages play an important role in the European gas system as they supply up to 25-30% of the total gas consumed in the Union during winter thereby balancing peak demand. Storing gas physically in the Union during summer helps to mitigate the impact of a potential gas disruption in a context where the EU's indigenous gas production is consistently declining, whilst EU's gas import dependency from external gas producers increases and the Union is dealing with the challenge of phasing out the dependency from Russian gas supply.

Underground gas storage offers two types of added value to the gas system. The **market value** reflects the opportunities offered to market participants to take advantage of short-term or seasonal price spreads. The **system value** represents mainly security of supply aspects which are directly connected with the cost of a disruption of gas supply and the optimisation of network system costs. The market value of storage depends on market signals and is not driven by the need to increase the system value, i.e., to maintain adequate levels of security of gas supply and optimise network costs. For example, negative summer-winter price spreads discourage market participants from injecting gas into storages during summer to be withdrawn during winter. This poses a risk to the security of gas supply as storage levels may not sufficiently address future supply-demand imbalances. In such cases, **administrative measures may be required to ensure that gas storages are filled, regardless of unfavourable market signals for market participants.**

In late 2021, as a consequence of increasing wholesale gas prices and Gazprom Export's strategy that left the Gazprom-owned storages at low storage levels, European gas storage levels reached record low levels and could have been better prepared for the winter.¹ An energy crisis, following Russia's invasion of Ukraine in February 2022, led to **even higher gas price spikes and further concerns about gas supply availability** to meet peak demand in the winter 2022/2023.

These events emphasised the **necessity for adequately filled gas storages across Europe to increase the preparedness for potential gas supply disruptions.** However, the tight gas market in early 2022 and the possibilities of future price rallies and the increased price volatility during that summer showed that **market dynamics alone may not be sufficient to keep an adequate amount of gas in storage for the next winter.** The prospect of low storage levels for a second consecutive year posed a significant risk for security of energy supply in the European Union. To address this situation, the EU adopted the **Gas Storage Regulation** ([Regulation \(EU\) 2022/1032](#)) in June 2022, amending the Security of Supply Regulation ([Regulation \(EU\) 2017/1938](#)). This Regulation emphasized the value of **underground storage in ensuring security of gas supply.** The Gas Storage Regulation mandated Member States to fill storage facilities to at least 80% of their capacity² by November 1st, 2022, and up to 90% by November 1st in subsequent years until 2025. The Regulation offers Member States flexibility to choose, among a range of measures, those which are deemed more appropriate for their

¹ EC, April 2022, [Quarterly market reports highlight unprecedented gas and power prices in the EU in Q4 2021](#)

² For Member States with large storage capacity compared to their typical annual consumption, the filling target is adjusted to 35% of their capacity. The Member States meeting this condition are Austria, Hungary, Latvia, the Netherlands and Slovakia. In Austria and the Netherlands national targets have been set, to enhance the use of storages for security of supply. These targets require 90% of capacity to be filled by November 1st, 2022.

national systems, and where possible, to adopt market-based measures in order to meet their filling targets.

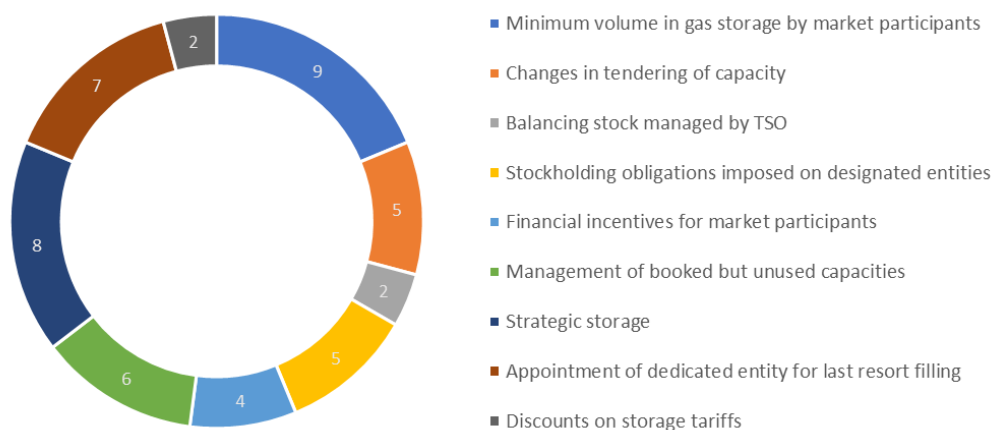
So far, all Member States with underground gas storage facilities have met the obligations set in the Gas Storage Regulation for 2022 and 2023³. On November 1st, 2022, the aggregated storage filling level in Europe reached 95%⁴, exceeding the 80% filling target. **Measures implemented by Member States helped to overcome negative market signals during the 2022 injection period** and achieved storage levels similar to those in the 2017 – 2020 period. ACER Market Monitoring report for 2023 examines the drivers for price spikes during the 2022 injection (summer) period and their dynamics.

Inventory and assessment of measures adopted by Member States

This Study aims to analyse the measures adopted by the Member States to strengthen the use of underground storage facilities in the EU and their contribution to the objectives of the Gas Storage Regulation. This study is largely based on information collected from national regulatory authorities (NRAs) and complemented with publicly available information.

Most Member States have **put in place measures requiring entities to establish gas stocks** (Figure 1). These measures include setting minimum gas stockholding obligations on market participants, establishing strategic stocks, and designating entities to provide a last resort service for storage. **Other measures aim at incentivising or facilitating the booking and utilisation of storage capacity:** changes in gas capacity tendering procedures (e.g., more frequent capacity auctions), financial incentives and subsidies, zero-reserve prices for storage capacity in auctions, and use-it-or-lose-it (UIOLI) congestion mechanisms which aim to release booked but unused storage capacities.

Figure 1: Types of measures applied by Member States with underground storage facilities

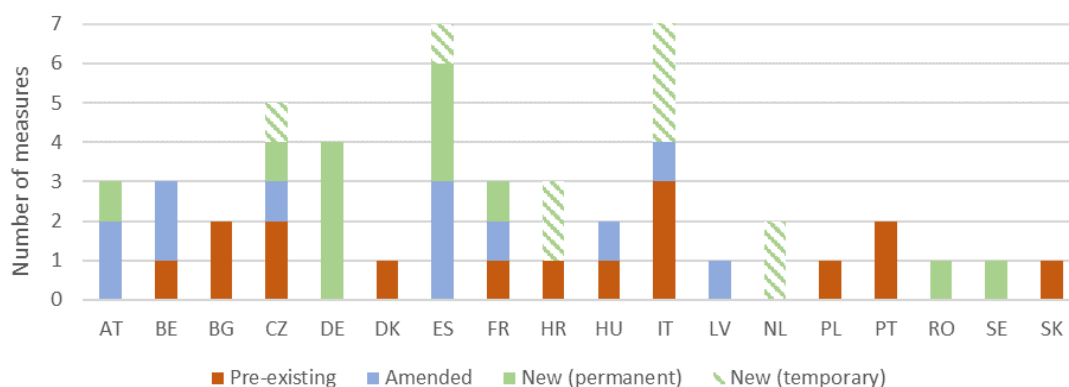


Some Member States **continued applying measures that existed before the Gas Storage Regulation**. Other Member States have **amended the existing measures and/or adopted new measures in 2022** (Figure 2), of which many are temporary and related to the challenging market conditions from 2022-2024.

³ [Commission Implementing Regulation \(EU\) 2022/2301](#) sets the filling trajectories and targets for 2023.

⁴ Source: GIE.

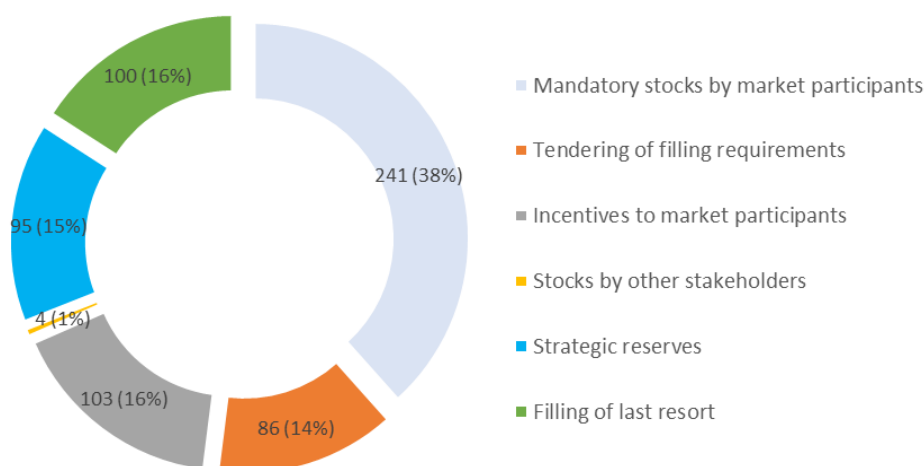
Figure 2: Number of pre-existing, amended and new measures per Member State



The role of different stakeholders in establishing gas stocks varies among Member States. **Market participants may be required to establish mandatory gas stocks or to voluntarily store gas in response to market signals, incentives provided** through subsidy mechanisms and tariff discounts. **In situations where there is insufficient market interest** in filling storage facilities, entities other than market participants, such as market operators, TSOs (Transmission System Operators), SSOs (Storage System Operators), and State Agencies, may be mandated to fill a portion of the storage or provide services for storage filling of last resort.

In 2022, as a result of the measures, Member States’ underground facilities collectively stored **over 630 TWh of gas** (Figure 3). This amount represents approximately 53% of the total aggregated storage capacity in the EU. Notably, close to 40% (i.e., 241 TWh) of these volumes are filled thanks to the mandatory stock obligations imposed on market participants, while 100 TWh were procured for storage filling of last resort in Member States where storage filling by suppliers was not obligatory, and market participants had little interest or incentive to store gas. It is worth mentioning that Figure 3 below does not account for measures that indirectly did impact storage filling, such as the application of UIOLI mechanisms⁵.

Figure 3: Gas volumes stored as a result of measures in 2022

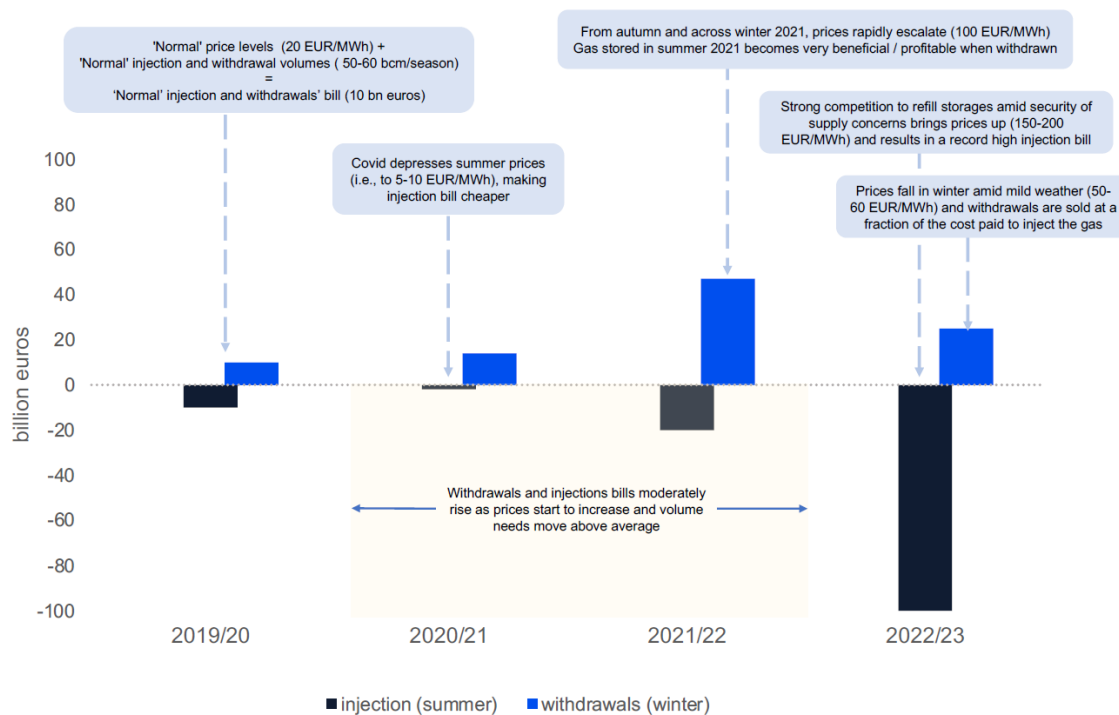


⁵ These use-it-or-lose-it (UIOLI) mechanisms led to the release of 25 TWh of storage capacity, with the majority of this capacity being booked by Gazprom. Other market participants then utilized this capacity to fulfil their storage filling obligations.

Despite limited information regarding actual implementation costs of the measures in 2022, examples from Germany and Denmark include spendings of around **885 million €** (of which 95% carried by Germany) for the procurement of **services for gas storage filling through public tenders** which secured around 85 TWh of gas in storage. This cost concerns only the fee paid to the providers of the filling service, for keeping gas in storage on specific dates, and does not include the spendings of these service providers for procuring the gas volumes to be stored.

Establishment of strategic reserves in Austria and the procurement of gas as a last resort in Germany and Italy, which placed a total of 105 TWh in the storages of these three countries, cost around **19 billion €**. **This substantial cost was due to the high prices of gas, ranging between 175 and 200 €/MWh**, during the third quarter of 2022. It is important to mention that these figures account for the cost of gas procured. Calculation of the measure's actual cost should consider the revenues from selling the stored gas quantities back to the market. However, it is expected that **only a portion of these costs can be recovered from the market**. This expectation is based on the gradually decreasing gas prices following the peak in August 2022, after which prices dropped and remained below 70 €/MWh since the beginning of 2023. As shown in Figure 4, which represents the highest range estimate, the combination of a high prices and above average injection volumes resulted in very high gas storage injection costs during the summer of 2022.

Figure 4: Cost of gas storage withdrawal and injections (Source: ACER Market Monitoring Report 2023)



The Gas Storage Regulation stipulates that national measures, aimed to ensure adequate storage filling levels, must align with the framework of the European internal energy market. These **national measures should be transparent, non-discriminatory**, and avoid **adverse effects** on the functioning of the gas markets and the security of supply in other Member States. The Study assessed qualitatively the contribution of the measures implemented by the Member States to the objectives of the Gas Storage Regulation. The key findings are summarized in the Table below.

Table 1: Key findings of qualitative assessment of measures undertaken by Member States

Criterion	Key findings
Clarity, verifiability, and transparency	<ul style="list-style-type: none"> ▪ Measures are described in the legal and regulatory framework with sufficient clarity, defining the obligations of each entity, the monitoring responsibilities, cost recovery mechanisms and incentives. ▪ All Member States monitor the implementation of the measures. ▪ The transparency of the measures' outcomes is not always ensured. In 6 out of the 9 Member States assigning stockholding to market participants, the obligations of the market participants are not published. In these cases, it is not possible to verify the outcomes of the implementation.
Non-discrimination	<ul style="list-style-type: none"> ▪ Obligations are typically allocated pro-rata to the different parties based on parameters such as gas sales or booked capacity. Only 12 Member States, the responsibilities are assigned to a single market participant (state-owned supplier or universal service provider). ▪ Costs for implementing the measures are usually recovered from gas consumers or all energy consumers. In 10% of the measures, however, costs are allocated to specific customer groups or to non-domestic gas consumers. ▪ The entities are free to withdraw gas, as long as the entities meet their respective filling targets.
Contribution to security of supply	<ul style="list-style-type: none"> ▪ Measures imposing stockholding obligations to suppliers and other stakeholders contributed to the largest part in terms of storage filling, around 40% of the total volumes stored. ▪ Storage filling of last resort was triggered only in 4 Member States, but its contribution was essential for ensuring that the storages are full from the beginning of the winter. ▪ In 4 out of the 8 Member States having established strategic reserves, the impact is limited, as they accounted for less than 10% of the countries' storage capacity. ▪ The impact of the UIOLI mechanism is considerable, as its application released unused capacity for storage filling.
Cost recovery options	<ul style="list-style-type: none"> ▪ Entities other than market participants (market operators, TSOs, SSOs, State agencies, etc.) are fully reimbursed for all the expenses incurred to implement the measures, through tariffs, levies or State financing. ▪ Where suppliers are obligated to establish gas stocks, no administrative cost recovery mechanism is in place. The suppliers passing these costs to their customers carry the potential risk of being unable to collect in full the necessary funds to cover these costs. ▪ Incentive and penalty mechanisms were/are in place mainly for market participants with storage filling responsibilities
Effects on gas market	<ul style="list-style-type: none"> ▪ Obligations set on market participants can affect market functioning, potentially leading to increased retail prices. Suppliers' costs for filling storages comprise of the costs of booking short-term storage capacity and procuring gas, even at high prices, to meet the storing filling obligations. ▪ Congestion at the storage facilities was observed only in few cases, where the capacity of the facilities was insufficient to match the market interest. ▪ Wholesale gas prices can be impacted by multiple factors, making it difficult to establish a direct cause-and-effect link between the implementation of measures and their impact on the gas market. However, some of the measures implemented during the summer 2022 may have contributed to push wholesale gas prices to

high-records in 2022, although it is difficult to assess to what extent. This price surge was driven by the intensification of intra-EU price competition for short-term gas procurement at EU hubs, followed by gas injection into storages. It is important to extract lessons learned from this experience. More specifically, in Germany and Italy, where **storage filling of last resort** was necessary, the **gas stocks should be released back to the market using mechanisms that do not increase wholesale prices.**

The Study also examines the measures implemented by **the Member States without underground storage facilities**. In most of these countries, **obligations were assigned to market participants**. Some Member States faced difficulties in meeting their targets; in Greece and Slovenia, storing gas in neighbouring countries was hindered by constraints in the availability of interconnection and storage capacity, while Estonia faced difficulties to establish strategic gas reserves.

Key findings and next steps

The analysis performed in the Study leads to the following key conclusions:

- **Financial incentives for storage users.** On the one hand, offering financial incentives to storage users facilitated the utilisation of storage capacity. It appears that **incentives such as tariff discounts and direct subsidies have proved to be effective**. On the other hand, the **interest** of market participants in taking part in more elaborate incentive schemes, such as **signing contracts for differences⁶, was limited**.
- **Use-it-or-lose-it mechanisms** enabled the swift release of booked but unused capacity and **contributed considerably to storage filling**. These mechanisms are essential for ensuring that storage capacity is fully utilised.
- **Effectiveness and use of storage measures.** On the one hand, the **introduction of specific stockholding obligations to market participants connects to weak market signals**. In years when, due to unusual market conditions, summer gas price is significantly higher than future winter contracts (as in 2022, when negative summer-winter spreads across the injection season reached -20 €/MWh⁷), imposing responsibilities to gas suppliers (backed by financial incentives / disincentives) or other last resort entity provides confidence that the storing filling targets can be achieved. On the other hand, in periods when positive market price signals incentivise market participants to store gas, imposing stockholding obligations that account for the largest part of the storage capacity may reduce the flexibility of the gas system. In this case, retail prices could also be impacted, as suppliers may be burdened with additional storage charges, and their procurement of gas maybe driven, to an extent, by the need to meet the filling targets and not by the market signals themselves.
- **Importance of last resort storage entity.** Regardless of whether market participants undertake a mandatory or voluntary role in storage filling, the **appointment of an entity to provide storage filling of last resort secures that storages will be adequately filled in case of**

⁶ In this context, contracts for differences (CfDs) refer to contracts signed between the storage user and another entity (usually the TSO), which pays the difference between the market price and a strike price defined in the contract. See [here](#) for further details on the application of CfDs as a measure.

⁷ Source: ACER Market Monitoring Report 2023.

unfavourable price market signals. This measure contributes to safeguard security of supply, in case the market would not act, but it comes at a cost. Drawing from the experience gained of implementing such mechanisms in 2022, a last resort mechanism should be made more efficient by ensuring **careful planning** of the conditions when the entity takes action, volume requirements, and introducing **risk reduction** mechanisms (e.g., price hedging by the designated entity) and a clear commercial **strategy that seamlessly interacts with existing market rules, including selling the stored gas back to the market without distorting wholesale prices.**

- **Transparency and verifiability of some measures should improve.** Whilst recognizing that reporting on stockholding obligations and performance assigned to market participants involves the use of commercially sensitive information like gas sales or booked capacity, as a regulatory minimum, the monitoring authority could publish information on the total obligations and gas stocks established by all market participants.
- **Challenges in Member States Without Underground Storage.** Member States without underground storage facilities had made efforts to store gas in neighbouring countries. **However, in some cases they faced capacity constraints and difficulties in accessing gas sources.** To increase the use of neighbouring storages these technical and commercial constraints will have to be addressed, especially by strengthening coordination between Member States with and without storage and finding ways in enhancing regional solidarity.

As a follow-up to this Study, the Council of European Energy Regulators (CEER) is planning a follow-up study. This CEER study will review agreements and burden-sharing mechanism between Member States that have storage facilities and the ones that do not have them, and identify best practices and propose recommendations to design storage filling obligations with the aim to enhance their effectiveness and efficiency.

1 Introduction

1.1 Objectives of the Study

The Gas Storage Regulation (Regulation (EU) 2022/1032⁸) entered into force in 2022, amending the Security of Supply Regulation (Regulation (EU) 2017/1938), and requires Member States to undertake measures to meet specific obligations for filling their underground gas storage facilities:

- Member States with storage facilities should ensure that they are filled up to at least 80% of their aggregated capacity by November 1st, 2022, and up to 90% of aggregated capacity by November 1st of each subsequent year. Intermediate targets are also set from February to October of each year. The filling obligation is capped to a volume corresponding to 35% of the average annual gas consumption of the respective Member State over the last five years.
- Member States without gas storage facilities are required to ensure that market participants have stored at least 15% of the average annual gas consumption over the preceding five years, in neighbouring gas storage facilities. Alternatively, these Member States may sign burden-sharing mechanism agreements with other countries, to meet their obligations.

Article 6b(1) of the Gas Storage Regulation lists a number of measures that Member States may adopt to fulfil their obligations. According to Article 6b(2), such measures should be “*clearly defined, transparent, proportionate, non-discriminatory and verifiable. They shall not unduly distort competition or the proper functioning of the internal market in gas or endanger the security of gas supply of other Member States or of the Union*”.

Member States have already taken measures, falling within the list of Article 6b(1), to meet the storage filling trajectories and targets of the Regulation⁹. These include measures that were already in place when the Gas Storage Regulation entered into force and continue to apply, with or without amendments, as well as new measures adopted in 2022.

The aim of this Study is to conduct a comprehensive evaluation of the measures that have been taken by the Member States, encompassing:

- Stocktaking and analyses of the measures taken.
- Analysis of the impact of adopted measures on the gas storage filling levels of Member States in 2022.
- Analysis of the financial costs associated with implementing the adopted measures.
- Assessment of the contribution of adopted measures on the objectives of the Gas Storage Regulation, based on criteria of transparency, non-discrimination, verifiability, contribution to security of supply, economic effectiveness and impact on the gas markets.

Additionally, the Study seeks to identify and highlight difficulties/risks concerning the implementation of the gas storage measures.

⁸ In this Study, Regulation (EU) 2022/1032 ([Link](#)) is referred to as “Gas Storage Regulation” or “Regulation” interchangeably

⁹ These are referred to as “measures” in the Study.

1.2 Overview of the Study

The Study comprised the four Tasks, the scope of which is described below.

Task 1 comprised a **stocktaking of the measures** adopted across Member States and provides necessary inputs for the implementation of the remaining Tasks of the Study. The source of information regarding the national measures implemented by each Member State was primarily the NRAs, on the basis of responses to structured questionnaires and one-to-one communications in certain cases. Additional information was collected, when necessary, through secondary desktop research, focusing on the national regulatory documents related to security of supply. Quantitative data (technical characteristics of storages, filling levels, tariffs, etc.) were also collected from the websites of the SSOs and GIE's AGSI+ database¹⁰. The stocktaking analysis performed under Task 1 is presented in Member States' country profiles in Annexes 2 and 3 of the Study, for Member States with and without storage facilities respectively.

Task 2 comprised a **qualitative assessment of each measure's contribution to the objectives of the Gas Storage Regulation**. Each measure taken in each Member State was examined qualitatively on the basis of the following criteria:

- Clarity, verifiability, and transparency of each measure
- Lack of discrimination in allocating obligations among involved entities and in allocating relevant costs among the energy consumers
- Contribution of each measure to security of supply
- Effectiveness of each measure's cost recovery mechanism
- Impact of each measure on the functioning of gas markets (storage, retail, wholesale)

Task 3 concerned the **identification of difficulties and risks encountered when implementing the measures**. The difficulties and risks identified include those highlighted by the NRAs, based on their experience and lessons learned, as well as those identified by the Consultant during the analysis of the measures.

Task 4 comprised a **quantitative analysis of how the measures implemented in each Member State contributed to storage filling in 2022, and at which cost**. The impact of each measure was analysed by examining its contribution to the gas stocks of the Member State, to the extent that sufficient evidence for measuring this was available. Costs for implementing the measures were also collected from the NRAs and through desktop analysis. In spite of information limitations, information where it was available has been used to analyse the costs of storage measures.

¹⁰ Data used from GIE's database were validated using SSO data where available, to ensure data consistency.

1.3 Structure of the Study

The Study is structured into 7 Sections, including this introduction.

[Section 2](#) describes the current role and value of gas storage in the EU for ensuring continuity of gas supply.

[Section 3](#) provides an overview of the measures applied in each Member State, and a brief description of each measure (mechanism of application and involved entities, recovery of costs, monitoring).

[Section 4](#) elaborates on the fulfilment of the Member States' obligations set by the Gas Storage Regulation and national targets assigned by the countries themselves, as well as the assessed contribution of specific measures adopted (to the extent that there is sufficient evidence).

[Section 5](#) concerns the assessment of the measures' contribution to the objectives of the Gas Storage Regulation.

[Section 6](#) describes the identified difficulties and risks encountered by Member States during the implementation of the measures.

[Section 7](#) provides the key findings and conclusions of the Study.

[Annex 1](#) presents the abbreviated titles used throughout the Study, corresponding to the types of measures listed in Article 6b(1) of the Gas Storage Regulation.

[Annex 2](#) provides the country profiles for the Member States with storage facilities.

[Annex 3](#) provides the country profiles for the Member States without storage facilities.

[Annex 4](#) contains the assessment performed for each measure taken by each Member State, together with the relevant justification.

2 Role and value of underground gas storage facilities

2.1 The market and system value of gas storage

Underground gas storages play a significant role in the energy sector. They contribute to a reliable gas supply and offer flexibility during the winter season, when gas demand is typically higher than gas imports. Storing gas during the summer season, physically in the Union, and using it during emergencies/the winter season, helps to mitigate the impact of a potential gas disruption, given the EU's gas import dependency from external gas producers. This is particularly important as the EU indigenous gas production consistently declines year-on-year.

According to CEER¹¹, gas storage has a market value and a system value:

- The **market value depends on the price signals** in the market. Prices reflect market participants' decisions, their hedging strategies, and their expectations on gas price evolution, which in turn shape short-term and seasonal price spreads. The market value is not necessarily aligned with a country's storage needs for security of supply purposes but is rather influenced by the **commercial use of storage** by the market participants.
- The **system value reflects security of supply aspects** that can be connected with the cost of disruption of gas supply. The system value provides a broader perspective than the market value, as it reflects the potential trade-off between paying for the cost of storage (collectively) against bearing the cost of a gas supply disruption. The system value may indicate the need for regulatory interventions in cases where the decisions of the market participants fail to ensure the appropriate storage filling levels, thus jeopardising security of supply. Regulatory action may also be called for, in cases where technical or other constraints prevent market participants from securing the amount of storage capacity needed to fulfil their operational needs.

Regulatory interventions, driven by the system value, may relate to:

- Third-party access (TAP) to the storage facilities, which is mandatory in the EU, and may take either the form of negotiated (n-TPA) or regulated (R-TPA) access, depending on the decisions of the pertinent national authorities.
- Design of products and tariffs for access to the storage (for R-TPA), driven by the system value of the storage.
- **Measures aiming to ensure the effective use of storages as a means to enhance security of supply.**

Bridging the gap between the market and system value of storage becomes of paramount importance when market signals are unfavourable. **Negative summer-winter price spreads discourage market participants** from injecting gas into storages during the summer. In such cases, **specific regulatory or other type of measures are necessary to create a safety net**, securing an adequate level of storage filling.

¹¹ CEER Report "Regulation of Long-Term Energy Storage from a Sector-Coupling Perspective: Lessons from gas storage", April 2022 ([Link](#)).

Such measures should exhibit certain characteristics so as to fit into the framework of the European internal market. They should be transparent, non-discriminatory, non-distortive to supplies from indigenous production and to cross-border flows and avoid having detrimental impacts on the functioning of the gas markets or to endanger the security of supply of other Member States.

Before the entry into force of the Gas Storage Regulation, some Member States had already in place regulatory interventions to guarantee certain volume of gas in storage (system value), while other Member States relied on the market itself to maintain adequate gas in storage. In an ACER report¹², several EU NRAs reported on the implementation of storage regulations entailing the following elements:

- **Market-based approach:** revenues of storage operators are given by the market valuation of storage products, determined by the seasonal and short-term price variability.
- **Revenue reconciliation:** storage operators receive additional revenues in cases where the difference between market revenues and regulated income is negative.
- **Storage obligations:** gas suppliers are obligated by regulation to keep a percentage of annual gas supplies in storage, thus guaranteeing more steady revenue streams for storage operators.
- **Strategic storage:** storage operators dedicate a certain share of storage capacity to strategic storage, which is not commercially available, socialising the respective costs among market participants.
- **Storage obligations for suppliers for strategic and operative reserves:** storage capacity is first allocated to storage users for meeting their stockholding obligations, and the remaining storage capacity is offered to the market.

2.2 The measures of the Gas Storage Regulation

The role of the underground gas storage facilities in the EU became more prominent in 2022, driven by the challenges encountered by the European energy markets to cope with the tight energy markets at the end of 2021 that escalated to an energy crisis after the Russian's invasion of Ukraine.

In late 2021, wholesale gas prices in Europe surged to record highs. A key contributing factor to this gas price rally was the significantly lower gas storage filling levels in the winter of 2021 compared to previous years. The average EU storage filling rate dropped from 75% at the end of September to just 53% at the end of December, the lowest storage filling level in a decade¹³.

Since early 2022, following Russia's invasion in Ukraine, the gas supply situation in the European gas markets became even more tight. This led to even higher gas price spikes and increased uncertainty over the availability of gas supplies to meet demand peaks, particularly during the winter. Europe became more reliant on liquified natural gas (LNG), which was the only feasible option for swiftly replacing Russian piped-gas supplies. Nevertheless, the global and volatile characteristics of the LNG market raised concerns about further gas price rallies and even the ability of market players to secure the supply of sufficient LNG shipments during the winter season.

¹² ACER "Report on Gas Storage Regulation and Indicators", April 2022 ([Link](#)).

¹³ EC, April 2022, [Quarterly market reports highlight unprecedented gas and power prices in the EU in Q4 2021](#)

The emergence of these issues emphasised the necessity for well-filled gas storages across Europe. **In the backdrop of very negative summer-winter price spreads, maintaining the system value of storage could only be achieved with measures, that either enforced or incentivised storage filling.** To ensure that storages are adequately filled at the beginning of winter, in June 2022 the European Commission proposed the Gas Storage Regulation, which amended the Security of Supply Regulation, setting specific filling trajectories and targets for the Member States until the end of 2025. The Gas Storage Regulation specified, inter alia, the type of measures that could be adopted by Member States to achieve these goals.

Following the entry into force of the Gas Storage Regulation, on November 1st, 2022, 94.9%¹⁴ of the European storage capacity was filled, a level that was well above the target of 80%, with all Member States achieving their target set by the Regulation. On December 31st, 2022, the filling level across the EU was still at 83.4%, and has since remained at high levels, compared to the past.

The contribution of the measures adopted in achieving high storage filling targets in 2022, during a period of unfavourable market signals, was undoubtedly significant. Nevertheless, as noted in the EC report on the implementation of the measures¹⁴, assessing the Gas Storage Regulation's impact on several aspects, including gas consumption (or gas savings), gas prices, storage injections and imports is challenging. Multiple factors, beyond the implemented measures, have influenced storage filling. Such factors include, inter alia, the specific circumstances of each Member State, price signals in different time horizons, gas demand and supply availability and market dynamics, and strategic decisions by market participants.

This Study attempts to assess the impact of the measures adopted by all Member States to reach their storage filling targets. Considering the difficulties and constraints in establishing conclusive evidence that links cause and effect, mainly due to the multi-interactive nature of the issue, this assessment is primarily qualitative. The contribution of individual national measures, on aspects such as storage filling, market competition and prices, is therefore assessed based on estimations, assumptions, lessons learned and observations of specific cases.

¹⁴ EC "Report from the Commission to the European Parliament and the Council on certain aspects concerning gas storage based on Regulation (EU) 2017/1938 of the European Parliament and of the Council", March 2023 ([Link](#)).

3 National measures on gas storage

3.1 Overview of measures on gas storage applied in the EU

The 18 Member States with underground storage facilities have applied several measures to meet the filling level trajectories and targets set by the Gas Storage Regulation. **These measures range with respect to typology, timing of introduction and duration:**

- The vast majority of the applied measures fall under one (or in few cases more) of the typologies defined under Article 6b(1) of the Gas Storage Regulation¹⁵.
- The timing of the introduction of measures varies. Some measures were already in place before the Gas Storage Regulation and continue to be in force as they were considered to be effective. Other measures were introduced prior to 2022 but were amended so as to fit the objectives of the Gas Storage Regulation. Finally, some measures were newly established in 2022, to contribute to the Regulation's targets.
- The duration of the measures differs, with some measures having a duration of 1 to 2 storage years (temporary), whilst others apply until the end of 2025 (end of the obligations set by the Gas Storage Regulation) and beyond (permanent).

To facilitate the analysis of the contribution of national measures to the objectives of the Gas Storage Regulation, the measures have been linked with the typologies outlined in Article 6b(1), based on information provided by the NRAs and on the Consultant's analysis of their objectives and scope. It is important to note that this categorization is somewhat different from the list of national measures presented in the European Commission's Staff Working Document of March 2023¹⁶. The variation mainly arises from the broad definition of the typologies listed in the Gas Storage Regulation, which result in national measures being relevant under two or more typologies.

In this Study, reference to the typologies of measures of Article 6b(1) of the Gas Storage Regulation is made using the abbreviated titles presented in Annex 1.

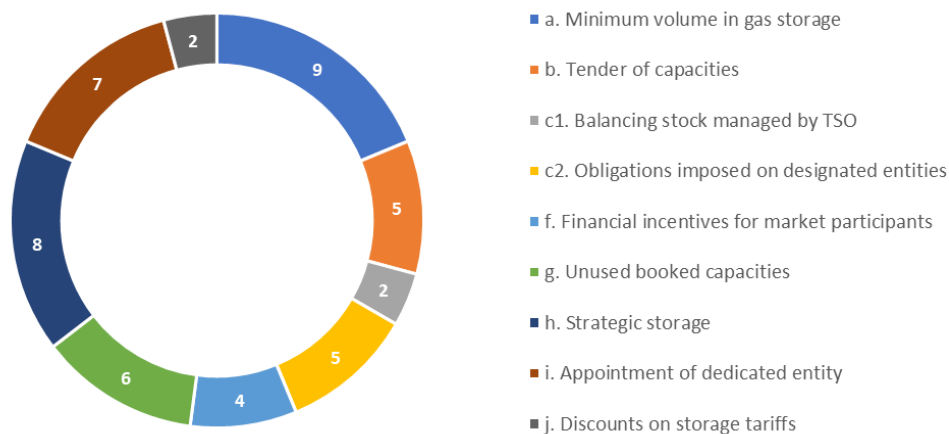
Although each of the Member States with storage facilities is using its own combination of measures, some measures are being applied more than others. **Stockholding obligations are assigned to market participants** in 9 out of the 18 Member States (measure (a) "Minimum volume in gas storage"). **Strategic storage reserves have been established** in 8 Member States (measure (h) "Strategic storage"). **A dedicated entity for storage filling of last resort has been appointed** by 7 Member States (measure (i) "appointment of dedicated entity"). The number of Member States implementing each typology of measures is shown in Figure 5.

¹⁵ It is noted that, the measure concerning the collection of revenues to recover the CAPEX and OPEX of regulated storage facilities (measure (k) of the Gas Storage Regulation) is examined in this Study as a compensation mechanism for other measures, and not as a separate measure by itself.

¹⁶ European Commission, March 2023, "Commission Staff Working Document Accompanying the document Report from the Commission to the European Parliament and the Council on certain aspects concerning gas storage based on Regulation (EU) 2017/1938 of the European Parliament and of the Council" ([Link](#))

Certain types of measures foreseen in the Gas Storage Regulation have not been adopted by Member States. Specifically, Member States have not established coordinated instruments for the purchase of LNG, and no voluntary joint gas procurement mechanisms have been put in place¹⁷.

Figure 5: Number of Member States with storage implementing each measure¹⁸



Member States also differ with respect to the use of measures that pre-existed the Gas Storage Regulation and the adoption of new measures, depending on how gas storages were used in each Member State for security of supply purposes:

- Germany, Netherlands, Romania, Latvia, Spain and Sweden rely on measures established or amended in 2022 as a result of the Gas Storage Regulation.
- Austria, Belgium, Czech Republic, Croatia, France, Hungary and Italy rely on a combination of measures put in place before and after the Gas Storage Regulation.
- Bulgaria, Denmark, Poland, Portugal and Slovakia rely only on measures put in place prior to the Gas Storage Regulation

In total, 22 out of the 48 measures were established in 2022 or 2023, as a result of the market conditions and the Gas Storage Regulation. Almost half (10) of these new measures are temporary, in place for the storage year 2022/23 and in some cases 2023/24. Of the remaining 26 measures that pre-existed the Regulation, 12 were amended in 2022, with the rest continuing to apply without changes.

An overview of the measures applied in each Member State with underground gas storage facilities is provided below, in Table 2.

In addition to the measures described above, in several Member States, discounts are provided to the entry/exit tariffs for transmission capacity to/from the storage facilities, in line with NC TAR, as incentives for market participants to book and use storage capacity. These additional measures are not analysed in the Study.

¹⁷ The measures that were not adopted required coordination between two or more Member States.

¹⁸ Source: Information from NRAs, analysed by VIS.

Table 2: Measures of Article 6b of the Gas Storage Regulation implemented per Member State with underground gas storage¹⁹

	a. Minimum volume in gas storage	b. Tender of capacities ²⁰	c1. Balancing stock managed by TSO	c2. Obligations imposed on designated entities	d. Coordinated instruments	e. Voluntary joint procurement mechanisms	f. Financial incentives for market participants	g. Unused booked capacities	h. Strategic storage	i. Appointment of dedicated entity	j. Discounts on storage tariffs	k. Capital and operational expenditures ²¹
AT	✓							✓	✓			
BE		✓						✓			✓	
BG	✓								✓			
CZ	✓			✓			✓(t)	✓	✓			
DE				✓				✓	✓	✓		
DK				✓								
ES	✓	✓					✓	✓	✓	✓	✓(t)	
FR		✓								✓		✓
HR	✓(t)		✓							✓(t)		
HU	✓								✓			
IT		✓	✓(t)	✓(t)			✓(t)	✓	✓	✓(t)		✓
LV									✓			
NL							✓(t)			✓(t)		
PL				✓								
PT	✓	✓										
RO	✓											
SE										✓		
SK	✓											

✓: New measure implemented due to the Gas Storage Regulation

✓: Existing measure amended as a result of the Gas Storage Regulation

✓: Measure in place prior to the Gas Storage Regulation

(t): Temporary measure (applied only in 2022/23 and/or 2023/24)

¹⁹ Source: VIS analysis based on responses from NRAs.

²⁰ Tendering of capacity existing before the Gas Storage Regulation in all the Member States implementing this measure.

²¹ In this Study, this measure is examined as part of the mechanisms applied to recover the costs of other measures, and not as a stand-alone measure.

Some of the Member States without underground gas storage facilities (Estonia, Finland, Greece and Lithuania) are implementing measures to utilise neighbouring storage facilities so as to enhance their security of supply²² (Table 3).

Table 3: Measures applied by Member States without underground gas storage

Member State	Measure implemented
Cyprus	Derogation from Articles 6a and 6d (Cyprus is not interconnected with another MS)
Estonia	<ul style="list-style-type: none"> ▪ Gas stocks by the TSO ▪ Strategic gas stocks
Finland	Mandatory gas stocks by market participants
Greece	Mandatory gas stocks by market participants
Ireland	Derogation from Articles 6a and 6d (Ireland is not interconnected with another MS)
Lithuania	Mandatory gas stocks by market participants
Luxemburg	2022: No specific measures set for the market participants Since 06/2023: Mandatory gas stocks by market participants
Malta	Derogation from Articles 6a and 6d (Malta is not interconnected with another MS)
Slovenia	No specific measures are set for the market participants

3.2 Application of measures on gas storage in each Member State

The Table below provides an overview of how the security of supply measures using storage facilities have been implemented in each Member State having underground gas storage facilities. This overview includes information on the timing of introduction of the measures and, where relevant, the duration of these measures. Each measure is linked to the respective typology defined in the Gas Storage Regulation. More details on the measures taken by each Member State with underground gas storage facilities are provided in the country profiles in Annex 2.

Table 4: Measures implemented per Member State with underground gas storage

Member State	Description of measures	Timing of introduction
Austria	Suppliers of protected customers are obligated to store gas to comply with the supply standard. Amendments of the measure in 2022 and 2023, expanded the definition of protected customers and established stricter control mechanisms. Suppliers recover their costs through the end-user prices charged to their customers. E-Control monitors implementation. <i>Minimum volume in gas storage – Point (a) of Article 6b(1)</i>	Existing measure amended in 2022 and 2023

²² Cyprus, Ireland and Malta have a derogation from applying Articles 6a and 6d of the Gas Storage Regulation, for as long as they are not interconnected with another Member State. Due to the derogation, these countries are not analysed in the Study.

	<p>The Austrian Strategic Gas Storage Management (ASGM) must establish and maintain a strategic gas reserve. ASGM conducted tenders for procuring gas quantities and storage capacities. The gas in storage can only be used for security of supply reasons upon order of the Ministry. ASGM must not gain or lose from implementing the measure, and its costs are covered from Federal Funds. Monitoring is carried out by E-Control together with the National Council and other stakeholders.</p> <p><i>Strategic storage – Point (h) of Article 6b(1)</i></p>	<p>New measure until the end of September 2025</p>
	<p>A UIOLI mechanism was introduced in 2022 for systematically unused storage capacity, that the SSO can release to the market (until then only a daily UIOLI on interruptible basis was in place). The SSO continues to receive the storage tariff from the user that lost its capacity, until this capacity is contracted by another user. E-Control monitors implementation.</p> <p><i>Unused booked capacities – Point (g) of Article 6b(1)</i></p>	<p>Existing measure amended in 2022</p>
Belgium	<p>The storage users that contract seasonal services have obligations to maintain specific levels of gas in storage at control points prescribed CREG (the filling trajectories for Belgium prescribed in the Gas Storage Regulation), including 90% on November 1st of each year. Amendments to the measure in 2022 introduced additional control points, as well as a stricter control and penalty mechanism. A penalty is imposed to storage users not meeting their filling targets (with a 5% tolerance), which corresponds to 10% of ZTP gas spot price for the volumes below the target. CREG monitors implementation.</p> <p><i>Tender of capacities – Point (b) of Article 6b(1)</i></p>	<p>Existing measure amended in 2022</p>
	<p>A UIOLI mechanism is in place if a storage user appears to be unable to reach its filling trajectory target based on its foreseen injection pattern. In this case, the Ministry of Economic Affairs - Department of Energy and CREG may decide that this capacity is released by the SSO to the market. The mechanism was revised in 2022, introducing additional check points for capacity utilization. The SSO continues to receive the storage tariff from the user that lost its capacity, until this capacity is contracted by another user.</p> <p><i>Unused booked capacities – Point (g) of Article 6b(1)</i></p>	<p>Existing measure amended in 2022</p>
	<p>Discounts apply to the storage capacity offered by the SSO in auctions, as the reserve price is set below the regulated price (taking into account the summer-winter spread), to incentivize market participants to use the storage capacity. Any potential deficit of the SSO, due to offering capacity below the regulated tariff, is covered by the regularization account.</p> <p><i>Discounts on storage tariffs – Point (j) of Article 6b(1)</i></p>	<p>Measure prior to Gas Storage Regulation</p>
Bulgaria	<p>Suppliers of final consumers with fluctuations in seasonal consumption and the district heating utilities must maintain a strategic reserve, between 10% and 20% of the relevant contracted annual quantities. The TSO, Bulgartransgaz must ensure availability of capacity for market</p>	<p>Measure prior to Gas Storage Regulation</p>

	<p>participants to meet their obligations. Suppliers recover their costs through the end-user prices charged to their customers.</p> <p><i>Minimum volume in gas storage – Point (a) of Article 6b(1)</i></p>	
	<p>Bulgartransgaz is obligated to maintain a strategic reserve related to the security of supplies and the seasonal fluctuation coverage, up to a maximum of 70 mcm, upon order by the Minister of Energy. Relevant costs by Bulgartransgaz are collected through the transmission tariff.</p> <p><i>Strategic storage – Point (h) of Article 6b(1)</i></p>	Measure prior to Gas Storage Regulation
	<p>Suppliers holding storage capacity have been assigned an obligation to keep in storage minimum gas quantities on August 1st (63%), October 1st (74%), and November 1st (90%), with tolerance up to 5%. The measure initially applied for storage year 2022/23 and then was extended for year 2023/24. As an incentive for storage filling, a discount is offered to the transmission tariffs to/from the storage facility (100% for the exit and 90% for the entry). In case storage users do not meet their targets, a UIOLI mechanism is applied, with unused capacity surrendered to HEP that must ensure that the filling targets are met. Suppliers recover their costs through the end-user prices charged to their customers. The Ministry of Economy and Sustainable Development monitors implementation.</p> <p><i>Minimum volume in gas storage – Point (a) of Article 6b(1)</i></p>	New measure for 2022/23, extended to 2023/24
Croatia	<p>HEP was obligated to establish during storage year 2022/23 a gas reserve of 270.8 mcm in the storage facility. The stored can be withdrawn in case of emergency, according to the intervention plan. The gas reserve must remain in storage in 2023, with HEP being able to sell the gas volumes to the protected customers during the 2023/24 heating season. Furthermore, in case market participants do not intend to use their storage capacity (and therefore do not meet their stockholding obligations), the capacity is surrendered by the user and assigned to HEP that must procure and store the respective gas quantities (acting as a storage filling of last resort). To cover its expenses, HEP was granted a loan with state guarantees. Additional funds could be made available from the State budget. The Ministry of Economy and Sustainable Development monitors implementation.</p> <p><i>Appointment of dedicated entity – Point (i) of Article 6b(1)</i></p>	New measure for 2022/23, extended to 2023/24
	<p>The TSO, Plinacro, is given the option to store gas in the storage facility, of up to 50 MWh, to be used for operational purposes of the transmission system. Plinacro recovers the costs for establishing and maintaining the stocks through the transmission tariffs. No monitoring is foreseen for this measure.</p> <p><i>Balancing stock managed by TSO – Point (c1) of Article 6b(1)</i></p>	Measure prior to Gas Storage Regulation
Czech Republic	<p>Storage users are obligated to maintain a minimum filling level, as share of their booked capacity, corresponding to the filling trajectories and targets set by the Gas Storage Regulation for the Czech Republic. In case</p>	New measure (introduced before the Gas

	<p>a user does not comply with these targets, the SSO releases its booked but unused capacity through a use-it-or-lose-it mechanism. The original capacity holder is obligated to pay the price for storage according to the contract with SSO. Storage users recover their costs through the end-user prices charged to their customers. ERÚ and Ministry of Industry and Trade (MIT) monitor implementation.</p> <p>The unused capacity which was “confiscated” is subsequently called the released capacity and is initially marketed at a zero and if there is no or limited market interest, then at negative reserve prices. Any revenue losses of the SSO due to the offered discounts are recovered from the State budget. MIT is primarily responsible for monitoring of unused capacities which market re- entry. Falls under ERÚ’s decree on Market Rules.</p> <p><i>Unused booked capacities – Point (g) of Article 6b(1)</i></p> <p><i>Obligations imposed on designated entities – Point (c2) of Article 6b(1)</i></p>	<p>Storage Regulation entered into force)</p> <p>New measure</p>
	<p>Contracts for differences (CfDs) were offered to storage users in the storage year 2022/23, to mitigate the impact of negative summer-winter spreads. The CfD was linked with obligation of the user to maintain certain levels of gas in storage between October 2022 and January 2023. CfDs were offered through auctions carried out by the TSO (NET4GAS) and the involved SSOs (RWE and MND). NET4GAS was responsible for payments to the storage users having signed CfDs and recovered its costs from the State budget. The Ministry of Industry and Trade monitored implementation, with ERÚ having a supporting role.</p> <p>As an additional measure, the Czech Government has agreed with ČEZ (supplier) to purchase gas from the Eemshaven LNG terminal (at which ČEZ has booked capacity of 3 bcm/yr), when market prices fall below a certain level. Details on implementation of this measure are not published. The Ministry monitors implementation.</p> <p><i>Financial incentives for market participants – Point (f) of Article 6b(1)</i></p>	<p>New measures (CfDs were in place only in 2022/23)</p>
	<p>The suppliers of protected customers are obligated to store gas in order to comply with the supply standard. The stored volumes correspond to 30% of their obligations to be maintained at storage facilities in the EU. Suppliers recover their costs through the end-user prices charged to their customers. ERÚ monitors implementation.</p> <p><i>Minimum volume in gas storage – Point (a) of Article 6b(1)</i></p>	<p>Measure prior to Gas Storage Regulation</p>
	<p>The Administration of State Material Reserves (ASMR) undertakes to establish and maintain gas reserves, upon decision of the Government. The stocks are used only following governmental approval. The SSOs must offer unused and uncontracted capacity to ASMR at zero price if needed by the Government. The costs incurred by ASMR are covered by the State budget. MIT monitors implementation.</p> <p><i>Strategic storage – Point (h) of Article 6b(1)</i></p>	<p>Measure prior to Gas Storage Regulation (amended in 2022 but not due to the Gas Storage Regulation)</p>

Denmark	<p>The TSO, Energinet, is responsible for ensuring the availability of gas supply in an emergency situation. Energinet may either procure storage capacity directly from the SSO (filled with corresponding purchased emergency gas) or procure filling requirements from market participants through public tenders. Energinet has the right to procure from the storage users offering filling requirement services, part or whole of their filling requirement. The level of emergency supply is determined by the Danish Energy Agency, but Energinet may choose to substitute between emergency gas and filling requirements. Energinet’s relevant costs are recovered through an emergency tariff applied to final consumers (tariff methodology is approved by DUR). The Danish Energy Agency monitors implementation.</p> <p><i>Obligations imposed on designated entities – Point (c2) of Article 6b(1)</i></p>	Measure prior to Gas Storage Regulation
France	<p>The mechanism for conducting storage capacity auctions, in place since 2018. This mechanism assigned to holders of storage capacity the obligation to fill at least 85% of their contracted capacity by November 1st. The mechanism was amended in 2022, to facilitate the participation of market participants in auctions (changes were made in the scheduling and frequency of auctions). Participation to the auctions is incentivised by setting a zero-reserve price. Any deficit in revenue-recovery of the SSO is recovered through the transmission tariffs (excluding cross-border points). CRE monitors implementation.</p> <p><i>Tender of capacities - Point (b) of Article 6b(1)</i></p> <p>Each SSO is responsible for procuring in the market and storing gas, to cover any gaps between the filling targets defined for its facilities and actual filling levels. The mechanism is triggered upon order by the Minister responsible for energy, as a last resort measure to meet the filling targets. The SSOs may mobilize the unused part of the capacity already booked by storage users in case the free storage capacity is not enough. The SSOs will subsequently sell the gas stocks to the market. Any costs incurred by the SSOs, and not recovered from selling the stocks, are compensated through the State budget. CRE monitors implementation.</p> <p><i>Appointment of dedicated entity – Point (i) of Article 6b(1)</i></p>	Existing measure partly amended in 2022 New measure
Germany	<p>The market area manager, Trading Hub Europe (THE), is responsible for ensuring that the national filling level obligations are achieved. THE can launch public tenders, open to the market area’s balancing group managers, to procure strategic storage-based options (SSBO products). The providers of the SSBO products must ensure that specific percentages of the contractually agreed gas quantities are stored at a defined storage facility on specific dates between October of a year and February of the next, including 100% of the contracted quantity on November 1st. THE may impose penalties (based on the contracted fees) to providers of SSBO products that do not meet their obligations. To recover its costs from procuring SSBO products, THE applies a neutrality charge, approved by BNetzA. The neutrality charge is applied on all</p>	New measure (up to 2025 with potential extension to 2027)

	<p>physical exit points, including cross-border IPs/VIPs. The Federal Ministry for Economic Affairs and Energy (BMWK) together with BNetzA monitor implementation.</p> <p><i>Obligations imposed on designated entities – Point (c2) of Article 6b(1)</i></p>	
	<p>In case capacity constraints at storage facilities do not allow THE to perform its security of supply activities, the respective SSOs must release to THE capacity booked but not used by storage users. In this case, the storage user continues to pay the SSO for the capacity except for variable injection and withdrawal fees. BMWK together with BNetzA monitor implementation.</p> <p><i>Unused booked capacities – Point (g) of Article 6b(1)</i></p>	New measure (up to 2025 with potential extension to 2027)
	<p>As part of the SSBO products procured by THE, the providers must maintain 20% of the contractually agreed gas quantities at the storage facility, to be available for THE to call-off at any time. THE may also draw on the quantities it has purchased and stored by itself. The decision to use the quantities is taken by the Federal Ministry for Economic Affairs and Energy in agreement with BNetzA. In case the call-off option is triggered, THE pays to the provided a charge that was determined in the respective SSBO tender. The costs incurred by THE in case the call-off option is exercised are covered through the neutrality charge. BMWK together with BNetzA monitor implementation.</p> <p><i>Strategic storage – Point (h) of Article 6b(1)</i></p>	New measure (up to 2025 with potential extension to 2027)
	<p>THE may purchase and inject in storage facilities its own gas volumes, to ensure that the filling targets are met, following approval by BMWK and agreement with BNetzA. THE must sell the gas stocks until the end of the storage year unless these volumes are considered necessary to meet the filling targets of the next year. The costs incurred by THE for procuring and storing are covered through the neutrality charge. BMWK together with BNetzA monitor implementation.</p> <p><i>Appointment of dedicated entity – Point (i) of Article 6b(1)</i></p>	New measure (up to 2025 with potential extension to 2027)
Hungary	<p>The Hungarian Hydrocarbon Stockpiling Association (HUSA) is responsible for establishing and maintaining security gas stocks and special gas stocks. The latter were introduced in 2022 with an amendment in the legislation. HUSA must ensure that the gas stocks, the level of which is determined by the Minister responsible for energy, are in storage during each year. HUSA recovers its costs through a security stockpiling fee paid by end-users excluding households. Implementation of this measure is monitored by an oversight committee comprising representatives of the Government, MEKH and hydrocarbon companies.</p> <p><i>Strategic storage - Point (h) of Article 6b(1)</i></p>	Existing measure amended in 2022
	<p>The universal supply provider (MVM Next Ltd.), selling gas under regulated conditions to households and microenterprises, is required to store gas until October each year, in order to partially cover consumption for the winter period. MVM's costs are recovered through the regulated</p>	Measure prior to Gas Storage Regulation

	<p>tariff for the universal supply service. MEKH monitors implementation and sets the level of the gas to be stored.</p> <p><i>Minimum volume in gas storage – Point (a) of Article 6b(1)</i></p>	
Italy	<p>To facilitate gas injection in the storages, the frequency of auctions for monthly storage capacity products was increased from April to October 2022. Additionally, as an incentive to book capacity, the reserve price for auctions was set to zero and part of SSOs operational costs are not charged to storage users for the thermal year 2022/23. The costs of the SSOs, including any loss of revenues due to the incentives related to storage charges, are compensated through the transmission tariffs charged to final consumers. ARERA monitors implementation of auctions, and the Ministry of the Environment and Energy Security monitors storage filling.</p> <p><i>Tender of capacities - Point (b) of Article 6b(1)</i></p>	Existing measure amended in 2022
	<p>Snam was tasked with procuring and injecting in storage the gas volumes required for the operation of the transmission system and the storage facilities for the period November 2022 – March 2023. The costs are recovered through the neutrality mechanism for the system balancing of the transmission system, paid by the Cassa per i Servizi Energetici e Ambientali (Cassa). ARERA monitors implementation.</p> <p><i>Balancing stock managed by TSO - Point (c1) of Article 6b(1)</i></p>	New measure for 2022/23
	<p>Snam and Gestore dei Servizi Energetici (GSE) undertook storage filling of last resort obligations, to ensure that sufficient gas is in storage during the winter period of 2022. For this measure a budget of up to 3.3 bil. € could be allocated to Snam by the Cassa, and up to 4 bil. € to GSE in the form of a zero-interest State loan (the allocated budget was not used in its entirety). Both Snam and GSE are to sell the procured gas to the market and return the revenues to the Cassa and the State, respectively (both Snam and GSE must be cost neutral from its activities. The Ministry and ARERA monitor implementation.</p> <p><i>Obligations imposed on designated entities - Point (c2) of Article 6b(1), and Appointment of dedicated entity - Point (i) of Article 6b(1)²³</i></p>	New measure for 2022/23
	<p>Financial incentives were also provided to storage users in 2022, to facilitate use of storage capacity:</p> <ul style="list-style-type: none"> ▪ Users are provided with a stock premium, paid by Snam, to ensure the required levels of storage filling in the end of October 2022. The premium is set up to a maximum of 5 €/MWh (depending on the summer-winter spread), based on the filling level of the user. ▪ The option to sign two-way contracts for differences with Snam was also offered to storage users. The CfDs are linked to obligations of the user to maintain a predefined level of gas stocks in storage, during the winter period of 2022/23. 	New measure for 2022/23

²³ The measure has been classified by the NRA, ARERA, under both measures of the Gas Storage Regulation.

	<ul style="list-style-type: none"> ▪ A penalty was applied to storage users that hold gas stocks below the minimum level assigned by the SSO in the end of October 2022. <p>To ensure that Snam is cost neutral from providing these incentives, its costs are covered by funds from the Cassa. ARERA is responsible for monitoring the provision of the incentives.</p> <p><i>Financial incentives for market participants - Point (f) of Article 6b(1)</i></p>	
	<p>Since the beginning of the 2000', the SSOs were obligated to establish and maintain strategic reserves in their storages, which can be used only in case of emergency, following order by the Ministry of the Environment and Energy Security. These reserves were established by the SSOs many years ago, therefore there are no additional costs incurred in 2022 due to this measure. The Ministry monitors implementation.</p> <p><i>Strategic storage - Point (h) of Article 6b(1)</i></p>	Measure prior to Gas Storage Regulation
Latvia	<p>State-owned Latvenergo is tasked with setting up this reserve in the Inčukalns UGS. This reserve cannot be sold, and can be used in case of a crisis, following a decision by the Cabinet of Ministers. The Cabinet of Ministers must reexamine the quantities of the safety reserves every 2 years. Latvenergo's costs are covered through the State budget. The Ministry of Climate and Energy is monitoring implementation.</p> <p><i>Strategic storage - Point (h) of Article 6b(1)</i></p>	Existing measure amended in 2022
Netherlands	<p>A subsidy scheme was established in 2022, to incentivise market participants to fill the Bergermeer storage facility, using both unbooked and already booked capacity. The subsidy is granted if the summer-winter spread is negative. To apply for the subsidy, storage users have to take part in a tender. Parties with direct or indirect Russian State interests (of over 50%), are explicitly excluded from the subsidy. To receive the grant, the storage users have to utilize their booked capacity up to a specified level on November 1st, 2022 (100%), and February 1st, 2023 (38%). The cost of the subsidy is covered from the State budget. Rijksdienst voor Ondernemend Nederland is responsible for monitoring implementation.</p> <p><i>Financial incentives for market participants – Point (f) of Article 6b(1)</i></p>	New measure (From 2022 to 2023)
	<p>Energie Beheer Nederland B.V. (EBN) was assigned in 2022 the responsibility of filling the underground storage facility of Bergermeer if this is not done by the storage users. The measure was extended further in 2023. Interruptible storage capacity must be used by EBN, as 40% of the capacity has been booked by Gazprom. The costs for implementing the measure are covered from the State budget. The Ministry of Economic Affairs and Climate Policy monitors implementation.</p> <p><i>Appointment of dedicated entity – Point (i) of Article 6b(1)</i></p>	New measure (From 2022 to 2024)
Poland	<p>All entities importing gas (suppliers, operators, final consumers) must maintain mandatory gas stocks throughout the gas year, corresponding to 30 days of their average daily net imports. The entities should ensure that the full quantity of the stocks can be made available over a period of</p>	Measure prior to Gas Storage Regulation

	<p>40 days. The stocks must be established primarily in storage facilities in Poland, and can be released by the TSO, following decision by the Minister responsible for energy. The entities recover their costs through their charges. ERO, the Minister responsible for energy and the TSO monitor implementation.</p> <p><i>Obligations imposed on designated entities - Point (c2) of Article 6b(1)</i></p>	
Portugal	<p>Suppliers of protected customers and non-interruptible supply to gas-fired power plants have been required to maintain security reserves of quantities equivalent to 45 days of the average annual consumption by protected customers, and 16 days of consumption corresponding to the maximum non-interruptible needs of combined cycle power plants. These reserves must be permanently available for use by the Directorate General for Energy and Geology and by the national TSO. Furthermore, since 2022, suppliers are also required to establish and maintain additional reserves, up to 700 GWh, only for the period from October to March. Suppliers recover their costs through the end-user prices charged to their customers. REN Gasodutos monitors implementation and notifies the Directorate-General for Energy and Geology and to ERSE of any situations of non-compliance.</p> <p><i>Minimum volume in gas storage – Point (a) of Article 6b(1)</i></p>	Measure prior to Gas Storage Regulation (amended in 2022 but not due to the Gas Storage Regulation)
	<p>Priority capacity booking is given to suppliers that have to establish reserves. Tenders take place at specific allocation windows exclusively for contracting storage capacity exclusively for the security and additional reserves. Standard capacity products (annual, quarterly or monthly) are offered in these tenders, at the standard reserve price of each product. REN Gasodutos monitors the tenders.</p> <p><i>Tender of capacities - Point (b) of Article 6b(1)</i></p>	Measure prior to Gas Storage Regulation (amended in 2022 but not due to the Gas Storage Regulation)
Romania	<p>Gas suppliers of final consumers and heat producers supplying households that buy gas directly from gas producers, are obligated to gradually establish gas stocks at the underground facilities until the end of October of each year. The stock quantities that the entities have to establish are the maximum between 90% of Romania’s storage capacity, and 30% of the gas consumption needs during the winter period. SSOs provide priority to the booking of capacity for the entities’ stockholding obligations. The entities recover their costs through the end-user prices charged to their customers. ANRE monitors implementation.</p> <p><i>Minimum volume in gas storage – Point (a) of Article 6b(1)</i></p>	New measure
Slovakia	<p>he DSO, gas suppliers and protected customers, which supply gas from EU Member States or third countries, must ensure the availability of sufficient gas every month of the period from November to March, to meet the average consumption of protected customers for the corresponding month. The Ministry of Economy decides if the gas volumes must be stored (and whether storage facilities in Slovakia or other countries will be used) or if the volumes need to be contractually</p>	Measure prior to Gas Storage Regulation

	<p>secured. The measure is considered as a public service obligation, and any net costs of the obligated entities can be claimed from the Ministry of Economy and covered through the State budget. The Ministry of Economy and URSO monitor implementation.</p> <p><i>Minimum volume in gas storage – Point (a) of Article 6b(1)</i></p>	
Spain	<p>Suppliers with firm sales in Spain (excluding wholesale trading and exports) and consumers, for the part of their consumption not supplied through suppliers, must establish and maintain in the underground facilities gas stocks at a minimum corresponding to 27.5 days of their sales or consumption of the previous year, of which 20 days (strategic stocks and operating stocks of the system) must remain in storage throughout the year and 7.5 days in place on November 1st of each year (operating stocks of the entity)²⁴. Suppliers recover their costs through the end-user prices charged to their customers. The Corporation for Strategic Reserves of Petroleum Products (CORES) monitors implementation.</p> <p><i>Minimum volume in gas storage – Point (a) of Article 6b(1)</i></p>	Existing measure amended in 2022
	<p>The storage capacity needed by entities with obligations to maintain gas stocks is allocated through an open subscription process. After the necessary capacity for gas stocks has been allocated, the remaining storage capacity is offered to users through auctions. To incentivise storage filling for commercial purposes, a discount is offered to all storage users, provided that 90% of the booked capacity is in storage on November 1st. Storage capacity allocation is monitored by CNMC.</p> <p><i>Tender of capacities - Point (b) of Article 6b(1)</i></p>	Existing measure amended in 2022
	<p>The loss of revenue resulting from discounts to storage tariffs is compensated by providing a credit to the Ministry through the State budget. Furthermore, the costs that the technical system manager, Enagás GTS, may undertake to supplement the gas stocks of an entity that are in breach of their obligations, by procuring gas and storing it on its behalf, are compensated directly by the said entity²⁵.</p> <p><i>Financial incentives for market participants – Point (f) of Article 6b(1)</i></p>	New measure
	<p>An oversubscription and buy-back (OSBB) mechanism has been put in place for the storage facilities, through which any booked but unused capacity of storage users is offered to the market as oversubscription. The costs and revenues of the OSBB are included in the storage tariff. CNMC monitors implementation of the mechanism.</p> <p><i>Unused booked capacities – Point (g) of Article 6b(1)</i></p>	New measure (2023)

²⁴ After 2022 the obligation is recalculated in a way to ensure that the filling level obligation in Spain, set by the Gas Storage Regulation, is met.

²⁵ As these mechanisms are used to cover the costs of Enagás GTS for its security of supply activities, they are analysed as part of the other measures and are not examined individually in the analysis.

	<p>The gas stocks of 20 days (out of the total of 27.5 days), established by gas suppliers with sales in Spain, and final consumers (in the part of their consumption that is not supplied through gas suppliers) concern strategic reserves. Out of these, 10 days are minimum strategic security stocks, to be utilized exclusively by the Government, and 10 days are minimum operating stocks of the system, to be utilized exclusively by the Ministry for the Ecological Transition and the Demographic Challenge. Suppliers recover their costs through the end-user prices charged to their customers. CORES monitors implementation.</p> <p><i>Strategic storage – Point (h) of Article 6b(1)</i></p>	Existing measure amended in 2022
	<p>Enagás GTS undertakes to cover the gas stocks' obligations of an entity, if the latter is in breach of its obligation to maintain gas stocks, following notification from CORES. Enagás GTS procures and stores gas on behalf of the entity. Enagás GTS is compensated directly by the entity through payment of imbalance charges. Enagás GTS reports periodically to CNMC and the Ministry on the actions taken under this measure.</p> <p><i>Appointment of dedicated entity – Point (i) of Article 6b(1)</i></p>	New measure (2023)
	<p>Discounts to the storage tariffs are offered for market participants that meet their obligation for minimum operating stocks (zero storage tariff) and for storage users that procured capacity via auctions and filled 90% of their booked capacity on November 1st (zero reserve price plus any premium from the auction). Any revenue deficit of Enagás GTS due to the offered discount is compensated through the credit provided to the Ministry for the Ecological Transition and the Demographic Challenge from State budget.</p> <p><i>Discounts on storage tariffs – Point (j) of Article 6b(1)</i></p>	New measure (From 2022 to 2024, with possibility to extend)
Sweden	<p>Since July 2023, Swedegas has been tasked with ensuring that filling levels at the storage facility are in line with the Gas Storage Regulation. To meet its obligation, Swedegas can assign balance administrators the responsibility to procure and store gas in the storage facility. This responsibility is allocated to each balance administrator on the basis of its market share. Costs for applying the measure are borne by the balance administrators. The Energy Markets Inspectorate monitors implementation.</p> <p><i>Appointment of dedicated entity – Point (i) of Article 6b(1)</i></p>	New measure (2023)

The Table below provides an overview of how each Member State without underground gas storage implements measures to utilize storage facilities of neighbouring countries. More details concerning the measures taken by each Member State without underground gas storage are provided in the country profiles in Annex 3.

Table 5: Measures implemented per Member State without underground gas storage

Member State	Description of measures	Timing of introduction
Estonia	Since 2022, the Estonian Stockpiling Agency (ESPA) has undertaken to stockpile natural gas and manage its use in case of emergencies. Release of the strategic stocks is decided by the Government. ESPA recovers its costs through payments from all final gas consumers (collected by the TSO, Elering and attributed to ESPA). The Ministry of Economy and Infrastructure monitors implementation.	New measure
	The TSO, Elering, is assigned with the responsibility to establish and maintain the stocks necessary to supply gas to protected customers. The gas stocks are released in case of an emergency, upon decision by Elering. The gas stocks released are sold to suppliers, which in turn sell them to their protected customers. The price at which the stocks are sold corresponds to their weighted average price, inclusive of network costs. The Estonian Competition Authority monitors implementation.	Measure prior to Gas Storage Regulation
Finland	The obligation to maintain gas stocks is assigned to market participants (gas suppliers, final consumers connected to the transmission system, power producers using LNG and providers of CNG/LNG for transport). The stocks include mandatory stocks, corresponding to the entity's quarterly gas sales / consumption, and additional storage obligations, which are necessary to meet the obligation set for Finland by the Gas Storage Regulation. Each entity recovers its costs from its customers. The National Emergency Supply Agency (NESA) monitors implementation.	Existing measure amended in 2022 (in place until 2025)
Greece	Suppliers that have imported more than 1% of gas imports must establish and maintain gas stocks in the Italian storage facilities before November 1 st . The total stocks established are equivalent to the maximum gas volumes that can be transported from Italy to Greece during the withdrawal period. The suppliers are compensated by the TSO, DESFA, that in turn recovers these costs from a security supply levy imposed on final consumers. The suppliers may also opt to sign a two-way contract for differences with DESFA, to cover the costs of negative summer-winter spreads. DESFA and RAE are responsible for monitoring implementation.	New measure
Lithuania	Gas suppliers selling gas to protected customers and gas-fired electricity producers that cannot use alternative fuels are responsible for establishing stocks, based on their gas sales/needs. The stocks may be stored at underground storages of MSs interconnected with Lithuania and can be used in case of emergency situations. The Ministry of Energy monitors implementation.	Measure prior to Gas Storage Regulation
Luxembourg	Suppliers must establish gas stocks in underground gas storage facilities of EU Member States, by November 1 st of each year. The stocks must be at least 15% of the supplier's gas sales in Luxembourg. Each supplier must recover its costs from its final consumers. The Ministry of Energy & Spatial Planning monitors implementation.	New measure (2023)

Slovenia

There are no measures setting requirements to market participants. Fulfilment of the targets relies on the market-based arrangements of the Slovenian market participants with their suppliers, and the SSOs of the neighbouring countries.

4 Fulfilment of the gas storage filling targets

4.1 Compliance with EC and national filling targets

All Member States with underground gas storage facilities have met the obligations for 2022 set in Regulation (EU) 2022/1032, and for 2023 (analysis until July 2023) in the Commission Implementing Regulation (EU) 2022/2301. Table 6 presents the target and actual filling levels of gas storages in each Member State, for the milestones foreseen in the Regulation.

Table 6: Fulfilment of Gas Storage Regulation obligations in Member States with storage for 2022 and 2023²⁶

	Art ²⁷ 6a(2)	1 Aug. 2022		1 Sep. 2022		1 Oct. 2022		1 Nov. 2022		1 Feb. 2023		1 May 2023		1 Jul. 2023	
		Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
AT	✓	49%	58%	60%	67%	70%	80%	80%	93%	49%	77%	37%	69%	52%	82%
BE		49%	76%	62%	89%	75%	100%	80%	100%	30%	69%	5%	48%	40%	84%
BG		49%	48%	61%	62%	75%	76%	80%	90%	45%	82%	29%	78%	49%	88%
CZ		60%	81%	67%	84%	74%	89%	80%	98%	45%	73%	25%	51%	30%	85%
DE		45%	69%	53%	85%	80%	92%	80%	99%	45%	78%	10%	67%	30%	81%
DK		61%	88%	68%	94%	74%	98%	80%	99%	45%	85%	40%	74%	60%	75%
ES		71%	78%	74%	85%	77%	90%	80%	95%	59%	90%	62%	90%	68%	98%
FR		52%	80%	65%	91%	72%	97%	80%	100%	41%	64%	7%	38%	35%	61%
HR		49%	54%	60%	78%	70%	91%	80%	97%	46%	85%	29%	73%	51%	92%
HU	✓	51%	55%	60%	66%	70%	76%	80%	88%	51%	59%	37%	47%	65%	67%
IT		58%	73%	66%	83%	73%	91%	80%	95%	45%	71%	36%	66%	54%	82%
LV ²⁸	✓	25%	48%	28%	50%	32%	53%	35%	58%	20%	44%	18%	40%	28%	62%
NL ²⁹	✓	54%	67%	62%	78%	71%	92%	80%	92%	31%	68%	25%	61%	41%	79%
PL		80%	99%	80%	99%	80%	98%	80%	99%	45%	85%	30%	51%	50%	71%
PT		72%	100%	75%	100%	77%	100%	80%	100%	70%	100%	70%	100%	80%	93%
RO		46%	59%	57%	74%	66%	86%	80%	97%	40%	63%	41%	47%	67%	68%
SE		40%	91%	53%	91%	67%	93%	80%	93%	45%	93%	5%	95%	5%	95%
SK	✓	49%	69%	60%	75%	70%	88%	80%	91%	45%	68%	25%	63%	27%	83%

Of the Member States having LNG storage capacity, in addition to underground facilities, only Spain has met the conditions laid down in Article 6a(5) of the Gas Storage Regulation (capacity of its LNG facilities as a share of the average annual gas consumption over the preceding five years exceeding 4%). It is nevertheless noted that the contribution of LNG storage to meet the filling trajectories and

²⁶ Source: GSE AGSI+ database, SSOs' websites

²⁷ This column indicates the Member States with large gas storage compared to their annual gas consumption, which fulfil the condition laid down in Article 6a(2) of the Gas Storage Regulation.

²⁸ Filling trajectories and target for Latvia have been adjusted as foreseen in the Gas Storage Regulation for Member States falling under Article 6a(2), i.e., pro rata calculation of targets by multiplying the value indicated in the table by the limit of 35 % and by dividing the result by 80 %.

²⁹ In the Netherlands the intermediate filling trajectory targets for the Netherlands have to be calculated on the basis of the provisions provided for in Article 6a(3) of the Gas Storage Regulation, due to the exports to the UK.

targets in Spain was very limited, as only ca. 100 GWh of LNG were stored as part of the implemented measures.

Austria, Belgium, the Czech Republic, Germany and France³⁰ have set national storage filling targets in their legislation, which are stricter than those in the Gas Storage Regulation. Most national targets are set for November 1st. In all these Member States the national targets for 2022 were fulfilled (Table 7).

Table 7: Fulfilment of national targets in Member States with storage in 2022³¹

	1 Oct. 2022		1 Nov. 2022	
	National target	Actual	National target	Actual
AT	-	80%	90%	93%
BE	-	100%	90%	100%
CZ	-	86%	90%	95%
DE	85%	92%	95%	99%
FR	-	97%	85%	100%

The majority of the Member States without underground gas storage succeeded in using the gas storage facilities in neighbouring Member States to meet their stockholding targets (Table 8).

Table 8: Fulfilment of Gas Storage Regulation obligations in Member States without storage in 2022

Member State	Obligation in 2022 (TWh) ³²	Actual stocks in 2022 (TWh)	Countries in which gas was stored
Estonia	0.75	1.1	Latvia
Finland	0.96 ³³	1.11	Latvia
Greece	1.14 ³⁴	1.14	Italy
Lithuania	1.5 ³⁵	2.45 (August 31st, 2022)	Latvia
Luxemburg	1.31	1.3	Germany, France
Slovenia	1.44	1.1 ³⁶	Austria, Italy

³⁰ In Belgium and France, the filling obligations were already in place before 2022.

³¹ National targets of each Member State are sourced from the country's legislation.

³² The obligation is calculated in accordance with the requirements in Article 6c of the Gas Storage Regulation, as 15% of the average consumption in 2017 – 2021 (Eurostat consumption data is used), unless otherwise stated.

³³ 15% of average consumption corresponds to 4 TWh. However, due to technical constraints in Finland's connection to other EU Member States, the obligation has been set at much lower levels.

³⁴ 15% of average consumption corresponds to 9 TWh. However, due to technical limitations in the interconnection with Italy, the obligation has been set by RAE at much lower levels.

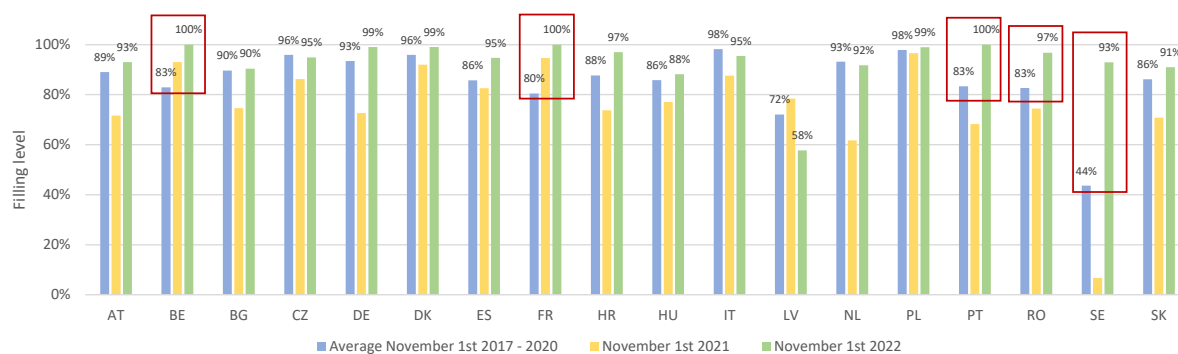
³⁵ The storage obligation in Lithuania is defined in accordance with Article 6c(5) of the Gas Storage Regulation.

³⁶ According to the Energy Agency, in 2022 gas suppliers declared that they stored in neighbouring countries 11% out of the 15% target.

4.2 Contribution of national measures to meeting the filling targets

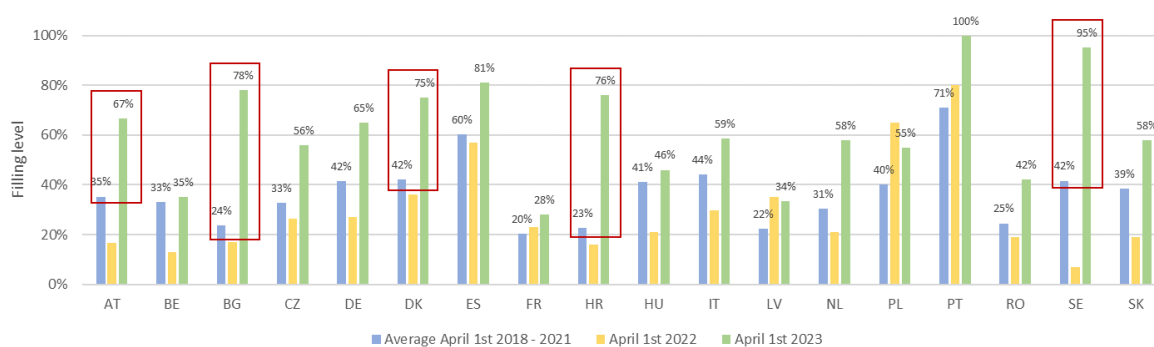
The measures implemented by the Member States in 2022 contributed to attaining storage filling on November 1st, 2022, to similar levels as those observed in the period 2017 – 2020³⁷, despite challenging market conditions during the injection period (Figure 6). In some countries storage filling levels were considerably higher than in the past, even reaching the storage facilities' maximum capacity. Sweden exhibited by far the largest change, increasing gas stocks by 47 percentage points (pp), from 44% to 91%, followed by France (20 pp increase), Belgium (17 pp), Portugal (17 pp), and Romania (14 pp).

Figure 6: Changes in filling levels on November 1st, in the period 2017 – 2022



The difference in filling levels compared to the past was considerably higher at the beginning of the following injection period, April 1st, 2023 (Figure 7). In most Member States, gas stocks remained at significantly higher levels, of at least 20 percentage points more, than in the previous 5 years. Notable cases were Austria (31 pp increase), Denmark (33 pp), Croatia (53 pp), Bulgaria (54 pp) and Sweden (54 pp).

Figure 7: Changes in filling levels on April 1st, in the period 2018 – 2023



In certain cases, the contribution of measures to the filling levels can be clearly derived, while in others it is not possible to identify the part of storage filling resulting from the measures and that due to the commercial use of storage. In particular:

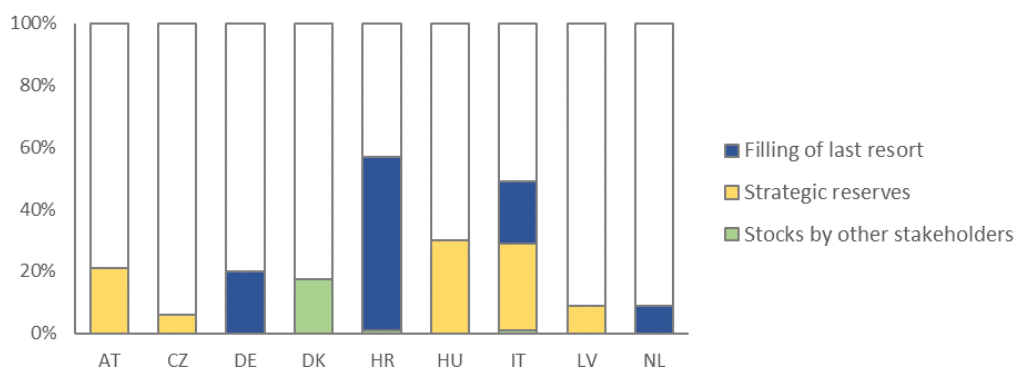
- The impact of measures directly assigning stockholding responsibilities to entities other than suppliers can be determined. This includes cases of storage filling of last resort, and

³⁷ 2021 is not included in the average as in several countries the filling levels were significantly lower than in the past 5 years and would thus distort the observations.

establishment of strategic reserves (regardless of the entity responsible). The contribution of such measures in 2022 is presented in Figure 8.

- Where market participants are assigned with obligations maintaining specific stock levels during the storage cycle, the estimation of the measure's impact is not possible. A storage user's intent to store gas for commercial purposes cannot be distinguished from the gas volumes established exclusively due to its stockholding obligation. This does not include cases where gas suppliers have been tasked with establishing strategic reserves, which remain in storage throughout the year and cannot be sold.
- Managing underutilization of booked capacity overlaps with the impact of other measures. For example, the use of use-it-or-lose-it mechanisms release capacity that is then typically combined with another measure to ensure that the released capacity is utilized.
- Some measures are in place to facilitate others (such as the increased frequency of storage capacity auctions) or to provide incentives to market participants to implement other measures (such as discounts on storage tariffs or subsidies).

Figure 8: Selected cases of measures' impact in storage filling in 2022



With regards to costs for implementing the measures, there is limited information available, and mostly sourced from public or regulated entities responsible for implementing the measures.

In Germany and Denmark, the measures applied in 2022 included, inter alia, the procurement of services from market participants, for filling the storage facilities:

- In Germany, the market area manager, THE, procured 84 TWh of Strategic Storage-Based Options (SSBO) products from market participants, at a **total cost of 852 mil. €**. This included 432 mil. € for 67 TWh of gas that market participants could withdraw after November 1st, 2022, and 420 mil. € for 17 TWh of gas that they had to keep in storage until the end of January 2023, and which THE could buy in case of an emergency. The unit cost of procuring this service amounted to 10.1 €/MWh.
- In Denmark, the TSO, Energinet, procured 1.5 TWh of filling requirements from market participants, at a **total cost of 33.8 mil. €**. These volumes could be sold by the providers of this service only after mid-February 2023. The unit cost of procuring this service amounted to 22.5 €/MWh.

In Austria, Germany and Italy, stakeholders other than market participants had to procure gas to ensure that storages would be filled by November 1st, 2022. due to the limited interest of the market participants to store gas. The gas volumes had to be procured by the stakeholders within a very short timeframe, in Q3 2022, when gas prices were at very high levels³⁸:

- In Austria, ASGM had to establish gas reserves of 20 TWh, at a **cost of around 4 bil. €** (at an average price of 200 €/MWh).
- In Germany, the market area manager, THE, had to buy around 50 TWh as a last resort, at a **cost of 8.7 bil. €** (at an average price of 174 €/MWh).
- In Italy, the TSO, Snam and the state entity GSE had to buy around 34.9 TWh, as a last resort, at a **cost of 6.5 bil. €** (at an average price of 187 €/MWh).

The final cost associated with the implementation of the above measures in Austria, Germany and Italy **should factor in the revenues from selling the gas quantities back to the market**. However, it is expected that only part of these costs can be recovered from the market, as the gas prices gradually decreased after the peak in August 2022, and since the beginning of 2023 have remained below 70 €/MWh.

Table 9 below presents the contribution of each measure on storage filling and the costs of implementing the measure, where such information is available. The measures' contribution is assessed by calculating the share of the gas quantities secured by the measure in the storage capacity. Nevertheless, there is no firm evidence indicating the degree to which a measure alone contributes to the increase in gas stocks, and what storage capacity the market participants would have utilized, even without the measure being in place.

Details on the application of each measure in 2022 and 2023 are included in the country profiles of Annex 2.

³⁸ Indicatively, prices at TTF in Q3 of 2022 were in the range of 150 – 160 €/MWh, and reached an all-time high exceeding 300 €/MWh in August 2022 ([Link](#)).

Table 9: Contribution of measures in storage filling of Member States with underground gas storage and associated costs

Member State	Measures	Timing ³⁹	Filling difference – November 1 st , 2022, and average 2017 – 2020 (pp)	Filling difference – April 1 st , 2022, and average 2017 – 2020 (pp)	Measure contribution		Cost
					% of total GWV ⁴⁰	TWh	
Austria	Minimum volume in gas storage	Amended	4 pp	31 pp	4% (Jan 2023)	3.7 TWh	No info
	Strategic storage	New			21%	20 TWh	4 bil. €
	Unused booked capacities	Old			22% (to date) ⁴¹	21 TWh	No info
Belgium	Tender of capacities	Amended	17 pp	2 pp	Impact cannot be estimated		No info
	Unused booked capacities	Old			Measure not used in practice yet		
	Discounts on storage tariffs	Amended			Impact cannot be estimated	12 mil. € (2022)	
Bulgaria	Minimum volume in gas storage	Old	1 pp	54 pp	No info		No info
	Strategic storage	Old			No info		No info
Croatia	Minimum volume in gas storage	New	9 pp	53 pp	37%	1.8 TWh	No info
	Appointment of dedicated entity	New			56%	2.7 TWh	Loan of 400 mil. €
	Balancing stock managed by TSO	Old			1%	50 GWh	No info
Czech Republic	Obligations imposed on designated entities	Amended	-1 pp	23 pp	Impact cannot be estimated		No info
	Financial incentives (CfDs)	New			12%	4.6 TWh	No info
	Financial incentives (ČEZ State contract)	New			Info not available		No info
	Unused booked capacities	New			11% ⁴²	4.2 TWh	No info
	Minimum volume in gas storage	Old			5%	No info	No info
	Strategic storage	Old			6%	2.4 TWh	ca. 350 mil. €

³⁹ Old: Measure in place prior to the Gas Storage Regulation (not amended), Amended: measure amended due to the Regulation, New: New measure due to the Regulation.

⁴⁰ In 2022 unless otherwise stated.

⁴¹ Overlaps to an extent with the use of strategic storage, as part of the released capacity was used by ASGM to maintain its strategic reserves.

⁴² Overlaps with the contribution of other measures, as part of the released capacity was booked by storage users implementing other measures.

Denmark	Obligations imposed on designated entities	Old	3 pp	33 pp	35% (Jan 2023)	3.2 TWh ⁴³	33.8 mil. €
France	Tender of capacities	Amended	20 pp	8 pp	Impact cannot be estimated		450 mil. € (2023)
	Appointment of dedicated entity	New			Measure not used yet		
Germany	Obligations imposed on designated entities	New	6 pp	24 pp	34%	84 TWh	852 mil. €
	Unused booked capacities	New			Measure not used in 2022 and 2023		
	Strategic storage	New			7%	16.8 TWh ⁴⁴	420 mil. €
	Appointment of dedicated entity	New			20%	50 TWh	8.7 bil. €
Hungary	Minimum volume in gas storage	Old	2 pp	5 pp	30%	19.8 TWh	No info
	Strategic storage	Amended			30%	20.6 TWh	2 bil. € (upper cap)
Italy	Tender of capacities	Amended	-3 pp	14 pp	7%	No info	No info
	Balancing stock managed by TSO	New			1%	No info	No info
	Obligations imposed on designated entities / Appointment of dedicated entity ⁴⁵	New			20%	34.9 TWh	7.3 bil. € (budget ⁴⁶)
	Financial incentives (stock premium)	New			43%	No info	No info
	Financial incentives (CfDs)	New			1%	No info	No info
	Strategic storage	Old			28%	49.3 TWh	N/A ⁴⁷
Latvia	Strategic storage	Amended	-14 pp	11 pp	9% (2023)	2.2 TWh ⁴⁸	No info
Netherlands	Financial incentives for market participants	New	-1 pp	28 pp	9%	12.7 TWh	Zero
	Appointment of dedicated entity	New			9%	12.2 TWh	No info

⁴³ Includes stored gas due to filling requirements (increasing to reach 1.5 TWh in January 2023) and emergency storage/gas procured directly by Energinet (1.7 TWh).

⁴⁴ These volumes are part of the 84 TWh of the contracted SSBO products.

⁴⁵ The measure has been classified by the NRA, ARERA, under both measures of the Gas Storage Regulation.

⁴⁶ Not all the budget was used by Snam and GSE.

⁴⁷ The strategic storage volumes were establishing several years ago, and those costs are not available

⁴⁸ Aggregate of 1.84 TWh maintained by Latvenergo (information for September 2023) and 0.315 TWh by Conexus.

Poland	Obligations imposed on designated entities	Old	1 pp	15 pp	42%	15.9 TWh	No info
Portugal	Minimum volume in gas storage	Amended ⁴⁹	17 pp	29 pp	85%	3.05 TWh	No info
	Tender of capacities	Amended			Measure has no impact on its own		
Romania	Minimum volume in gas storage	New	14 pp	18 pp	88%	29.9 TWh	No info
Slovakia	Minimum volume in gas storage	Old	5 pp	20 pp	No info		No info
Spain	Minimum volume in gas storage	Amended	9 pp	21 pp	83%	28.3 TWh	No info
	Tender of capacities	Amended			No info		No info
	Unused booked capacities	New			Implementation stater 2 nd half 2023		
	Strategic storage	Amended			60%	20.6 TWh ⁵⁰	No info
	Appointment of dedicated entity	New			Measure not used in practice yet		
	Discounts on storage tariffs	New			No impact on its own		21.6 mil. €
Sweden	Appointment of dedicated entity	New	49 pp	54 pp	Measure not applied yet		

⁴⁹ Measure was amended in 2022 but not as a result of the Gas Storage Regulation.

⁵⁰ These amounts are part of the overall stockholding obligations of the entities.

In Member States without underground gas storage, the measures contributed to meeting the stockholding obligation (Table 10). However, in cases where the obligation was assigned to suppliers, the use of the neighbouring storage facilities could, to an extent, take place for commercial reasons.

Table 10: Contribution of measures in storage filling of Member States without underground gas storage in 2022

Member State	Obligation in 2022 (TWh)	Measures in 2022	Impact in 2022 (TWh)
Estonia	0.75	Gas stocks by the TSO	0.13
		Strategic gas stocks	1
Finland	0.96	Mandatory gas stocks by market participants	1.1
Greece	1.14	Mandatory gas stocks by market participants	1.14
Lithuania	1.5	Mandatory gas stocks by market participants	2.45
Luxemburg	1.31	No measures applied in 2022 (measure introduced in 06/2023)	
Slovenia	1.44	No measures applied	

5 Contribution of the measures to the objectives of the Gas Storage Regulation

5.1 Methodology

The Study aims to assess the measures implemented by the Member States with respect to their contribution to the objectives set out in Articles 6b(1) and 6b(2) of the Gas Storage Regulation. The assessment is carried out on the basis of the following criteria:

- a) **Whether the measure is clearly defined, verifiable and transparent:** this criterion concerns whether the measure is described in the regulatory framework in detail, the obligations assigned to entities are transparent, and the outcomes of its implementation are published and verifiable.
- b) **Whether the measure is non-discriminatory:** this criterion refers to the absence of discrimination in the allocation of obligations to entities, and to the extent to which costs are allocated to energy consumers. In this Study, the allocation of costs is assessed on the basis of the number of energy consumers which bear the costs for implementing the measure. Spreading the costs among the taxpayers⁵¹ receives the highest rating in the assessment, followed by the allocation to the natural gas consumers. Allocation of costs only to specific subcategories of gas customers (such as protected customers) is considered as less preferable⁵².
- c) **The effectiveness of the measure in contributing to the storage filling targets:** this criterion relates to the gas volumes put in storage by applying the measure, and the extent to which the measure contributed to increasing withdrawals of gas from storage in 2022.
- d) **The cost-efficiency of the measure's costs:** this criterion concerns the existence of a cost recovery mechanism that allows all costs incurred due to the implementation of the measure to be reimbursed, as well as the existence of any risks related to the collection of the said costs, and whether any incentives or penalties facilitating the implementation of the measure and thus its effectiveness have been applied.
- e) **The effect of the measure on the gas market:** The criterion refers to the impact of the measure on the functioning of gas markets (retail and wholesale market competition, retail prices, storage market), on congestion, either at transmission or storage level, and on organized markets / wholesale prices.

Each measure applied in a Member State is assessed on the basis of the aforementioned criteria, using a qualitative analytical framework. Each criterion is composed of a number of sub-criteria, and measures are rated against each sub-criterion using a qualitative scoring scale, with a range between 0 and 1. The average rating of the examined measure for each sub-criterion is calculated, to facilitate the analysis of the measure's performance.

The Figure below presents the qualitative analytical framework, including the assessed criteria and sub-criteria, the ranking scale of each sub-criterion and the rationale for rating each measure.

⁵¹ The allocation of costs to all taxpayers, through the disbursement of State funds, is used as a proxy for assessing the allocation of costs to all energy consumers.

⁵² The location of the final consumers benefiting from a measure is not examined in this assessment, as the extent to which a measure contributes to the regional security of supply within the Union is not within the scope of this Study.

Figure 9: Analytical framework for assessment of measures

Criteria	Sub-Criteria	Rating rationale	Rate
Clearly defined, verifiable, transparent	The measure and the approach to apply it is clearly defined	The way the measure is implemented is clearly stated and described in the regulatory framework	1
		There is a description in the regulatory framework, but not in full detail	0.5
		The description of the measure in the regulatory framework is vague	0
	The implementation of the measure is monitored and verified	There is one or more entities monitoring implementation of the measure	1
		A monitoring entity has been assigned but without clear responsibilities	0.5
		No explicit monitoring obligation	0
	The application of the measure and its outcomes are transparent	The entity with the obligation publishes information regarding the implementation of the measure	1
		Aggregate information on the measure's performance is published	0.5
		No information about the measure is published	0
	Involved parties are aware of their obligation and costs	The obligations of each party undertaking the obligation is publicly available	1
		Only the aggregate obligation of all parties is published	0.5
		No information on the obligation of the parties is published	0
Non-discriminatory	Non-discriminatory allocation of costs	Allocation of costs to all taxpayers	1
		Allocation of costs only to gas consumers	0.75
		Allocation of costs to selected consumer group(s)	0.5
		Allocation of costs only to specific customers	0
	Non-discriminatory obligations set for involved parties	Allocation of stockholding obligations to all market participants	1
		Allocation of stockholding obligations to only specific market participants	0
	Non-discriminatory obligations set for involved parties	Entities with storing obligations free to sell their stored gas while fulfilling obligations	1
		Limitations imposed to the entities to sell their stored gas at specific consumers	0

Contribution to security of supply	Measure's contribution to storage filling levels	High contribution (>20% of GWV)	1
		Moderate contribution (>10% <20% of GWV)	0.66
		Limited contribution (>1% <10% of GWV)	0.33
		Very limited / immaterial contribution (<1% of GWV)	0
	Measure increased share of stored gas in consumption	High increase	1
		Moderate increase	0.66
		Limited increase	0.33
		Very limited / immaterial increase	0
Efficient financing scheme	Financing for the measure is defined and covers all costs to implement the measure	The costs of the measure are all clearly included in the cost recovery mechanism	1
		Not all costs are clearly in the recovery mechanism	0.5
		Cost recovery is not clearly established	0
	Effective collection of revenues to cover costs	Mechanism is in place that ensures full cost recovery	1
		Market participant may not recover all its costs in full	0.5
		Cost recovery is not clearly established	0
	Incentives to market participants to apply the measure	Incentives and/or penalties are in place to facilitate use of the measure	1
		No penalties or incentives are in place for this measure	0
	Effects on the gas markets	Impact of the measure on gas markets and competition	Non measurable impact on gas markets
Moderate impact on gas markets			0.5
Significant impact on gas markets			0
Impact of the measure on infrastructure congestion		No congestion due to the measure	1
		Congestion due to the measure	0
Impact on gas prices and operation of organized gas markets		Non measurable impact on wholesale gas prices	1
		Moderate impact on wholesale gas prices	0.5
		Significant impact on wholesale gas prices	0

The findings of the analysis for each measure are discussed in the remainder of this Section. This analysis includes an overview of the measures' implementation, and its qualitative assessment. The detailed assessment of the measures per country is presented in Annex 4.

5.2 Minimum volume in gas storage (point (a) of Article 6b(1))

5.2.1 Implementation of measure

A commonly used measure amongst the Member States is assigning to market participants the obligation to maintain minimum gas stocks in storage.

In 5 out of the 9 Member States applying the measure, the mechanism was already in place prior to the Gas Storage Regulation. In 3 Member States, the pre-existing measure was amended in 2022, to ensure compliance with the targets of the Gas Storage Regulation. Only in Croatia a temporary measure was established in 2022, for the gas years 2022/23 and 2023/24.

Table 11: Minimum volume in gas storage – Timing of introduction and duration

Timing of introduction	AT	ES	HR	RO	BG*	CZ*	HU*	PT*	SK*
New measure in 2022/23			✓						
Existing measure amended in 2022/23	✓	✓		✓				✓	
Existing measure not amended					✓	✓	✓		✓
Temporary measure (2022/23 – 23/24)			✓						
Permanent measure ⁵³	✓	✓		✓	✓	✓	✓	✓	✓

* Measure prior to Gas Storage Regulation

The **types of market participants that minimum storage obligations are assigned to differ among Member States**. In Spain and Romania, all suppliers selling gas to final consumers undertake stockholding responsibilities. In Austria, the Czech Republic, Portugal and Slovakia, only the suppliers of protected customers are assigned such an obligation that is mostly linked with requirements under the supply standard (Article 6 of the Security of Supply Regulation). In some cases, final consumers are also required to undertake storage obligation responsibilities, such as heat producers (in Romania), and large consumers importing gas for their own consumption (in Spain and Slovakia). Finally, in Hungary, the stockholding obligation is assigned to the appointed universal supply provider (only one is currently operating the market supplying all households), and in Slovakia, the DSOs also undertake such responsibilities for household consumers.

Table 12: Minimum volume in gas storage – Entities implementing the measure

Entities implementing the measure	AT	ES	HR	RO	BG*	CZ*	HU*	PT*	SK*
Suppliers of all final consumers		✓		✓					
Suppliers of protected customers	✓					✓		✓	✓
Specific market participant(s)					✓		✓		
All storage users with firm capacity			✓						
DSOs									✓
Final consumers (own consumption)		✓		✓					✓

* Measure prior to Gas Storage Regulation

Costs for establishing and maintaining stocks are passed-on to final consumers (i.e., suppliers include part or whole of these costs in their end-user tariffs, according to their pricing policy), except in

⁵³ Measures considered as permanent include those implemented until the end of 2025 (i.e., the end of the Gas Storage Regulation).

Slovakia, where the measure is a public service obligation and net costs are recovered from the State budget.

Typically, the measure involves penalties for non-compliance, in the form of use-it-or-lose-it (UIOLI) clauses and imbalance charges. In Spain, incentives are offered to the market participants (zero reserve price) and in Croatia there is a system of discounts on transmission tariffs.

Table 13: Minimum volume in gas storage – Financing mechanism

Financing mechanism	AT	ES	HR	RO	BG*	CZ*	HU*	PT*	SK*
Recovery of costs									
Paid by end-users	✓	✓	✓	✓	✓	✓	✓	✓	
State budget									✓
Incentives / penalties									
Tariff discount ⁵⁴		✓	✓						
Penalty	✓	✓			✓	✓	✓	✓	
UIOLI			✓						
Imbalance charges		✓							

* Measure prior to Gas Storage Regulation

Monitoring of this measure is usually carried out by the country’s energy Ministry and/or the NRA. In Spain, a separate entity (the Corporation for Strategic Reserves of Petroleum Products) monitors the compliance of market participants with their obligations.

Table 14: Minimum volume in gas storage – Entities monitoring the measure

Entities monitoring the measure	AT	ES	HR	RO	BG*	CZ*	HU*	PT*	SK*
Ministry responsible for energy			✓					✓	✓
NRA	✓			✓		✓	✓	✓	✓
TSO								✓	
Other State entity		✓							

* Measure prior to Gas Storage Regulation

5.2.2 Analysis of measure’s contribution

The Table below provides an overview of the qualitative analysis performed on the contribution of the measure “Minimum volume in gas storage” to the objectives of the Gas Storage Regulation.

⁵⁴ Discount of either storage or transmission tariffs.

Table 15: Minimum volume in gas storage – Qualitative analysis⁵⁵

Criterion	Sub-criterion	AT	ES	HR	RO	BG*	CZ*	HU*	PT*	SK*	Avg.
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	●	●	●	●	◐	●	●	●	●	◐
	Monitored and verified implementation	●	●	●	●	◐	●	●	●	●	◐
	Transparent application and outcomes	◐	○	○	○	○	○	●	○	-	◐
	Involved parties are aware of their obligation and costs	◐	●	◐	●	◐	◐	●	○	-	◐
Non-discriminatory	Non-discriminatory allocation of costs	N/A	N/A	N/A	N/A	N/A	N/A	◐	N/A	●	◐
	Non-discriminatory obligations set for involved parties	●	●	●	●	◐	●	●	●	●	◐
	Access to the stored gas not limited to specific uses	●	●	●	●	●	●	●	N/A	●	●
Contribution to security of supply	Measure impact on storage filling levels	◐	●	●	●	-	◐	●	●	-	◐
	Measure increased share of stored gas in consumption	○	○	○	○	N/A	N/A	○	○	○	○
Cost estimation	Financing is defined and covers all required costs	N/A	N/A	N/A	N/A	N/A	N/A	●	N/A	●	●
	Effective collection of revenues to cover costs	◐	◐	◐	◐	◐	◐	●	◐	●	◐
	Incentives provided for applying the measure	●	●	●	-	-	●	●	●	●	●
Effects on the gas markets	Impact on gas markets and competition	●	◐	-	-	-	◐	●	◐	-	◐
	Impact on infrastructure congestion	-	○	●	●	-	●	●	○	-	◐
	Impact on operation of organized markets	-	-	-	-	-	●	●	-	-	●

* Measure prior to Gas Storage Regulation

5.2.2.1 Clarity & transparency

The measure is **described with clarity** in the regulatory framework of almost all Member States, in the primary legislation and/or in decisions by the NRA or the competent Ministry. In Bulgaria, however, it appears that the measure is not fully described in the regulation. The Law sets the main principles for implementing the measure, with just few additional details included in the emergency plan issued by the Ministry of Energy.

All countries have established a **monitoring mechanism** to ensure compliance of the obligated entities with their targets. The authorities responsible for monitoring and verification receive, from involved parties, periodic reports and in some cases ad hoc information, concerning gas stocks and booked capacity. In countries where the NRA is the monitoring authority, the obligated entities are directly

⁵⁵ ●: Max. contribution / ○: Min. contribution / "N/A": criterion not applicable for the specific measure / "-": No information available for the particular Member State

responsible for reporting, while where the monitoring authority is the Ministry or a State entity, the information is provided by the SSO or TSO.

Obligated entities are not required to publish information on their gas stock levels and targets in all Member States applying the measure. At the same time, the obligations of each individual entity are not published by the competent authorities, apart from Romania and Hungary, where the NRAs publish the obligation of the suppliers.

This lack of transparency with regards to the individual targets is reasonable, as the entities undertaking stockholding responsibilities are suppliers, with their obligations defined on the basis of their gas sales or booked storage capacity, which is considered as sensitive information. However, often there is lack of information even on an aggregate level, i.e., for the collective stockholding responsibilities of all entities. There are only a few exceptions, such as Croatia, where the collective storage filling obligations of the entities, expressed as a share of their booked capacity, are published. As a result, in most cases the **outcomes of the measure are not fully transparent and cannot be verified.**

5.2.2.2 *Non-discriminatory*

The stockholding responsibilities under this measure are mainly assigned to gas suppliers, and in few cases to large final consumers that buy gas on a wholesale level. In some Member States all the suppliers of final consumers are responsible (Spain, Croatia, Romania), but in most cases only suppliers of specific customer categories, usually protected customers, undertake the obligation (Austria, Czech Republic, Portugal, Slovakia, Hungary)⁵⁶. In the latter case, although the stockholding responsibilities are not allocated to all suppliers in the market, this cannot be considered as discriminatory, as the stockholding obligations are linked to implementing the supply standard, by storing gas in the underground facilities. The allocation of responsibilities among the suppliers is carried out in a fair and non-discriminatory manner, on the basis of their gas sales to final customers. These obligations are either directly calculated by the competent authorities or validated with information (such as supply contracts) provided by the suppliers. Based on the above, the **allocation of obligations for implementing the measure is considered as non-discriminatory.**

In most cases, the suppliers that undertake stockholding responsibilities are operating in the open market. Each supplier may recover its costs arising from implementation of the measure by allocating part or whole of the related costs to its final customers, following its own pricing strategy. In these cases, it is **not possible to assess non-discrimination of the cost allocation**, due to the lack of information. Hungary is an exception, as tariffs of the universal supplier are regulated, and costs are allocated to households and microenterprises, who are the recipients of the universal service. Slovakia is the only case where the costs are allocated to all taxpayers, as they are recovered through the State budget.

There are **no limitations on how suppliers release their stored gas to the market**. Apart from the filling trajectories and targets that have to be met, the storage users are free to withdraw gas from the storage facilities to supply their consumers, in accordance with their commitments.

⁵⁶ Only Bulgaria follows a different approach, assigning responsibilities on suppliers of consumers with seasonal demand.

5.2.2.3 Contribution to security of supply

The **contribution of the stockholding measure on gas storage filling varies from country to country** and is dependent on how the obligations of the entities are calculated, as well as on the country's storage capacity. For the Member States where information is available, the following observations can be made:

- In Austria and the Czech Republic, where suppliers are required to store gas to meet the supply standard, the respective gas volumes in 2022 accounted for only a small portion of these two countries' large storage capacity (4.5% and 5% of the capacity respectively).
- In Spain the stockholding obligations involve all suppliers, while in Portugal obligations are imposed on suppliers of protected customers and large consumers. This widespread obligation, combined with the countries' limited storage capacity, resulted in high levels of storage filling, 83% and 85% of their capacity respectively.
- In Romania, the obligation of the suppliers is directly linked with achieving a 90% storage filling, therefore the contribution of the measure is already predefined.
- In Croatia, suppliers stored gas volumes that corresponded to 37% of the country's capacity.

The measure does not appear to have any effect in increasing the withdrawal of gas from the storage facilities during the winter period. On the contrary, the filling levels of the countries indicate that in several cases storage users maintained more gas in storage than in the past.

Therefore, it is not possible to derive a common thread for the **measure's contribution to security of supply**. This **depends on how the storage obligations are allocated** to the suppliers in each Member State.

5.2.2.4 Cost efficiency

In all Member States implementing the measure, stockholding obligations are set primarily to suppliers and in some cases to final consumers. The prices charged by the suppliers to their customers are in the majority of cases not regulated, so each supplier required to maintain stocks is reimbursed for its costs associated with this measure according to its own strategy⁵⁷ (e.g., cross-subsidizing end-user prices for different consumer categories to ensure its competitiveness in the market). Therefore, there is **no explicit and commonly used mechanism for how the obligated entities' costs are passed-on to final users**.

As the obligated entities operate in a competitive environment, **recovery of the costs that the entities incur in stockholding is not secured**. For example, suppliers may not be able to pass-on all their stockholding costs to customers, in case their market share decreases, or they cannot collect all revenues from the customers.

In most countries, the mechanism is **supplemented by the provision of incentives and/or penalties**, to ensure that the obligated entities will meet their storage filling targets. These are in the form of

⁵⁷ Some exceptions to this general observation apply. In Slovakia the net costs of the obligated entities can be compensated through the State budget. Also in Hungary, the entity with the stockholding obligations is the universal supplier that recovers its costs through a regulated tariff charged to the households and microenterprises.

financial penalties (Austria, Spain, Czech Republic, Portugal, Hungary, Slovakia), and UIOLI mechanisms for unused capacity (Croatia). In Romania, Bulgaria and Slovakia it is not clear whether a mechanism is in place to ensure that the obligated entities maintain their minimum stocks in storage.

5.2.2.5 *Impact on gas market*

In principle it can be **assumed that implementation of this measure would have a small impact on the wholesale and retail markets**. In most cases the suppliers' obligations are linked to their gas sales, therefore the implementation of the measure would not lead the suppliers to procure considerably higher gas volumes than they initially intended (unless their position in the market changed substantially from year to year). Nevertheless, the market participants have to buy gas driven by the need to meet the filling trajectories, which may differ from their market strategy, and thus may result in procuring gas at higher prices than they would like to. Furthermore, the suppliers are required to pay for storage capacity even in case they did not need to store gas for commercial reasons. This may result in a **limited increase of retail prices, but it may also pose financing risks and challenges especially for smaller suppliers**. It should be noted that there is no concrete evidence to isolate the impact of the stockholding measure on the gas markets, considering that gas prices are affected by multiple factors related to the market environment and the operation of the market participants themselves, and consequently the in-vitro impact of any single measure cannot be isolated.

In one instance, **the behaviour of some market participants was observed to have changed** in response to the imposing of storage filling obligations. In the Czech Republic, some suppliers limited their portfolio of protected customers and avoided supplying new protected customers with high consumption, so as to minimize their gas stock obligations and to limit exposure to high prices. No other similar cases, however, have been reported by NRAs during the collection of information for the Study.

Impacts of the measure's implementation in the storage market were observed. In Spain and Portugal, the increased use of storage capacity to meet the stockholding obligations (which became higher than in the past following amendments in the regulatory framework), impacted the flexibility of the gas system, with operational consequences on the LNG terminals. In both countries, underground storage facilities were used as temporary buffers of LNG storages, in cases when vessels needed to unload at an LNG regasification terminal whose tanks were full. Due to the limited available underground storage capacity, unloading of LNG carriers to the terminals was delayed, increasing costs. No cases of system congestion were reported in other countries, despite the very large share of capacity being booked to comply with the stockholding requirements in certain countries (in Romania almost 90% of the capacity was booked to that end).

There is **no evidence that purchases of gas volumes** by market participants, to meet their minimum volume obligations, **impacted wholesale prices**. Nevertheless, since the measure does not lead to substantial changes to the behaviour of the suppliers in the market and there would not be significant need to withdraw gas from the market, **limited effects on prices cannot be excluded**.

5.2.3 Key findings

Minimum volume in gas storage (point (a) of Article 6b(1))

- 9 Member States (AT, ES, HR, RO, BG, CZ, HU, PT, SK) have assigned to market participants the obligation to maintain minimum gas stocks in storage.
- Most of these countries had the measure in place before the Gas Storage Regulation entered into force (usually storage requirement to meet the supply standard) and continue to apply it without amendments.
- The obligations are assigned to suppliers selling gas to all consumers or to selected customer categories (primarily protected customers). In some countries large final consumers supplying gas on their own also undertake stockholding responsibilities. Allocation of obligations is deemed as non-discriminatory, carried out on the basis of entities' gas sales.
- The measure is clearly defined, and monitoring mechanisms are in place.
- No information is published, either for the individual filling targets and gas stocks or on aggregate level for all entities together. The outcomes of the measure are not fully transparent and cannot be verified.
- There is no administrative cost recovery mechanism in place. Each supplier may recover its costs by allocating part or whole of the costs to its final customers following its own pricing strategy. In most countries the mechanism is supplemented by the provision of incentives and/or penalties (financial penalties, UIOLI, tariff discounts).
- As the costs are recovered from the activities of each obligated entity in a competitive environment, recovery of the entities' costs is not always guaranteed.
- The contribution of the measure to storage filling varies. In Spain and Portugal, storage filling exceeded 80% of the countries' capacity in 2022, while in Austria and the Czech Republic, it remained below 5%.
- In Spain and Portugal, the enhanced gas storage capacity utilisation reduced system flexibility in cases where LNG terminals' storages were full.

5.3 Tender of capacities (point (b) of Article 6b(1))

5.3.1 Implementation of measure

Capacity auctions are a commonly used allocation mechanism in various Member States. They have been in place for several years before the Gas Storage Regulation entered into force. The Study reviewed changes implemented in the capacity allocation mechanisms in 2022⁵⁸, aiming to facilitate booking and provide incentives/disincentives to market participants to book and use the storage capacity.

In Belgium, France and Spain, booking of capacity is linked with storage filling obligations for the storage users. In Belgium and France these obligations were already in place prior to the Gas Storage Regulation. In Spain the requirements were introduced in 2022 and are a prerequisite for receiving a zero reserve price for the booked capacity.

The measures in place are permanent, except in Italy, where the increased frequency of auctions and the discounts on storage tariffs were temporarily introduced only for storage year 2022/23.

⁵⁸ Portugal also amended its capacity allocation rules in 2022, however these changes were not a direct result of the obligations set by the Gas Storage Regulation.

Table 16: Tender of capacities – Timing of introduction and duration

Timing of introduction	BE	ES	FR	IT	PT*
New measure in 2022/23					
Existing measure amended in 2022/23	✓	✓	✓	✓	✓
Existing measure not amended					
Temporary measure (2022/23)				✓	
Permanent measure	✓	✓	✓		✓

* Measure prior to Gas Storage Regulation

The SSOs (in Spain the Technical System Manager – Enagás GTS) have the responsibility for carrying out the capacity tenders.

Table 17: Tender of capacities – Entities implementing the measure

Entities implementing the measure	BE	ES	FR	IT	PT*
SSOs / Technical System Manager	✓	✓	✓	✓	✓

* Measure prior to Gas Storage Regulation

In all countries offering discounts, SSOs are compensated for any potential under-recovery of regulated revenues stemming from the contracting of capacity below the regulated tariff. A revenue reconciliation mechanism is used in France and Italy (transmission tariffs charges to final consumers) as well as in Belgium (storage regularization account). In Spain, State funds are allocated to compensate Enagás GTS. In Portugal the SSO’s costs for implementing the measure are immaterial.

Table 18: Tender of capacities – Financing mechanism

Financing mechanism	BE	ES	FR	IT	PT*
Recovery of costs					
Paid by end-users	✓				
State budget		✓			
Storage tariffs					✓
Transmission tariffs (exc. Cross-border points)			✓	✓	
Incentives / penalties					
Tariff discount	✓	✓		✓	N/A
Subsidy				✓	
Contract for difference				✓	
Penalty	✓	✓		✓	
UIOLI	✓			✓	
Imbalance charges		✓			

* Measure prior to Gas Storage Regulation

In most countries monitoring is carried out by the NRA, as part of the overall monitoring of the SSO’s activities. Only in Portugal monitoring is carried out by the TSO.

Table 19: Tender of capacities – Entities monitoring the measure

Entities monitoring the measure	BE	ES	FR	IT	PT*
Ministry responsible for energy				✓	✓
NRA	✓	✓	✓	✓	✓
TSO					✓
Other State entity					

* Measure prior to Gas Storage Regulation

5.3.2 Analysis of measure's contribution

The Table below provides an overview of the qualitative analysis performed on the contribution of the measure “Tender of capacities” to the objectives of the Gas Storage Regulation.

Table 20: Tender of capacities – Qualitative analysis

Criterion	Sub-criterion	BE	ES	FR	IT	PT*	Avg.
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	●	●	●	●	●	●
	Monitored and verified implementation	●	●	●	●	●	●
	Transparent application and outcomes	●	●	●	●	●	●
	Involved parties are aware of their obligation and costs	●	●	●	●	●	●
Non-discriminatory	Non-discriminatory allocation of costs	N/A	●	◐	◐	N/A	◐
	Non-discriminatory obligations set for involved parties	●	●	●	●	●	●
	Access to the stored gas not limited to specific uses	●	●	N/A	●	●	●
Contribution to security of supply	Measure impact on storage filling levels	N/A	N/A	N/A	◐	N/A	◐
	Measure increased share of stored gas in consumption	○	○	○	○	N/A	○
Cost estimation	Financing is defined and covers all required costs	N/A	●	●	●	●	●
	Effective collection of revenues to cover costs	◐	●	●	●	●	◐
	Incentives provided for applying the measure	●	●	●	●	N/A	●
Effects on the gas markets	Impact on gas markets and competition	●	●	●	●	●	●
	Impact on infrastructure congestion	●	○	●	●	●	◐
	Impact on operation of organized markets	●	●	●	●	●	●

* Measure prior to Gas Storage Regulation

5.3.2.1 Clarity & transparency

The measure is **described with clarity** in the regulatory framework of all Member States implementing it, in the primary legislation, regulations/decrees by the NRA or the competent Ministry, or within the storage code.

A **monitoring mechanism is in place** in all countries. As the measure concerns offering of storage capacity, monitoring is carried out by NRAs, within the frame of monitoring the activities of the SSOs.

In all countries, participation to the capacity tenders, the terms and conditions for contracting capacity and the outcomes of all capacity tenders are publicly available. Therefore, the results of the measure can be considered as both **transparent and verifiable**.

In cases where booking of capacity is linked to specific storage filling obligations by the users (Belgium, France and Spain), information on the responsibilities and the level of compliance is available only on an aggregate level, but not individually for each storage user.

5.3.2.2 Non-discriminatory

In France, Italy and Belgium, all market participants have access to the storage capacity tenders related to the measure, while in Spain and Portugal all entities with stockholding obligations can participate in the capacity allocation procedures, which are done exclusively for the gas stock quantities. Therefore, there is **no discrimination in the accessibility of obligated entities to capacity** when applying this measure.

In the Member States where discounts are offered to the storage charges, the approach used to reimburse the SSOs, in case of revenue under-recovery, varies. In Belgium, France and Italy, the SSOs are reimbursed through reconciliation mechanisms. In Spain, funds are secured from the State budget. These different approaches result in having a **different allocation of the measure's costs to the energy consumers**; recovery through the tariffs allocates costs only to gas consumers, whereas using funds from the State allocates costs to all taxpayers.

5.3.2.3 Contribution to security of supply

It is not possible to **isolate the impact of the changes made in the capacity allocation process** to storage filling vis-à-vis the intentions of the market participants to utilize capacity for commercial purposes.

5.3.2.4 Cost efficiency

In most Member States, changes in the **capacity allocation mechanisms were combined with the provision of incentives** (auctions at zero reserve price) to incentivize market participants to book and use storage capacity. **There are mechanisms in place**, as discussed in Section 5.3.2.2, to reimburse the SSOs for any losses of their revenues, due to the offering of incentives.

The costs are recovered either from the system users or from the State, and thus **collection of the required funds by the SSOs is ensured**.

In Belgium, the obligations set to the storage users are accompanied by a penalty mechanism, to ensure compliance. Any costs incurred by the users to meet these obligations are recovered from their final customers, and there are thus potential risks that these costs may not be recovered in full (e.g., in case a supplier's market share is reduced).

5.3.2.5 Impact on gas market

The changes to the capacity allocation mechanisms, and the provision of incentives in some cases, **do not appear to have led to measurable effects in the wholesale and retail gas markets and prices**. The measures aimed at facilitating capacity booking by market participants and were not directed towards leading the storage users to procure additional gas quantities.

In most countries no impacts of the measure to the storage market were observed. Only in Spain, capacity was congested in January 2023. Increased interest from market participants to book capacity for the storage year 2023/24, due to the zero reserve price in the auctions, could not be met by the capacity available for commercial use, which was limited due to the high capacity needs for storing the mandatory gas stocks.

5.3.3 Key findings

Tender of capacities (point (b) of Article 6b(1))

- 5 Member States (BE, ES, FR, IT, PT) changed their capacity allocation mechanisms, to facilitate booking and provide incentives to market participants to book and use storage capacity.
- In all Member States, the capacity allocation mechanism pre-existed the Gas Storage Regulation and was amended to address the storage filling targets and trajectories.
- The measure is clearly defined. NRAs monitor implementation. The terms and conditions and results of the tenders are published.
- In Belgium and France, the pre-existing storage filling obligations to storage users continued to apply (with stricter penalties/monitoring in the case of Belgium). In Spain, the zero reserve price incentive was linked to specific storage filling levels.
- Storage capacity was offered at discounted or zero reserve price in Belgium, Italy and Spain. In France, a zero reserve price applies for auctions for the subsequent year. Cost recovery mechanisms are in place in all countries, ensuring reimbursement for any under-recovery of revenues.
- It is not possible to estimate the impact of the changes in the capacity allocation process to the filling targets, as capacity utilization for meeting the obligations cannot be isolated from commercial use.
- The measure does not appear to have led to measurable impacts on the gas market. Capacity was congested only in one month in Spain, where the discounts attracted more interest in commercial use capacity than in the past.

5.4 Balancing stock managed by TSO (point (c.1) of Article 6b(1))

5.4.1 Implementation of measure

Use of storages by the TSOs to maintain gas for operational and balancing purposes is only foreseen in Italy and Croatia. In Italy the measure is mandatory but temporary only for gas year 2022/23. In Croatia the measure is permanent but voluntary for the TSO, which may also store gas at the LNG terminal.

Table 21: Balancing stock managed by TSO – Timing of introduction

Timing of introduction	IT	HR*
New measure in 2022/23	✓	
Existing measure amended in 2022/23		
Existing measure not amended		✓
Temporary measure (2022/23)	✓	
Permanent measure		✓

* Measure prior to Gas Storage Regulation

The measure is only implemented by the Member States' TSOs.

Table 22: Balancing stock managed by TSO – Entities implementing the measure

Entities implementing the measure	IT	HR*
TSO	✓	✓

* Measure prior to Gas Storage Regulation

In Italy the costs incurred by the TSO for storing gas are recovered through the so-called neutrality tariff, while in Croatia the TSO's costs are included in the transmission tariffs. No incentives or penalties are in place explicitly for this measure in either country.

Table 23: Balancing stock managed by TSO – Financing mechanism

Financing mechanism	IT	HR*
Recovery of costs		
Transmission tariffs		✓
Neutrality tariff	✓	
Incentives / penalties		
N/A		

* Measure prior to Gas Storage Regulation

In Italy, the NRA monitors the implementation of the measure. In Croatia, there are no monitoring requirements as the measure is optional for the TSO.

Table 24: Balancing stock managed by TSO – Entities monitoring the measure

Entities monitoring the measure	IT	HR*
Ministry responsible for energy		N/A
NRA	✓	
Other State entity		

* Measure prior to Gas Storage Regulation

5.4.2 Analysis of measure's contribution

The Table below provides an overview of the qualitative analysis performed on the contribution of the measure "Balancing stock managed by TSO" to the objectives of the Gas Storage Regulation.

Table 25: Balancing stock managed by TSO – Qualitative analysis

Criterion	Sub-criterion	IT	HR*	Avg.
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	●	●	●
	Monitored and verified implementation	●	○	◐
	Transparent application and outcomes	●	○	◐
	Involved parties are aware of their obligation and costs	●	●	●
Non-discriminatory	Non-discriminatory allocation of costs	◐	◐	◐
	Non-discriminatory obligations set for involved parties	●	N/A	●
	Access to the stored gas not limited to specific uses	●	N/A	●

Contribution to security of supply	Measure impact on storage filling levels	N/A		
	Measure increased share of stored gas in consumption		N/A	
Cost estimation	Financing is defined and covers all required costs			
	Effective collection of revenues to cover costs			
	Incentives provided for applying the measure			
Effects on the gas markets	Impact on gas markets and competition			
	Impact on infrastructure congestion			
	Impact on operation of organized markets	-		

* Measure prior to Gas Storage Regulation

5.4.2.1 Clarity & transparency

The measure is **described with clarity** in the regulatory framework of both Member States implementing it. It is noted however that in Croatia the measure is optional for the TSO, and thus there are no monitoring procedures and publication requirements in place.

In Italy the implementation of this **measure is monitored** by the NRA. The Italian TSO, Snam, publishes information regarding the purchases of gas to fulfil its obligations within this measure, along with relevant costs. Therefore, the results of the measure **are transparent and can be verified**.

5.4.2.2 Non-discriminatory

The obligations under this measure are assigned directly to the TSO, **therefore assessment of non-discrimination is not relevant**. Accessibility to the stored gas is also not relevant as the gas quantities secured are intended for the operation and balancing of the system.

The costs incurred by the TSO for implementing this measure in Italy and Croatia (if the TSO opts to use the storage) are recovered through the neutrality charges and the transmission tariff respectively. In both cases the costs are allocated **only to gas consumers and not to all the energy consumers** of the country.

5.4.2.3 Contribution to security of supply

The **contribution of this measure to the storage filling levels is very limited**, as it only concerns storing gas to be used for the TSOs' (in the case of Italy also of the SSOs') own consumption. Both in Italy and Croatia, the volumes stored by the TSOs corresponded to just 1% of the country's storage capacity.

5.4.2.4 Cost efficiency

A mechanism is in place reimbursing the TSOs for all the costs incurred due to the measure's implementation (procurement of gas, booking of capacity, potential financing costs). In Croatia all costs are included in the allowed revenue of the TSO and recovered through the transmission tariff. In Italy, the costs are recovered as part of the neutrality mechanism for the balancing of the gas transmission system. In both cases the charges are paid by the system users, and thus the **collection of the required funds by the TSOs is ensured**.

There are **no incentives or penalties** in place for the TSOs explicitly for implementing this measure.

5.4.2.5 Impact on gas market

The measure **does not have an impact on the gas market competition and prices**. The volumes stored by the TSOs are very small, and they should be procured by the operators in any case for operating the system (albeit perhaps at a different timing).

5.4.3 Key findings

Balancing stock managed by TSO (point (c.1) of Article 6b(1))

- The TSOs have been tasked to store gas for their own consumption only in Croatia (old measure) and Italy (temporary measure for storage year 2022/23). In Croatia storing of gas is optional for the TSO.
- The measure is clearly defined. In Italy the measure is monitored by the NRA, and the TSO publishes information on the gas stocks established, allowing verification of the measure's results. In Croatia there is no monitoring obligation as the measure is optional.
- A mechanism is in place for reimbursing the TSOs for all the costs incurred for procuring and storing gas. The costs are recovered from system users and are thus allocated to all gas consumers.
- The impact of the measure on storage filling levels is very limited, as it only concerns storing gas to be used for the TSO's (in the case of Italy also of the SSOs') own consumption.

5.5 Obligations imposed on designated entities (point (c.2) of Article 6b(1))

5.5.1 Implementation of measure

Several Member States are imposing obligations to entities of the gas sector, in order to meet the filling requirements.

In 2 out of the 5 Member States the obligations were established in 2022 (Germany, Italy). In the Czech Republic, the obligations already in place were amended to match the filling obligations of the Gas Storage Regulation. In Denmark and Poland, the mechanisms in place prior to the Regulation were deemed as sufficient to meet the targets. In most cases the obligations are permanent, except for Italy (only for storage year 2022/23).

Table 26: Obligations imposed on designated entities – Timing of introduction

Timing of introduction	CZ	DE	IT	DK*	PL*
New measure in 2022/23		✓	✓		
Existing measure amended in 2022/23	✓				
Existing measure not amended				✓	✓
Temporary measure (2022/23 – 23/24)			✓		
Permanent measure	✓	✓		✓	✓

* Measure prior to Gas Storage Regulation

The entities responsible for meeting stockholding obligations vary from one Member State to another. In Italy, the largest TSO (Snam) and a State entity (GSE) have to provide last resort filling services. In Germany, the market area manager, procures services for filling requirements from market participants through tenders. In Denmark the TSO secures gas for emergency situations either by procuring filling requirements, or by directly purchasing and gas from the market and storing it. In

Poland the obligations are imposed to all entities importing gas, while in the Czech Republic stockholding is assigned to the storage users.

Table 27: Obligations imposed on designated entities – Entities implementing the measure

Entities implementing the measure	CZ	DE	IT	DK*	PL*
Specific market participant(s)					
All storage users with firm capacity	✓			✓	
System users / BRPs		✓			
Importers ⁵⁹					✓
TSO			✓	✓	
Market Operator		✓			
State Agency/Entity			✓		

* Measure prior to Gas Storage Regulation

The financing mechanism of the measure depends on the entity to which the obligation has been imposed. Where the market participants must establish stocks (Czech Republic, Poland), the costs are recovered from their final customers. In Italy, State funds are utilized to cover costs. In Germany the costs are recovered through a neutrality tariff, charged to all physical exit points including cross-border points. In Denmark an emergency tariff applies directly to final consumers.

Table 28: Obligations imposed on designated entities – Financing mechanism

Financing mechanism	CZ	DE	IT	DK*	PL*
Recovery of costs					
Paid by end-users	✓				✓
State budget			✓		
Emergency tariff				✓	
Neutrality charges (incl. Cross-border points)		✓			
Incentives / penalties					
Tariff discount	✓		N/A		
Contract for difference	✓				
Penalty		✓			
UIOLI	✓				
Payment of missing gas volumes					✓

* Measure prior to Gas Storage Regulation

The monitoring of the measure’s implementation is carried out by the Ministry, usually supported by the NRA. In Denmark the measure is monitored by the Danish Energy Agency, which is part of the Ministry.

⁵⁹ Including all entities importing gas (suppliers, operators, final consumers).

Table 29: Obligations imposed on designated entities – Entities monitoring the measure

Entities monitoring the measure	CZ	DE	IT	DK*	PL*
Ministry responsible for energy	✓	✓	✓	✓	✓
NRA	✓	✓	✓		✓
Other State entity					

* Measure prior to Gas Storage Regulation

5.5.2 Analysis of measure’s contribution

The Table below provides an overview of the qualitative analysis performed on the contribution of the measure “Obligations imposed on designated entities” to the objectives of the Gas Storage Regulation.

Table 30: Obligations imposed on designated entities – Qualitative analysis

Criterion	Sub-criterion	CZ	DE	IT	DK*	PL*	Avg.
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	●	●	●	●	●	●
	Monitored and verified implementation	●	●	●	●	●	●
	Transparent application and outcomes	◐	◐	●	◐	○	◐
	Involved parties are aware of their obligation and costs	◐	◐	●	◐	◐	◐
Non-discriminatory	Non-discriminatory allocation of costs	N/A	◐	●	◐	◐	◐
	Non-discriminatory obligations set for involved parties	●	●	N/A	●	●	●
	Access to the stored gas not limited to specific uses	●	●	●	●	N/A	●
Contribution to security of supply	Measure impact on storage filling levels	◐	●	◐	●	●	◐
	Measure increased share of stored gas in consumption	○	○	○	N/A	○	○
Cost estimation	Financing is defined and covers all required costs	N/A	●	●	●	●	●
	Effective collection of revenues to cover costs	◐	●	●	●	◐	◐
	Incentives provided for applying the measure	●	●	○	●	●	◐
Effects on the gas markets	Impact on gas markets and competition	●	●	●	●	●	●
	Impact on infrastructure congestion	●	●	●	●	●	●
	Impact on operation of organized markets	-	-	◐	●	●	◐

* Measure prior to Gas Storage Regulation

5.5.2.1 Clarity & transparency

The measure is **described with clarity** in the regulatory framework of all relevant Member States, in the primary legislation and/or in decisions by the competent Ministry, except in the case of Denmark where the measure is part of the emergency measures defined in the emergency plan.

A **mechanism is in place** in all countries, to **monitor** compliance of the obligated entities with their targets. The authority responsible for monitoring and verification receives regular reports directly by the obligated entities or the SSOs, with information regarding the gas stocks and booked capacity of each entity.

The **obligations imposed on the entities are transparent in most cases**. In Germany when the market area operator launches tenders to procure filling requirements from market participants, it publishes both the requested quantities and the resulting contracted quantities. A similar practice is followed when the TSO carries out tenders for filling services in Denmark. In Italy and the Czech Republic, the obligations are included in regulations and decisions issued by the authorities. Only in the case of Poland, there is no publication of information regarding the obligations imposed on suppliers (the NRA publishes ex-post information in its annual report on the stockholding obligations).

Verification of the measure's implementation is only possible in Italy, where the entities tasked with stockholding (Snam and GSE) publish relevant information in their annual reports. In all other Member States, the market participants undertaking the stockholding obligation do not publish any information with respect to their level of stocks. Even if information of individual market participants is deemed commercially sensitive, there is also **a lack of information at aggregate level that would enable verification at least of the overall objectives being met**.

5.5.2.2 Non-discriminatory

In most Member States where obligations are directly imposed to suppliers / storage users (Czech Republic, Poland) or through tenders for filling requirements (Germany, Denmark), **there is no discrimination among market participants**.

Costs for implementing the measure are allocated differently to energy consumers, ranging from all the energy consumers to specific groups of gas consumers, depending on the cost recovery mechanism applied by each Member State:

- In Italy, the costs are distributed among all taxpayers, as the costs incurred by Snam and GSE, to procure and store gas for last resort filling, are financed from the State budget.
- In Germany, a neutrality charge is applied at all physical exits of the transmission system, including cross-border points, and it thus allocated to all users of the system, regardless of whether gas is finally delivered to consumers in Germany or other countries.
- In Poland, costs are paid by final gas consumers through regulated tariffs (for the supply of households and public utility entities) and competitive prices (for suppliers selling gas in the competitive market).
- In Denmark, an emergency tariff applies to all gas final customers, but higher tariffs are paid by protected customers.

In most Member States, **stored gas can be sold in the market without limitations**, provided that the stockholding obligations have been met.

5.5.2.3 Contribution to security of supply

The measure **contributed considerably to enhancing security of supply** in most Member States implementing it:

- In Poland, the mandatory stocks accounted for 42% of the storage capacity in 2022/23.
- In Denmark, the procured filling requirements and the gas volumes directly procured by the TSO filled 35% of the storage capacity in 2022.

- In Germany, the procured filling requirements (SSBO products) filled 34% of the country's large storage capacity in 2022.
- In Italy, the procured volumes in 2022 accounted for 16% of the storage capacity.

This measure does not appear to have an effect in increasing the withdrawal of gas from storage facilities during the winter period. On the contrary, the filling levels of the countries in Q2 of 2023 indicate that in several cases storage users maintained more gas in storage than in the past.

5.5.2.4 Cost efficiency

A **mechanism to ensure full cost recovery exists in the countries where a specific stakeholder** (market operator, supplier, TSO, state agency) is **designated to store gas for security of supply**. The mechanisms themselves vary, as described in Section 5.5.2.2. These mechanisms **ensure that the entities will collect sufficient revenues to cover their costs**, with cost recovery achieved through direct charges to network users and final customers, as well as support from State budgets.

In the Czech Republic and Poland, each supplier recovers its stockholding costs based on its own pricing strategy. Therefore, in these cases there is **no explicit and commonly used mechanism for recovering the obligated entities' costs**. There are also **risks associated with the full recovery of costs**, as changes in a supplier's market position may impact its ability to collect the required revenue. An exception to the above are the entities in Poland subject to regulated tariffs, where the costs for establishing and maintaining the reserves are considered as justified costs and included in tariffs.

Penalty schemes are in place in some Member States, to ensure storage filling is carried out in accordance with the set trajectories and targets. Storage users offering services for filling requirements in Germany and Denmark are charged with penalties in case they do not maintain the contracted quantities. A penalty is also imposed in Poland, while in the Czech Republic a UIOLI mechanism is applied in case it is foreseen that a storage user will not reach its filling targets.

5.5.2.5 Impact on gas market

Impacts of the measure in the gas market can differ, **depending on the mechanism through which the filling requirements are met by the entities**.

In principle, the market participants offering services for filling requirements would not need to procure considerable additional quantities of gas to provide their services, as it can be reasonably expected that the storing obligations of suppliers are for gas intended to be sold in any case to their customers. These services usually concern, to an extent, gas that the suppliers already have in storage or plan to store, even without the filling requirements. The timing to procure the gas to meet the filling requirements and the associated storage charges for any additional gas volumes to be stored, result in only limited additional costs for suppliers, which may raise the prices to its consumers only marginally. Therefore, **procuring services for filling requirements is unlikely to have a significant impact to the retail and wholesale markets**.

When the stockholding obligation is assigned **to stakeholders other than a supplier**, the procured and stored gas would eventually have to be sold back to the market, as otherwise it would constitute strategic reserves. Release of large gas volumes in a short timeframe, could potentially convey non-market-based signals and result to price fluctuations. For this reason, **mechanisms should be put in**

place to ensure that the gas stocks are sold to the market in an organized and non-distortive manner.

In most countries **no congestions have been reported** from the implementation of this measure.

5.5.3 Key findings

Obligations imposed on designated entities (point (c.2) of Article 6b(1))

- 5 Member States (CZ, DE, IT, DK, PL) are imposing obligations to entities of the gas sector, in order to meet the filling requirements.
- In most countries, the obligations lead the designated entities to storing gas themselves (market participants, TSO, state entity). In Germany and Denmark on the other hand, the designated entities (market area manager, TSO) have the option of procuring services for filling requirements from market participants through open tenders.
- The measure is clearly defined, and monitoring mechanisms are in place.
- The obligations imposed on the entities are transparent in most cases, however sufficient information to verify the measure's outcomes is only published in Italy.
- Costs are allocated to energy consumers differently, depending on the cost recovery mechanism applied in each country. The mechanisms in place ensure full cost recovery.
- The measure has had a substantial contribution to security of supply in Poland (42% of the storage capacity), Germany (34% of capacity), Denmark (35% of capacity) and Italy (20% of capacity).
- Impacts of the measure in the gas market can differ, depending on the mechanism applied.

5.6 Financial incentives for market participants (point (f) of Article 6b(1))

5.6.1 Implementation of measure

Financial incentives promoting utilization of storage capacity were introduced in 2022 in the Czech Republic, Italy and the Netherlands. In the Czech Republic and Italy storage users have the **possibility to sign contracts for differences with the TSO⁶⁰**, while **special subsidies are also provided** to storage users in Italy (all users) and the Netherlands (users bidding for the subsidy). The incentives in the Czech Republic⁶¹ and Italy had a 1-year duration and have already been terminated, while in the Netherlands the subsidy scheme has been extended to the year 2023/24.

It is noted that each incentive scheme in the Czech Republic and Italy are examined separately, as their mechanisms and impact differ.

⁶⁰ The storage user settles with the TSO the difference between the market price and a strike price defined in the contract. The strike price may for example be set by the regulator or may be the outcome of an auction for signing the CfDs. See [here](#) for further details on the application of CfDs as a measure.

⁶¹ The duration of the financial support of the Czech State to ČEZ is not clear, as commercial details on the relevant contract are not disclosed.

Table 31: Financial incentives for market participants – Timing of introduction

Timing of introduction	CZ-CfD ⁶²	CZ- ČEZ ⁶³	IT-Prem. ⁶⁴	IT-CfD ⁶⁵	NL
New measure in 2022/23	✓	✓	✓	✓	✓
Existing measure amended in 2022/23					
Existing measure not amended					
Temporary measure (2022/23 – 23/24)	✓		✓	✓	✓
Permanent measure		✓			

The subsidy schemes are accessible to all storage users and are managed by SSOs together with the TSO (in Czech Republic), solely the TSO (in Italy), or a State Agency (in the Netherlands). The Czech State is also providing financial support specifically to ČEZ, to facilitate its imports of LNG and their injection into the Czech storage facilities.

Table 32: Financial incentives for market participants – Entities implementing the measure

Entities implementing the measure	CZ-CfD	CZ- ČEZ	IT-Prem	IT-CfD	NL
Specific market participant(s)		✓			
All storage users with firm capacity	✓		✓	✓	✓
SSOs	✓				
TSO	✓		✓	✓	

All subsidies are financed through the State budget. Penalties are foreseen in Italy for storage users not meeting their storage filling obligations deriving from the subsidy schemes.

Table 33: Financial incentives for market participants – Financing mechanism

Financing mechanism	CZ-CfD	CZ- ČEZ	IT-Prem	IT-CfD	NL
Recovery of costs					
State Funds	✓	✓	✓	✓	✓
Incentives / penalties					
Subsidy		N/A	✓		✓
Contract for difference	✓		✓		
Penalty			✓	✓	

In the Czech Republic and the Netherlands, the incentive schemes are monitored by the Ministry responsible for energy. In Italy the NRA is monitoring the measure's implementation.

⁶² Offering of contracts for differences to storage users in the Czech Republic.

⁶³ Contract between the Czech State and ČEZ offering financial support for LNG imports.

⁶⁴ Offering of stock premium to storage users in Italy

⁶⁵ Offering of contracts for differences to storage users in Italy.

Table 34: Financial incentives for market participants – Entities monitoring the measure

Entities monitoring the measure	CZ-CfD	CZ- ČEZ	IT-Prem	IT-CfD	NL
Government					
Ministry responsible for energy	✓	✓			✓
NRA	✓		✓	✓	
Other State entity					✓

5.6.2 Analysis of measure’s contribution

The Table below provides an overview of the qualitative analysis performed on the contribution of the measure “Financial incentives for market participants” to the objectives of the Gas Storage Regulation.

Table 35: Financial incentives for market participants – Qualitative analysis

Criterion	Sub-criterion	CZ-CfD	CZ- ČEZ	IT-Prem	IT-CfD	NL	Avg.
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	●	◐	●	●	●	●
	Monitored and verified implementation	●	◐	●	●	●	●
	Transparent application and outcomes	◐	○	○	○	○	◐
	Involved parties are aware of their obligation and costs	●	○	◐	◐	◐	◐
Non-discriminatory	Non-discriminatory allocation of costs	●	●	●	●	●	●
	Non-discriminatory obligations set for involved parties	●	○	●	●	●	◐
	Access to the stored gas not limited to specific uses	●	-	●	●	●	●
Contribution to security of supply	Measure impact on storage filling levels	◐	-	●	○	◐	◐
	Measure increased share of stored gas in consumption	○	○	○	○	○	○
Cost estimation	Financing is defined and covers all required costs	●	-	●	●	●	●
	Effective collection of revenues to cover costs	●	●	●	●	●	●
	Incentives provided for applying the measure	N/A	-	N/A	N/A	N/A	N/A
Effects on the gas markets	Impact on gas markets and competition	●	-	●	●	●	●
	Impact on infrastructure congestion	●	●	●	●	●	●
	Impact on operation of organized markets	-	-	-	●	●	●

5.6.2.1 Clarity & transparency

The financial incentives offered to market participants are **described with clarity** in their regulatory frameworks.

In the case of the financial support provided by the Czech State to ČEZ, the **measure is not clearly described**, the **monitoring mechanism is not clearly defined**, and the obligations set are **not transparent and verifiable**.

A **monitoring mechanism is in place** in all countries (in the case of the Czech Republic for the CfDs). The monitoring authorities receive information from the entities offering the incentives, to ensure compliance with the storage filling obligations.

Some information related to the stockholding obligations related to the provision of the financial incentives are published by the entities offering the incentives, such as the contracted volumes in CfDs in the Czech Republic, the volumes for which the subsidy will be granted in the Netherlands and the obligations for receiving subsidies in Italy. On the other hand, the market participants do not publish any information of the gas stocks they have secured within the frame of the provided incentive. Only in the Czech Republic, the SSOs publish information on the aggregate gas volumes stored as a result of the contracts for differences. Consequently, **verification of the measure's results is possible only in one of the countries** offering such incentives.

5.6.2.2 *Non-discriminatory*

The financial incentives are offered in a non-discriminatory manner, as all market participants⁶⁶ with contracted storage capacity have access to the mechanisms offered in the Czech Republic, Italy, and the Netherlands. It is noted that in the Netherlands, the subsidy is offered only for booking of capacity at a single storage, in UGS Bergermeer, as only this storage is freely accessible by all market participants.

The costs associated with the provision of incentives are **allocated to all energy consumers**. The incentives are financed through State funding (Czech Republic, Netherlands) and therefore allocated to all taxpayers, or covered from amounts recovered from all energy consumers (Italy).

Provision of the incentives **does not limit how the gas stocks can be released in the market** by the respective market participants. Nevertheless, the filling obligations on specific dates linked to the incentive must be met.

Concerning the financial support by the Czech State to ČEZ, the measure is **targeted on a single market participant** with limited information on how it is applied.

5.6.2.3 *Contribution to security of supply*

The offered financial incentives had **varying contribution to the storage filling** of the Member States:

- **Contracts for differences** had limited (in the Czech Republic – 9% of the capacity) to **almost no impact** (in Italy – 1% of the capacity) in 2022.
- The **offering of a stock premium** to the Italian storage users **was very successful** in 2022, facilitating according to ARERA the filling of 43% of the storage capacity.

⁶⁶ It is noted that in the Netherlands, the eligibility rules include criteria that do not allow entities established outside the EU, with direct or indirect Russian State interests (of over 50%), to apply for the subsidy. However, considering the objective of these measures is to enhance security of supply, such eligibility rule can be considered reasonable, especially considering that 40% of the capacity at UGS Bergermeer has been booked by Gazprom and is currently used by other market participants on an interruptible basis.

- The **subsidy** offered in the Netherlands **had limited impact**, resulting in 2022 in subscribed capacity corresponding to 9% of the capacity.

According to the Czech NRA, the potential of the contribution of the incentive to ČEZ could be substantial. The maximum annual capacity booked by ČEZ at the LNG terminal amounts to 3 bcm, however information on the actual gas volumes which were procured and injected in the storages is not publicly available. The impact of this measure cannot be assessed.

The measure does not appear to have any effect in increasing the withdrawal of gas from storage facilities during the winter period. On the contrary, the filling levels of the countries in Q2 of 2023 indicate that in several cases storage users maintained more gas in storage than in the past.

5.6.2.4 Cost efficiency

In the Czech Republic and in Italy, the TSOs offering the financial incentives are **fully compensated for all associated costs, ensuring that their financial position remains unaffected**. In the Czech Republic, the payments by NET4GAS to storage users via the CfDs are offset through compensations from the State budget. In Italy, payments of Snam to users concerning the stock premium and CfDs are reimbursed from the Cassa per i Servizi Energetici e Ambientali. In the Netherlands, there is a well-defined mechanism for providing subsidies, and the **funding for these subsidies is sourced from the State budget**.

In all cases, the mechanisms in place ensure that the **necessary funds are collected to cover the associated costs**.

When it comes to the financial support provided by the Czech State to ČEZ, information concerning the costs reimbursed is not available. Nevertheless, these costs are recovered through allocations from the State budget.

5.6.2.5 Impact on gas market

The incentives offered aim to facilitate storage capacity booking and its utilization by market participants. There **does not appear to be a measurable impact of financial incentives on market competition and prices**. The financial support provided by the Czech State to ČEZ cannot be assessed as information on the measure is very limited.

5.6.3 Key findings

Financial incentives for market participants (point (f) of Article 6b(1))

- Financial incentives were introduced in 2022 for market participants in the Czech Republic (CfDs and financial support to ČEZ), Italy (CfDs and subsidies) and the Netherlands (subsidies), to promote the utilization of storage capacity. Measures in Italy and the Czech Republic applied only for year 2022/23.
- Limited information is publicly available concerning the support of the Czech State to ČEZ. All other incentives are linked with specific storage filling requirements for the storage user receiving it.
- The mechanisms providing the incentives are clearly described and monitored.
- Verification of the incentives' results is possible only for the CfDs offered the Czech Republic, for which the aggregate gas volumes stored are published.

- The financial incentives are offered to all market participants, and the costs are allocated to all taxpayers. The TSOs providing the incentives are reimbursed for all associated costs, ensuring their cost neutrality.
- Contracts for differences had limited (in the Czech Republic – 9% of the capacity) to almost no impact (in Italy – 1% of the capacity) in 2022. The offering of stock premium subsidy to the Italian storage users was very successful in 2022, facilitating the filling of 43% of the storage capacity. The subsidy offered in the Netherlands had limited impact in 2022 (9% of the capacity).
- There does not appear to be a measurable impact on market competition and prices.

5.7 Unused booked capacities (point (g) of Article 6b(1))

5.7.1 Implementation of measure

While congestion management procedures are in place for storage facilities in multiple Member States⁶⁷, the cases examined under this measure concern only the mechanisms aimed at incentivizing storage users to utilize their capacity with a view to fulfilling the filling obligations. In these instances, the UIOLI mechanisms in place have frequent monitoring procedures, enabling capacity to be swiftly released and allocated to other entities (either to other users or to entities with direct stockholding obligations).

The existing UIOLI mechanisms in Austria and Belgium were amended, and new mechanisms were introduced in 2022 in the Czech Republic and Germany. Additionally, an Oversubscription and Buy-Back (OSBB) mechanism recently (2nd half of 2023) started being applied in Spain. The measure is permanent in all countries.

Table 36: Unused booked capacities – Timing of introduction

Timing of introduction	AT	BE	CZ	DE	ES
New measure in 2022/23			✓	✓	✓
Existing measure amended in 2022/23	✓	✓			
Existing measure not amended					
Temporary measure (2022/23 – 23/24)					
Permanent measure	✓	✓	✓	✓	✓

Application of the congestion management procedure in place is always the responsibility of the SSO (in Spain the Technical System Manager), affecting the firm storage capacity that has been booked by the storage users.

Table 37: Unused booked capacities – Entities implementing the measure

Entities implementing the measure	AT	BE	CZ	DE	ES
All storage users with firm capacity	✓	✓	✓	✓	✓
SSOs / Technical System Manager	✓	✓	✓	✓	✓

* Measure prior to Gas Storage Regulation

The measures' costs are covered through the storage tariffs. Where a UIOLI mechanism applies, the SSO continues to receive storage charges, even when capacity is released. These charges are collected

⁶⁷ Congestion management procedures for storage facilities were in place in several Member States prior to the Gas Storage Regulation entered into force, such as the UIOLI mechanisms in Italy and the Netherlands. This analysis focuses specifically on Member States that either amended existing mechanisms or introduced new ones to support storage filling within the frame of meeting the targets of the Gas Storage Regulation.

from the user that surrendered its capacity and/or the user that booked the released capacity. The costs of the OSBB mechanism in Spain will also be covered via the storage tariff.

Overall, the UIOLI mechanism functions as an incentive for storage users to utilize their capacity. In Austria there is an explicit provision in the Law allowing for the SSO’s storage operation rights to be revoked, in case it fails to perform its duties, including the application of the UIOLI mechanism.

Table 38: Unused booked capacities – Financing mechanism

Financing mechanism	AT	BE	CZ	DE	ES
Recovery of costs					
Storage tariffs	✓	✓	✓	✓	✓
Incentives / penalties					
UIOLI	✓	✓	✓		✓
Revocation of licencing rights	✓				

In most countries, monitoring of the congestion management procedure is carried out by the NRA, as part of the overall monitoring of the SSO’s activities. In the Czech Republic and Germany, monitoring is carried out both by the Ministry responsible for energy and the NRA.

Table 39: Unused booked capacities – Entities monitoring the measure

Entities monitoring the measure	AT	BE	CZ	DE	ES
Ministry responsible for energy			✓	✓	
NRA	✓	✓	✓	✓	✓
Other State entity					

* Measure prior to Gas Storage Regulation

5.7.2 Analysis of measure’s contribution

The Table below provides an overview of the qualitative analysis performed on the contribution of the measure “Unused booked capacities” to the objectives of the Gas Storage Regulation.

Table 40: Unused booked capacities – Qualitative analysis

Criterion	Sub-criterion	AT	BE	CZ	DE	ES	Avg.
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	●	●	●	●	●	●
	Monitored and verified implementation	●	●	●	●	●	●
	Transparent application and outcomes	●	●	●	○	●	●
	Involved parties are aware of their obligation and costs	●	●	●	●	●	●
Non-discriminatory	Non-discriminatory allocation of costs	N/A	N/A	●	N/A	●	●
	Non-discriminatory obligations set for involved parties	●	●	●	●	●	●
	Access to the stored gas not limited to specific uses	N/A	N/A	N/A	●	N/A	●
Contribution to security of supply	Measure impact on storage filling levels	●	○	●	○	-	●
	Measure increased share of stored gas in consumption	N/A	○	○	○	-	○

Cost estimation	Financing is defined and covers all required costs	N/A	N/A	●	N/A	●	●
	Effective collection of revenues to cover costs	●	●	●	●	●	●
	Incentives provided for applying the measure	●	N/A	N/A	N/A	N/A	📊
Effects on the gas markets	Impact on gas markets and competition	●	-	●	-	-	●
	Impact on infrastructure congestion	●	-	●	-	-	●
	Impact on operation of organized markets	●	-	●	-	-	●

5.7.2.1 Clarity & transparency

The measure is **clearly described** in the regulatory framework of all Member States where the measure it used, in the primary legislation, regulations established by the NRA, or within the storage code.

The **NRAs are responsible for monitoring** the implementation of the congestion management procedures, as part of their mandate to monitor the activities of the SSOs. The clauses under which the UIOLI mechanism applies in Austria, Belgium, the Czech Republic and Germany **are fully transparent** and defined in the terms and conditions for the use of storage capacity published by the SSOs.

The **results of the UIOLI mechanism are verifiable**. In most Member States, the release of capacity from a storage user is announced, and this capacity is offered to other storage users. In Germany, however, booked and unused capacity is only made available to market area manager, THE, that is responsible for ensuring storage filling, and the SSOs are not required to publish any relevant information.

5.7.2.2 Non-discriminatory

The congestion management procedures are **implemented without discrimination**. The UIOLI clauses in Austria, Belgium, the Czech Republic and Germany apply to all storage users with booked capacity. The OSBB mechanism in Spain is also accessible for all storage users.

In most cases, **the UIOLI mechanism does not entail any additional costs for the SSO** applying it. This is because the SSO continues to receive the storage tariff either from the storage user having its capacity released, or the one that booked it. In the case of the Czech Republic, the use of UIOLI differs. When capacity is released, it is initially offered by the SSO to the market at zero reserve price, and if any capacity is still available, it may even be offered at a negative price. The user having surrendered its capacity continues to pay even if the capacity is booked by another user. However, any negative pricing of capacity (i.e., compensation to the storage user) would result in losses for the SSO, which are recovered through a mechanism funded from the State budget, and thus **allocated to all taxpayers**.

The **OSBB mechanism** implemented in Spain, on the other hand, **allocates costs only to gas consumers**, as Enagás GTS includes the costs in the storage tariff.

5.7.2.3 Contribution to security of supply

Application of the UIOLI mechanism in Austria and in the Czech Republic **contributed to meeting the filling targets**, as it allowed significant amounts of storage capacity to be released and allocated to other participants that utilized it:

- In Austria, 21 TWh (22% of the capacity), of booked but unused capacity by Gazprom Export was released. Part of the released capacity was used by ASGM to maintain its strategic reserves, and the rest was booked by other market participants.
- In the Czech Republic, in 2022, 4.2 TWh (11% of the capacity) of storage capacity was released and offered in the market. The majority of capacity (4 TWh) was released from Gazprom and the rest (0.2 TWh) from other storage users.

In the other countries, the measure had no impact yet. The UIOLI mechanism was not used in Belgium or Germany. The OSBB mechanism in Spain was put in place very recently in 2023, thus no impact can be assessed.

5.7.2.4 Cost efficiency

The implementation of the **UIOLI mechanism does not result in any additional costs** for the SSOs because they continue to receive storage tariffs from the users whose capacity is released, until another user books the released capacity. In the Czech Republic, the SSO is compensated for any losses offering capacity at negative prices (as discussed in Section 5.7.2.2) **through funds of the State budget**.

In Spain, any additional costs incurred by Enagás GTS for offering capacity through the OSBB mechanism are included in the calculation of the storage tariff, **ensuring that the necessary funds are collected** from the storage users.

In Austria, legislative provisions **ensure that the UIOLI mechanism is triggered by SSOs** when necessary and avoid that distortions are avoided. These provisions stipulate that an SSO may lose all its storage capacity rights in case it is not compliant with its obligations under the regulatory framework, including applying the UIOLI mechanism. This rule was used by E-Control in 2022, as GSA lost its SSO rights at Haidach UGS for failing to release booked but unused capacity of Gazprom Export at their storage facility.

5.7.2.5 Impact on gas market

The UIOLI mechanism has only been triggered in Austria and the Czech Republic. In both cases, the mechanism had a **positive impact on the storage market**. It facilitated the release of unused capacity into the market, making it available for booking by other market participants. It also contributed to relieving congestion in the gas storage system. This was achieved by addressing the capacity needs of market participants, allowing them to meet their filling targets and use the storage for commercial purposes.

5.7.3 Key findings

Unused booked capacities (point (g) of Article 6b(1))

- 5 Member States have in place storage capacity congestion management procedures linked with the filling obligations; Belgium, the Czech Republic, Germany and Austria apply a UIOLI mechanism, while Spain is applying an OBSS mechanism.
- The measure is clearly defined. NRAs monitor implementation.
- In most cases, the results of the UIOLI mechanism are verifiable, as the release of capacity from a storage user is announced, and this capacity is offered to other storage users.
- The UIOLI mechanism does not have additional costs for the SSO, as it will continue receiving the storage tariff either from the storage user surrendering its capacity, or the one that booked it. In the Czech Republic, however, the SSO is compensated for released capacity offered at negative reserve price through the State budget.
- Application of the UIOLI mechanism in Austria and in the Czech Republic contributed to meeting the filling targets. Booked and unused capacity was released from Gazprom and allocated to other users. In Austria 21 TWh (22% of capacity) was released, and in the Czech Republic 4.2 TWh (11% of capacity).
- The mechanism had a positive impact on the storage market, as it released unused capacity to the market, and contributed to relieving congestion in the gas storage system.

5.8 Strategic storage (point (h) of Article 6b(1))

5.8.1 Implementation of measure

Requiring one or more entities to establish strategic reserves in the underground storage facilities is one of the most commonly used measures among the Member States. Regardless of which entity(ies) are responsible for establishing the stocks, the strategic reserves are typically kept in storage for a long period of time and can be used in case of an emergency.

In 3 out of the 8 Member States applying the measure, the mechanism was already in place prior to the Gas Storage Regulation. In 3 other countries, the pre-existing measure was amended, to ensure that sufficient gas reserves were put in storage. Finally, in Austria and Germany new stockholding measures were implemented. The measures extend beyond 2024 in all countries.

Table 41: Strategic storage – Timing of introduction

Timing of introduction	AT	DE	ES	HU	LV	BG*	CZ*	IT*
New measure in 2022/23	✓	✓						
Existing measure amended in 2022/23			✓	✓	✓			
Existing measure not amended						✓	✓	✓
Temporary measure (2022/23 – 23/24)								
Permanent measure	✓	✓	✓	✓	✓	✓	✓	✓

* Measure prior to Gas Storage Regulation

The entities responsible for establishing the strategic reserves vary, depending on the approach taken by each Member State:

- In Hungary and the Czech Republic, a State entity is tasked with procuring and managing gas reserves. In Austria this task is assigned to an affiliate of the distribution area manager.

- In Germany the strategic reserves are part of the services for filling requirements, which are procured by the market area manager (THE may also draw from its own purchases in case of an emergency).
- In Spain, the stockholding responsibilities are imposed on the suppliers.
- The TSO is responsible for the strategic reserves in Bulgaria and the SSOs in Italy.
- Finally, in Latvia both the TSO and a state-owned gas company have been assigned to maintain stocks.

Table 42: Strategic storage – Entities implementing the measure

Entities implementing the measure	AT	DE	ES	HU	LV	BG*	CZ*	IT*
Suppliers of all final consumers			✓					
Specific market participant(s)					✓			
System users / BRPs		✓						
SSOs								✓
TSO					✓	✓		
Final consumers (own consumption)			✓					
Market operator		✓						
Agency/Entity	✓			✓			✓	

* Measure prior to Gas Storage Regulation

The financial mechanism applied to recover the costs for establishing and maintaining the strategic reserves vary. In some countries the costs are recovered directly from the final consumers, through the suppliers' end-user prices (Spain), or a special emergency levy (Hungary). In Austria, Latvia and the Czech Republic, the stockholding activities are funded through the State budget. In Bulgaria and Germany, funds are collected from the use of the network, through the transmission tariffs (excluding cross-border points) and neutrality charges (including cross-border points) respectively. Penalties apply in Germany, Spain and Hungary for entities not fulfilling their stockholding obligations.

Table 43: Strategic storage – Financing mechanism

Financing mechanism	AT	DE	ES	HU	LV	BG*	CZ*	IT*
Recovery of costs								
Paid by end-users			✓	✓				
State Funds	✓				✓		✓	
Storage tariffs								✓
Transmission tariffs (exc. Cross-border points)						✓		
Neutrality charges (incl. Cross-border points)		✓						
Incentives / penalties								
Penalty	N/A	✓	✓	✓	N/A	N/A	N/A	N/A
Imbalance charges			✓					

* Measure prior to Gas Storage Regulation

The authorities monitoring the measure are usually the entities in charge of ordering the use of the strategic reserves in case of an emergency.

Table 44: Strategic storage – Entities monitoring the measure

Entities monitoring the measure	AT	DE	ES	HU	LV	BG*	CZ*	IT*
Government	✓			✓				
Ministry responsible for energy	✓	✓		✓	✓		✓	✓
NRA	✓	✓		✓				
Other State entity(ies)	✓		✓					

* Measure prior to Gas Storage Regulation

5.8.2 Analysis of measure’s contribution

The Table below provides an overview of the qualitative analysis performed on the contribution of the measure “Strategic storage” to the objectives of the Gas Storage Regulation.

Table 45: Strategic storage – Qualitative analysis

Criterion	Sub-criterion	AT	DE	ES	HU	LV	BG*	CZ*	IT*	Avg.
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	●	●	●	●	●	◐	●	●	◐
	Monitored and verified implementation	●	●	●	●	●	-	●	●	●
	Transparent application and outcomes	●	◐	○	●	◐	○	◐	●	◐
	Involved parties are aware of their obligation and costs	●	◐	○	●	●	●	●	●	◐
Non-discriminatory	Non-discriminatory allocation of costs	●	◐	N/A	◐	●	◐	●	N/A	◐
	Non-discriminatory obligations set for involved parties	N/A	●	●	N/A	N/A	N/A	N/A	●	●
	Access to the stored gas not limited to specific uses	N/A	○	N/A	○	N/A	N/A	N/A	N/A	○
Contribution to security of supply	Measure impact on storage filling levels	●	○	●	●	◐	-	◐	●	◐
	Measure increased share of stored gas in consumption	N/A	N/A	N/A	○	○	N/A	N/A	N/A	○
Cost estimation	Financing is defined and covers all required costs	●	●	N/A	●	●	●	●	●	●
	Effective collection of revenues to cover costs	●	●	◐	●	●	●	●	●	◐
	Incentives provided for applying the measure	N/A	●	●	●	N/A	○	N/A	○	◐
Effects on the gas markets	Impact on gas markets and competition	●	●	●	◐	●	-	●	●	◐
	Impact on infrastructure congestion	○	●	●	●	-	-	●	●	◐
	Impact on operation of organized markets	-	-	-	●	-	-	●	●	●

* Measure prior to Gas Storage Regulation

5.8.2.1 *Clarity & transparency*

The measure is **clearly described** in the regulatory framework of all Member States implementing it, in the primary legislation and/or in decisions by the competent Ministry.

Each of these countries have put in place a **monitoring mechanism** to ensure that the strategic reserves are properly established and maintained. The authority responsible for monitoring and verification receives information, such as the reserves established, in most cases directly from the obligated entities.

The **obligations imposed on the entities are transparent in the majority of the countries** implementing the measure. Where the strategic reserves are a responsibility of a State Agency (Hungary, Czech Republic), the TSO (Bulgaria), the SSOs (Italy), or a State-owned supplier (Latvenergo), the obligations are published in the legislation or decisions by the authorities. In Germany, when the market area operator procures gas quantities and tenders for filling requirements from market participants, it publishes information on the related quantities and costs.

In Spain, however, the **stockholding obligations are not published**. Neither the suppliers tasked with establishing the stocks nor the authority setting the obligations (CORES) publish information on the gas targets. This lack of transparency with regards to the individual targets is reasonable, as the obligations are based on the sales of the suppliers, which can be considered as sensitive information. However, there is no information available even on an aggregate level; for the suppliers, this information is only available for the NRA, the Ministry and Enágas GTS.

Verification of the measure's result is possible only in the Member States that have assigned **the responsibility to State Agencies or system operators**. In these cases, the obligated entity published information on the established reserves.

On the other hand, in **countries where the responsibility for establishing strategic reserves has been assigned to market participants**, there is a lack of public information regarding the established reserves. Thus, in these cases the **verification of the measure's results is not possible**.

5.8.2.2 *Non-discriminatory*

In most Member States where obligations are imposed to market participants directly (Spain) or through tenders for filling requirements (Germany), **there is no discrimination among market participants**. Additionally, in Italy all SSOs have been tasked with establishing strategic reserves.

The allocation of costs to energy consumers varies per country, ranging from allocation to all consumers across the energy sector to allocation to specific groups of gas consumers. In Austria, the Czech Republic and Latvia the costs for establishing strategic reserves are distributed among all taxpayers, as these costs are covered through State funds. In Germany and Bulgaria, the costs are recovered through a neutrality charge and transmission tariffs respectively and are thus allocated to gas consumers. In Hungary a levy applies to all end-users excluding households (collected by the suppliers). In Latvia the costs are allocated to all taxpayers.

5.8.2.3 *Contribution to security of supply*

In several of the countries applied, the measure had a significant impact in increasing the storage filling levels:

- In Spain, the mandatory stocks established by the suppliers in 2022 correspond to 60% of the country's storage capacity.
- In Hungary the strategic stocks amounted to 30% of the total storage capacity.
- In Italy, the strategic reserve amounts to 28% of the storages' capacity.
- In Austria, the Austrian Strategic Storage Management established stocks corresponding to 22% of the storage capacity in 2022.

In other countries the measure was not so impactful. In the Czech Republic the stocks put in storage in 2022 corresponded to 6% of the capacity, in Latvia 9% of the capacity, while in Germany, the part of the SSBO products that remained in storage during the winter period of 2022/23 accounted for up to 7% of the country's storage capacity.

5.8.2.4 Cost efficiency

A **mechanism to ensure full cost recovery is in place in the countries that have assigned a single stakeholder** (market operator, supplier, TSO, State Agency) as the entity tasked with establishing and maintaining gas stocks. The mechanisms themselves vary. In Germany the neutrality charge imposed at the physical exits of the transmission system (including cross-border points) includes all costs incurred by the market area manager. In Hungary a special levy covering all cost is imposed to final consumers. In Bulgaria and Italy, the costs are recognized in the storage and transmission tariffs respectively. In Austria, the Czech Republic, and Latvia all costs are covered from State funds.

The mechanisms in place **ensure that the entities will collect sufficient revenues to cover their costs**, as recovery of these costs is carried out through direct charges to network users and final customers, as well as State funds.

In Spain, obligations are designated to market participants. In these cases, each supplier recovers its stockholding costs following its own pricing strategy, and thus there is **no explicit and commonly used mechanism for recovering the obligated entities' costs**. There are also **risks associated with the full recovery of costs**, as changes in the supplier's position in the market may impact how effectively it can collect the required revenue.

Penalties are in place in the countries where market participants are tasked with establishing strategic stocks, i.e., in Spain and in Germany. In both cases, financial penalties are imposed to market participants in case they do not comply with their filling targets.

5.8.2.5 Impact on gas market

In most Member States the strategic stockpiling obligation has been in force for many years, and the Gas Storage Regulation has not led to changes in its mechanism. In these cases (Bulgaria, Czech Republic, Spain, Italy), there have been **no significant new effects on the gas market**. In Hungary, however, although the measure has been in effect for over a decade, the recent **increase of the quantities of the strategic reserves affected the end-user energy costs**.

In Austria, strategic reserves, corresponding to 22% of the storage capacity, had to be established in 2022 as a result of the new measure. The required volumes were procured at high prices, resulting in an overall cost of 4 bil. € for ASGM. Release of the stored gas in the market could potentially distort

prices. However, the stocks will not be released at least until September 2025 (with potential extension up to 2026) **and will not have an impact on the market at least on the short-term.**

In Germany, the gas reserves are part of the SSBO service procured by THE. As these services are voluntary, and offered via open tenders, the mechanism does not distort competition. It can be assumed that the call-off quantities established by the storage users offering SSBO services to THE will store gas volumes intended for future sales to their customers, and therefore they would not need to procure large additional gas volumes in the market. The timing that the gas for the call-off quantities is procured, and the storage charges to keep it in storage from October to February, may result in limited additional costs for the supplier, that could raise the prices to its consumers. Based on the above rationale, **procuring services for filling requirements would have limited impact to the retail and wholesale markets.**

In Austria, establishment of the strategic reserves required using almost 21% of the country's storage capacity⁶⁸. This withheld capacity **may have led to contractual congestion** for the storage users seeking to book capacity. No issues of congestion have been reported in the other Member States maintaining strategic reserves.

5.8.3 Key findings

Strategic storage (point (h) of Article 6b(1))

- 8 Member States (AT, DE, ES, HU, LV, BG, CZ, IT) have tasked entities with establishing strategic reserves.
- Most of these countries had the measure in place prior to the Gas Storage Regulation and either amended it (increasing the strategic reserve volumes) or continued to apply it as is.
- The obligations have been set to market participants, market operator, TSO, SSOs, State Agencies and final consumers supplying their own gas.
- The measure is clearly defined, and monitoring mechanisms are in place.
- The obligations imposed are transparent in most countries. Verification of the outcomes is possible only in the countries having assigned the responsibility to State Agencies or system operators.
- The way costs are allocated to energy consumers varies, ranging from the consumers across the energy sector to specific groups of consumers.
- A mechanism to ensure full cost recovery is in place in the countries that have assigned a single stakeholder. In Spain, where the obligation is set to market participants, each supplier recovers the costs for stockholding from its customers, based on its own pricing strategy.
- In 2022, the measure had a significant impact in storage filling: in Spain (60% of capacity), in Hungary (30% of capacity), in Italy (28% of capacity) and in Austria (22% of capacity).
- In most Member States the strategic stockpiling obligation did not bring any new effects on the gas market. In Hungary, however, recent increase of the quantities of the strategic reserves affected the end-user energy costs.
- In Austria, gas reserves (20 TWh) were procured at high cost (4 bil. €) in 2022. However, these quantities will remain in storage for a prolonged period of time and are not expected to have an impact on the market at least on the short-term. On the other hand, withholding almost 22% of the storage capacity for the reserves may lead to congestion.

⁶⁸ 0.54 TWh of the strategic reserve is stored in a Slovakian storage facility directly connected to the Austria market area East.

5.9 Appointment of dedicated entity (point (i) of Article 6b(1))

5.9.1 Implementation of measure

Several Member States have appointed an entity to serve as a last resort solution in situations where the storage filling would be below the targeted levels, and the commercial use of the storages and the other measures in place prove not to be sufficient. All the Member States applying the measure established it in 2022, except in Spain, where it was put in place in 2023. In Italy, Croatia and the Netherlands the measure is temporary, and the stocks maintained by these entities are planned to be returned to the market by 2024. In contrast, in the rest of the countries implementing the measure, these entities will continue having the role of last resort service beyond 2024.

Table 46: Appointment of dedicated entity – Timing of introduction

Timing of introduction	DE	ES	FR	HR	IT	NL	SE
New measure in 2022/23	✓	✓	✓	✓	✓	✓	✓
Existing measure amended in 2022/23							
Existing measure not amended							
Temporary measure (2022/23 – 23/24)				✓	✓	✓	
Permanent measure	✓	✓	✓				✓

The entities which have been assigned the last resort task vary:

- In Germany the market area operator must procure gas quantities in case storage filling is not foreseen to be at the required level at the end of the injection period.
- In Italy this task has been assigned to the major TSO, Snam, and a State entity (Gestore dei Servizi Energetici - GSE).
- In Spain the Technical System Manager (Enagás GTS) must procure gas on behalf of a system user in case the latter is not meeting its stockholding obligations.
- In Sweden the stockholding responsibility has been assigned to Swedegas, that may decide to impose filling obligations⁶⁹ to balance administrators if the filling targets are not met.
- Other entities include the SSOs (France), a State entity (EBN – Netherlands) and in Croatia a State-owned major participant of the gas market (HEP).

Table 47: Appointment of dedicated entity – Entities implementing the measure

Entities implementing the measure	DE	ES	FR	HR	IT	NL	SE
Specific market participant(s)				✓			
System users / BRPs							✓
SSOs			✓				✓
Technical System Manager		✓			✓		
Market Operator	✓						
State Agency/Entity					✓	✓	

⁶⁹ The measure implemented in Sweden could also be considered as a measure under the “Obligations imposed on designated entities” (point (c2) of Article 6b(1)).

The financing mechanism of this measure depends on the appointed entity and specific arrangements in each Member State. The final consumers pay the costs in Sweden and in Croatia. State funding is used in Italy, the Netherlands and Croatia. In Germany and France, the costs of the appointed entities for procuring and storing gas quantities are recovered through special charges, imposed at all physical exit points including cross-border points (Germany), or directly to final energy consumers (France). In Spain, Enagás GTS recovers its costs from imbalance charges of the storage user on behalf of which the gas quantities were procured.

Table 48: Appointment of dedicated entity – Financing mechanism

Financing mechanism	DE	ES	FR	HR	IT	NL	SE
Recovery of costs							
Paid by end-users				✓			✓
State Funds				✓	✓	✓	
Levy to consumers			✓				
Neutrality charges (incl. Cross-border points)	✓						
Imbalance charges		✓					
Incentives / penalties							
Imbalance charges							✓

In most Member States, the monitoring of the measure's implementation is carried out by the Ministry responsible for energy, the NRA or both.

Table 49: Appointment of dedicated entity – Entities monitoring the measure

Entities monitoring the measure	DE	ES	FR	HR	IT	NL	SE
Ministry responsible for energy	✓			✓	✓	✓	
NRA	✓	✓	✓		✓		✓
Other State entity		✓					

5.9.2 Analysis of measure's contribution

The Table below provides an overview of the qualitative analysis performed on the contribution of the measure "Appointment of dedicated entity" to the objectives of the Gas Storage Regulation.

Table 50: Appointment of dedicated entity – Qualitative analysis

Criterion	Sub-criterion	DE	ES	FR	HR	IT	NL	SE	Avg.
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	●	●	●	●	●	●	●	●
	Monitored and verified implementation	●	◐	●	●	●	●	●	◐
	Transparent application and outcomes	●	○	-	○	●	●	○	◐
	Involved parties are aware of their obligation and costs	●	○	●	●	●	●	○	◐

Non-discriminatory	Non-discriminatory allocation of costs		N/A						N/A	
	Non-discriminatory obligations set for involved parties	N/A	N/A			N/A	N/A			
	Access to the stored gas not limited to specific uses						N/A			
Contribution to security of supply	Measure impact on storage filling levels									
	Measure increased share of stored gas in consumption									
Cost estimation	Financing is defined and covers all required costs							N/A		
	Effective collection of revenues to cover costs									
	Incentives provided for applying the measure						N/A			
Effects on the gas markets	Impact on gas markets and competition		-	-				-		
	Impact on infrastructure congestion		-	-			-	-		
	Impact on operation of organized markets		-	-				-		

The measures applied by Italy have also been examined under the measure “Obligations imposed on designated entities”.

5.9.2.1 Clarity & transparency

The measure is **described with clarity** in the regulatory framework of all Member States implementing it, in the primary legislation and/or in decisions by the competent Ministry.

In all Member States, there are **authorities monitoring implementation of the measure**, receiving information directly from the obligated entities. In Spain there is no monitoring mechanism in the legislation, nevertheless, Enagás GTS that has been tasked as the entity to provide last resort stocks, reports periodically to the NRA and the Ministry on the actions it has undertaken.

In Germany, Italy and the Netherlands, information concerning the filling obligations of designated entities (market area manager, TSO and state agencies), are published. These stakeholders publish information regarding the actions they taken to establish the necessary stocks. The **obligations and results of the measure are therefore both transparent and verifiable** in these cases.

In France, Spain and Sweden the dedicated entities must undertake ad hoc actions if the market participants are not expected to meet their storage filling obligations. Given the uncertain nature of these activities, no specific information is available regarding the entities’ stockholding requirements. However, even after such actions have been taken, it appears that none of the entities has a responsibility to publish relevant information. The complete information is available only to the entities involved and those monitoring the measure. Therefore, in these cases, **there is no public information on the application and results of the measure**.

5.9.2.2 *Non-discriminatory*

In most countries a single entity assumes the role of the dedicated entity, except for France where each SSO is responsible for its own storage facilities and in Italy where both Snam and GSE must establish stocks. There is therefore **no issue of discrimination in assigning the responsibility of last resort filling**. In Sweden, the TSO, Swedegas, allocates stockholding responsibilities to balance administrators in a non-discriminatory manner, based on their gas sales.

Allocation of costs is carried out either to all taxpayers or to final gas consumers. In Germany and France, the costs are undertaken by all gas consumers; in Germany a neutrality charge applies to all physical exits of the transmission system (including cross-border points), while in France costs are reimbursed through a levy directly charged to the final consumers. On the other hand, in the Netherlands and in Italy, costs incurred by EBN and Snam / GSE respectively are reimbursed using State funds. In Croatia, the State-owned supplier HEP recovers its costs only from protected customers, and any deficit is covered by the State budget.

The gas stocks established as a last resort to meet the filling targets can then be **sold to the market without any limitations**.

5.9.2.3 *Contribution to security of supply*

In 2022, contribution of the measure in security of supply **has been significant in the cases of Germany, Italy and Croatia:**

- In Germany, THE proceeded with the procurement of large gas quantities, 50 TWh, corresponding to 20% of the country's storage capacity.
- In Italy Snam and GSE jointly procured 34.9 TWh, amounting to 20% of the storage capacity.
- In Croatia HEP stored in 2022 2.7 TWh (56% of the capacity).
- **The impact was less considerable in the Netherlands**, where 12.2 TWh (9% of the capacity) were procured.

The measure had not been triggered yet in France or Spain, while in Sweden the mechanism is still under development and will enter into force in Q4 of 2023.

5.9.2.4 *Cost efficiency*

In the countries where specific entities (market operator, supplier, SSO, TSO, state agency) are designated to establish gas stocks (Germany, France, Spain, Croatia, Italy, Netherlands) **cost recovery mechanisms have been established**. The mechanisms are tailored to the specific circumstances of each country and vary, as described in Section 5.9.2.2.

The mechanisms in place **ensure that the entities will collect sufficient revenues to cover their costs**, as recovery of these costs is carried out through direct charges to network users and final customers, as well as State funds.

In Sweden, there is **no requirement for a cost recovery mechanism** to be in place, as Swedegas does not bear any costs of its own. The balance administrators with storage filling obligations recover their costs through the end-user prices charged to their customers, on the basis of their pricing strategy.

5.9.2.5 Impact on gas market

In most countries, there was no need to trigger the **last resort filling service** (France, Spain, Sweden), or the volumes established were **too small to effectively impact the gas market** (in the Netherlands the stocks secured in 2022 corresponded to 4% of the annual gas consumption).

In Croatia, gas volumes procured by HEP will be sold directly to suppliers of protected customers, with any deficit covered through the State budget, and thus not affecting market prices.

In Germany and Italy the **mechanisms were triggered during the injection period** to ensure that the large storage capacities of both countries would be filled. This decision was influenced by concerns that market participants may not seek to buy and store gas during that period, due to the largely negative summer-winter spreads. The mechanisms led to the procurement and storage of significant gas quantities, 50 TWh in Germany and 34.9 TWh in Italy, during a **period of very high gas prices** in Q3 2022⁷⁰. The resulting cost amounted to 8.7 bil. € in Germany and 6.5 bil. € in Italy. In Germany, it is very likely that the revenues from selling the stored quantities will not be enough to balance the costs incurred, and the neutrality charge applied to the system users could lead to an **increase of prices for final gas consumers**. In Italy, any unrecovered cost will be reimbursed from State funds, thus spreading the costs across all taxpayers.

The volumes withdrawn from the German and Italian market were only intended to be stored and sold at a later time, **potentially impacting the gas wholesale market**. The release of the stored gas in the market could **potentially distort prices, providing non-market based signals**, especially if the significant gas volumes are sold over a small timeframe. It should be noted that this is a hypothesis that cannot be conclusively supported by evidence, as not all gas in storage has been released yet. In addition, wholesale gas prices can be influenced by multiple factors, making it challenging to establish a cause-and-effect relationship between the implementation of the measure and its impact to the market.

5.9.3 Key findings

Appointment of dedicated entity (point (i) of Article 6b(1))

- 7 Member States (DE, ES, FR, HR, IT, NL, SE) have appointed an entity to act as a last resort solution in case the storage filling is expected to be below the targeted levels.
- In all Member States the measure was established in 2022 (except in Spain where it was established in 2023).
- The obligations have been set to stakeholders other than market participants (market operator, technical system manager, SSOs, state agencies, single supplier).
- The measure is clearly defined, and monitoring mechanisms are in place.
- In Germany, Italy and the Netherlands, publication of information allows the obligations and results of the measure to be both transparent and verifiable. In Spain and Sweden no reporting is foreseen in case the ad hoc mechanism is triggered.

⁷⁰ Indicatively, prices at TTF reached historically high levels during Q3 of 2022, including a week from 22 to 26 August 2022, when the average price was above €265/MWh ([Link](#)).

- Allocation of obligations is non-discriminatory. Obligated entities recover all their costs through the recovery mechanisms in place. Depending on the mechanism, the costs are allocated either to taxpayers or to gas consumers.
- The mechanism has been triggered only in Germany and Italy. In both cases large gas volumes were procured during a period of very high prices to avoid risks of market participants not filling the storages.
- Release of the stored gas in the market could potentially affect prices, by providing non-market based signals, especially if the whole quantity is sold over a small timeframe. End-user prices could also be impacted in Germany, where costs are recovered from gas consumers, if the revenues from gas sales cannot cover the very high costs at which gas was bought.

5.10 Discounts on storage tariffs (point (j) of Article 6b(1))

5.10.1 Implementation of measure

Discounts to storage charges, as measures to increase storage filling, are provided in Spain and Belgium. In Spain the discounts were offered temporarily, until 2024, but there is a possibility that their application is extended beyond this timeframe⁷¹.

Table 51: Discounts on storage tariffs – Timing of introduction

Timing of introduction	ES	BE*
New measure in 2022	✓	
Existing measure amended in 2022/23		
Existing measure not amended		✓
Temporary measure (2022/23 – 23/24)	✓	
Permanent measure		✓

* Measure prior to Gas Storage Regulation

The incentives are offered by the SSOs (in Spain the Technical System Manager) as discounts to the reserve price of the storage capacity auctions. In Spain the discounts are linked with specific storage filling requirements for the storage users that booked capacity for commercial purposes. In Belgium, the discounts incentivise booking of capacity that the users will then have to use in order to meet their stockholding obligations.

Table 52: Discounts on storage tariffs – Entities implementing the measure

Entities implementing the measure	ES	BE*
All storage users with firm capacity	✓	✓
SSOs / Technical System Manager	✓	✓

* Measure prior to Gas Storage Regulation

In Spain, any revenue deficit, due to the offered discount, is compensated through the State budget. In Belgium, potential under-recovery is reimbursed from the regularization account.

⁷¹ It is noted that in Italy discounts on storage products were offered (not linked to specific stockholding obligations), but the NRA does not consider these discounts as part of this measure. These were only set for a limited time to facilitate storage filling in a period of negative spreads, while the clearing price that storage users would pay could be higher than zero.

The measure itself is an incentive to promote storage filling, therefore no other incentives or penalties have been put in place.

Table 53: Discounts on storage tariffs – Financing mechanism

Financing mechanism	ES	BE*
Recovery of costs		
State Funds	✓	
Storage tariffs		✓
Incentives / penalties		
N/A		

* Measure prior to Gas Storage Regulation

In both countries the offering of discounts is monitored by the NRAs, as part of monitoring the storage capacity allocation.

Table 54: Discounts on storage tariffs – Entities monitoring the measure

Entities monitoring the measure	ES	BE*
Ministry responsible for energy		
NRA	✓	✓
Other State entity		

* Measure prior to Gas Storage Regulation

5.10.2 Analysis of measure’s contribution

The Table below provides an overview of the qualitative analysis performed on the contribution of the measure “Discounts on storage tariffs” to the objectives of the Gas Storage Regulation.

Table 55: Discounts on storage tariffs – Qualitative analysis

Criterion	Sub-criterion	ES	BE*	Avg.
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	●	●	●
	Monitored and verified implementation	●	●	●
	Transparent application and outcomes	◐	◐	◐
	Involved parties are aware of their obligation and costs	◐	◐	◐
Non-discriminatory	Non-discriminatory allocation of costs	●	◐	◐
	Non-discriminatory obligations set for involved parties	●	N/A	●
	Access to the stored gas not limited to specific uses	●	●	●
Contribution to security of supply	Measure impact on storage filling levels	N/A	N/A	N/A
	Measure increased share of stored gas in consumption	○	N/A	○
Cost estimation	Financing is defined and covers all required costs	●	●	●
	Effective collection of revenues to cover costs	●	●	●
	Incentives provided for applying the measure	●	●	●

Effects on the gas markets	Impact on gas markets and competition	●	●	●
	Impact on infrastructure congestion	○	●	◐
	Impact on operation of organized markets	●	●	●

* Measure prior to Gas Storage Regulation

5.10.2.1 Clarity & transparency

The provision of discounts is **described with clarity** in the regulatory framework of both Belgium and Spain, within the storage code and in an order by the Ministry responsible for energy respectively.

The **NRAs monitor** the reserve prices offered during auctions, with information submitted by the SSOs, within their overall monitoring of the storage capacity allocation.

The reserve price of the capacity auctions, the closing price, and the capacity allocated are published, providing **transparency on the results of the auctions**. However, storage users receiving the discounts do not publish any information with regards to meeting their storage filling obligations. Therefore, although the **results of offering capacity at discounts are transparent, their contribution to storage filling cannot be verified**.

5.10.2.2 Non-discriminatory

In both Belgium and Spain **allocation of obligations is non-discriminatory**. All market participants may receive the discounts, and are then assigned with the storage filling obligations, which are proportionate to the amount of capacity they have contracted.

Allocation of costs is carried out either to gas final consumers or to all taxpayers. In Belgium any under-recovery of revenues by the SSO are reimbursed via the regularization account, and thus charged to gas consumers via future tariffs. In Spain any deficit of Enagás GTS due to the discounting of sold capacity is covered through the State budget, thus the costs of the measure are allocated to all taxpayers.

There are **no limitations on how the storage users utilize the capacity they have booked**, as long as their filling obligations are met.

5.10.2.3 Contribution to security of supply

It is not possible to estimate the contribution of the offered discounts to increasing the storage filling levels. In Belgium, booking of discounted capacity to meet the filling targets cannot be distinguished from capacity used for commercial purposes. In Spain, the amount of capacity booked for commercial purposes as a result of the discount is not available.

5.10.2.4 Cost efficiency

The offering of storage capacity at reserve prices below the regulated tariff in Belgium, and at zero reserve price plus any premia in Spain, can result in revenue collection lower than the allowed revenue. To **reimburse the SSO for a potential revenue loss, a mechanism is in place** both in Belgium and in Spain. In the former, the losses of the SSO are covered by the regularization account, which may potentially have a future impact on the storage tariffs, while in Spain, State funds have been made available to the Ministry to be disbursed to Enagás GTS if required. Both mechanisms in place **ensure that the SSOs' deficit will be covered**.

In Belgium, as a result of providing storage capacity at a discount in 2022, Fluxys had to use 12 mil. € from the regularization account. In Spain, part of the State budget has been allocated to serve as compensation to Enagás GTS for losses due to the offered discounts, up to 21.6 mil. € for storage year 2022/23 and 23.2 mil. € for storage year 2023/24.

The **offered discount is directly or indirectly linked with the storage filling requirements** assigned to the storage users, **as an incentive**. In Spain, a storage user not meeting its obligations loses its discount and pays the standard storage tariff. In Belgium, a storage user failing to reach its targeted filling level is subject to financial penalties, as part of the overall procedure for tendering capacity.

5.10.2.5 Impact on gas market

The provision of **discounts to storage capacity tariffs does not have an effect on the gas wholesale and retail markets'** competition, operation and prices. Its purpose is to incentivize market participants to increase their booking and utilization of capacity to be used for commercial purposes. Therefore, there is no change on the market participants' behaviour in seeking to buy or sell gas in the market.

On the other hand, incentivizing market participants by **offering discounts may impact the availability of storage capacity and lead to congestion**. In Spain, with the incentives provided for yearly storage capacity, the market reacted showing more interest for using gas storage. As the capacity available for commercial use was limited, due to the large amount of capacity used by market participants to meet their stockholding obligations, increased demand in storage year 2023/24 resulted in premia, whereas booking in the previous years never exceeded 15% of the total offered capacity.

5.10.3 Key findings

Discounts on storage tariffs (point (j) of Article 6b(1))

- Discounts to storage capacity tariffs are offered in Belgium and Spain. The measure is pre-existing and permanent in the former, and new and temporary in the latter.
- The provision of discounts is described with clarity in the regulatory framework. Monitoring of the measure is carried out by the NRAs.
- The results of offering capacity at discounts are published, however information on the storage obligations of the benefited storage users is not published and thus cannot be verified.
- All market participants may participate and receive the discounts. The storage filling obligations linked to the discounts are allocated to storage users pro rata to the amount of capacity they have contracted.
- Cost recovery mechanisms are in place, ensuring that any under-recovery of revenues due to the discounts are reimbursed, via the regularization account (Belgium) or the State budget (Spain).
- Discounts do not have an effect on the gas wholesale and retail markets. However, the increased interest of market participants to book capacity in Spain led to congestion.

6 Difficulties and risks in implementing measures

6.1 Overview

This Section discusses the challenges and risks encountered by the parties involved in implementing the measures. These have been categorised into the following thematic areas:

- Financing difficulties for suppliers with stockholding obligations
- Impact on the flexibility of the gas system
- Stockholding by stakeholders other than market participants
- Offering of Contracts for Differences
- Capacity tenders supporting storage filling
- Efficient planning for interventions by designated entities
- Timing of measures' introduction
- Compliance of Storage System Operators with its obligations
- Fulfilment of storage targets by Member States without storage

These issues are analysed below, together with selected examples from Member States⁷², where available.

6.2 Risks and difficulties in implementing measures

Financing difficulties for suppliers with stockholding obligations

In certain Member States, gas suppliers faced financial challenges when requested to establish and maintain gas stocks in storage for security of supply purposes, over and above their commercial activities. During the summer of 2022, the suppliers with obligatory interim storage filling targets were exposed to very high gas prices (including all-time gas price peaks that exceeded 300 €/MWh in August 2022). Although the stockholding obligations were set based on historic gas sales, and thus related to the gas volumes that the suppliers would potentially sell to their customers, the timeframe of obligatory gas procurement was “administratively” driven by the filling targets rather than being optimized based on the suppliers' strategies. As a result, certain suppliers, particularly smaller ones with limited financial resources and hedging capacity, experienced cashflow constraints, faced liquidity risks and even risk of bankruptcy. The above adverse effects were exacerbated by the lack of compensation mechanisms, as gas suppliers had to subsequently recover their costs from their customers.

In order to mitigate the situation and reduce the costs for suppliers, NRAs in some cases provided incentives to storage users. The most common mechanism concerned offering storage products in auctions at zero reserve price. Subsidies were sometimes provided, linked to meeting the storage

⁷² The country experiences analysed in this Section are not exhaustive, but are case studies identified through information provided from the NRAs, and desktop analysis performed by VIS.

filling obligations. Contracts for differences were also offered in some cases, although market interest in such mechanisms was not always very high.

In **Austria**, the security of supply standard is applied more strictly from 2022 onwards. For smaller suppliers of protected customers, the obligation was hard to fulfil, due to a number of reasons. Short-term booking of storage capacity was expensive, and the products offered by SSOs did not fit the small suppliers' expectations. Moreover, suppliers without storage contracts considered themselves at a disadvantage compared to suppliers with storage contracts and lastly certain small gas suppliers lacked adequate knowledge of commercial operation of storages.

In the **Czech Republic**, some suppliers opted to limit their portfolios of protected customers to reduce their stockholding obligations and avoid the financial burden of having to secure gas volumes at periods of high prices, since over the past 2 years some suppliers became bankrupt.

In **Italy**, in the beginning of the Ukrainian crisis (2022) market participants were not able to buy storage capacity because of the very high gas prices and reverse winter summer spread. Therefore, the provision of some incentives was deemed appropriate (zero reserve price at auctions, not charging part of SSOs' operational costs).

In **Croatia**, due to the high gas prices at the beginning and throughout 2022, market participants were given the possibility to surrender their unused capacity to HEP, a State-owned supplier that had been designated to ensure storage filling levels.

Impact on the flexibility of the gas system

In certain cases, the increased obligations for storage filling have changed the role of storage facilities in the overall operation of the gas system and market. In countries where storages were traditionally used to provide flexibility to the market and the system, the obligation to store and maintain in storage for prolonged periods large gas quantities, can result in significantly reducing the flexibility that the storage can offer.

In **Spain and Portugal**, underground storages were used as "buffers" for LNG terminals, allowing the latter to receive shipments even at periods when the LNG storages were full. However, the additional obligations imposed to market participants resulted in over 80% of the storage capacity to be filled, most of which remained in use for the whole winter period. As a result, in both countries, LNG deliveries were hindered. Furthermore, in Spain the incentives provided for the commercial use of the remaining storage capacity resulted at its full booking, impacting the flexibility of the system.

In **Germany**, market participants have voiced concerns about the obligation to keep in storage part of the SSBO products, in the form of call-off quantities. They consider that the obligatory stocks impact the flexibility potential of storage. Also, activation of the SSBO product took place after the beginning of the storage year, making it difficult at a belated stage for market participants to plan for booking of capacity dedicated to meeting the filling requirements.

Stockholding by stakeholders other than market participants

In certain Member States the responsibility for establishing stocks rests with stakeholders other than market participants, such as market operators, TSOs or State Agencies. The release of the procured gas quantities by these stakeholders to the market at a later stage, is usually done in a way and time decided by the authorities. Although in principle the assignment of an entity to act as a last resort measure is beneficial, the practical implementation of last resort procurement in 2022 had difficulties. The assigned stakeholders were requested to establish large quantities of stocks within a short timeframe, in a period of very highly negative summer-winter spreads, and without recourse to price hedging, as suppliers could potentially do. It is expected that the revenues to be collected by the concerned stakeholders from selling the stored gas quantities will not suffice to cover in full the costs of initial purchases and storage. To cover this deficit, energy prices may be impacted.

In **Germany, Italy and Austria**, the stakeholders tasked with establishing gas stocks, THE (market area manager), Snam and GSE (TSO and State Agency) and ASGM (affiliate of the distribution area manager) were required to procure gas in Q3 2022 at very high prices, between 175 and 200 €/MWh. The aggregate cost of procuring the required gas volumes amounts to over 19 bil. €.

Part of the gas quantities have been sold back to the market, but at prices lower than those at which gas was initially procured. However, as a large share of the gas quantities still remain in storage, the overall cost of implementing this measure cannot be yet assessed.

Offering of Contracts for Differences

Both Italy and the Czech Republic designed an incentive mechanism based on contracts for differences, to provide incentives to market participants to buy and store gas at reduced exposure to market price fluctuations. In practice, however, the market showed limited interest in using CfDs. In the Czech Republic the quantities secured through CfDs accounted for 9% of the country's storage capacity, while in Italy they correspond to just 1% of the capacity.

In **Italy**, according to ARERA, the limited interest for CfDs can be due to the lack of experience for implementing this mechanism. Storage users preferred subsidy scheme linked with storage capacity (stock premium), on account of this mechanism being more straightforward to use.

In the **Czech Republic**, according to ERÚ, there were certain challenges observed when defining and implementing the CfDs:

- One challenge was that in one of the storage facilities more than 90% of the capacity was reserved by a single user. This situation made it practically impossible to conduct an auction to achieve the best market price for the provision of gas storage, due to a lack of bidding competition.
- Another challenge stemmed from the need to swiftly launch the incentive mechanism, so as to facilitate the earliest possible injection of gas into the storages. As a result, the auction process and the subsequent settlement mechanism involved complexities that impacted on its effectiveness. Although the TSO was tasked with organizing the auctions, its role was essentially to administer the auction results and pay out the funds to traders. The setup

and parameters of the auctions were determined by the Ministry of Industry and Trade and the auction process itself took place at the information systems of the SSOs.

Capacity tenders supporting storage filling

Auctions for gas storage capacity have traditionally been the most widely used mechanism for allocating capacity at gas storages with regulated access. However, the setup of the auctions does not necessarily support the needs of market participants that seek to book capacity for meeting their storage filling obligations, at very specific timeframes during the injection period. For example, short-term or monthly capacity may be offered at limited timeframes, or at periods when high gas prices do not provide incentives to market participants to contract capacity. This issue became more prominent in 2022, as the stockholding obligations in several countries were put in place after the commencement of the storage year.

In most cases, the above difficulties were addressed by adding more auction dates and by assigning higher priority to capacity booking for obligatory gas stocks over booking capacity for commercial purposes.

In the **Czech Republic**, one issue reported was that capacity auctions began during the summer of 2022 when gas prices were exceptionally high. As a result, market participants did not have the proper incentives and market signals to reserve storage capacity. The situation improved when the booked but unused capacity was offered in the market at a time that gas prices had decreased.

In **Italy**, where storage capacity has been allocated via auctions since 2011, in order to facilitate gas injections, the frequency of the auctions carried out for products with monthly injection was increased for 2022.

In **France**, an auction mechanism is in place since 2018, and the NRA introduced more frequent auctions.

In **Portugal**, the capacity for security of supply purposes is allocated to market participants by priority (vs capacity for stocks to be used for commercial purposes), through tenders which have a specific allocation time window.

Efficient planning for interventions by designated entities

Entities designated to meet the storage filling targets should decide on the actions to be undertaken (e.g., how much gas volumes to be procured, how much services for storage filling to be requested) and their timing. Proper planning is critical, to achieve the targets in the most efficient manner. For example, offering subsidies for storing a large amount of gas could result in oversubsidizing market participants which intended to store gas anyway. Another example is that a dedicated entity should proceed with procuring gas volumes as a last resort for storage filling, even at high prices, only if storage capacity would not be filled in a market-based manner by suppliers.

In **Germany**, to reach the filling targets, THE may either procure SSBO products, or buy and store gas on its own. The latter, however, is not considered specifically as a last resort option, as no merit order is foreseen. In 2022, THE proceeded with the procurement of large gas quantities, at high

costs, even though some market participants considered that tendering additional SSBO products could increase storage filling with a substantially lower cost.

In **Denmark**, the tenders for filling requirements carried out by Energinet did not manage to attract sufficient market interest. On average, around 33% of the quantities the TSO requested were awarded in the 4 tenders carried out in 2022. In the last tender of the year, no capacity was awarded, as market participants asked for high prices for their products and, as a result, the designated entity did not proceed with buying any gas at all.

Timing of measures' introduction

The Gas Storage Regulation entered into force in July 2022, which was the middle of the injection period of the storage year 2022/23. Even though most Member States already had commenced designing and implementing measures at that time, several measures were put in force after the storage year had started. As a result, in some cases, the authorities had very limited time to formulate and implement the measures, and the market participants were not given sufficient time to plan their activities.

In **Spain**, the Royal Decree that increased the pre-existing stockholding obligation of gas suppliers was approved in the middle of the underground storage gas year.

In **Germany**, the implementation of the measures took place late in the injection period which resulted in procuring gas at high prices and not exhausting the possibility of fully employing market-based measures.

In **Italy**, ARERA had very limited time to formulate the two financial incentives offered to storage users, i.e., the provision of a premium and the establishment of CfDs.

Compliance of Storage System Operators with its obligations

In several Member States, SSOs play a critical role in ensuring the implementation of the storage filling requirements, not only in terms of monitoring and reporting the filling levels, but also by taking actions to release booked but unused capacity to other storage users. In case, however, the SSO does not perform its tasks, the NRA should be ready to impose sanctions and carry out swift actions to ensure release of unused capacity in time to allow market participants to meet their filling targets.

In **Austria**, provisions are in place in the legislation, foreseeing that an operator may lose its rights, and thus all of its capacity, if it does not perform its actions in accordance with the Law. E-Control had to use this clause, in order to revoke the rights of GSA, and assign its capacity at Haidach UGS to other SSOs, so that the booked but unused capacity of Gazprom Export at the facility could then be released to other storage users.

Fulfilment of storage targets by Member States without storage

Member States without storage rely on the capacity in neighbouring countries to meet their obligations stemming from the Gas Storage Regulation. There may, however, be constraints in the

availability of capacity at interconnections and neighbouring storages, or even obstacles for sourcing gas quantities. These constraints may not allow the countries to fully meet their stockholding targets.

In **Estonia**, the entity designated to establish emergency reserves faced difficulties in securing the gas quantities required in 2022. As a result, the entity had to conduct three procurements to secure the quantity of gas prescribed by the Government.

In 2022, **Slovenia**'s gas suppliers failed to meet the 15% target (reached 11% instead) as they faced limited available storage capacity in neighbouring Member States.

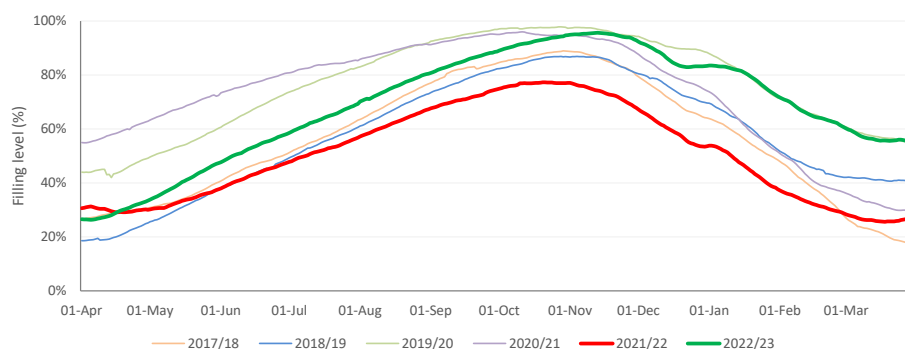
Greece faces constraints in meeting its storage obligations for 2023. Annual capacity at the interconnection with Italy is already reserved, and storage capacity both in Italy and Bulgaria is fully booked.

7 Key findings and conclusions

7.1 Impact of measures on storage filling

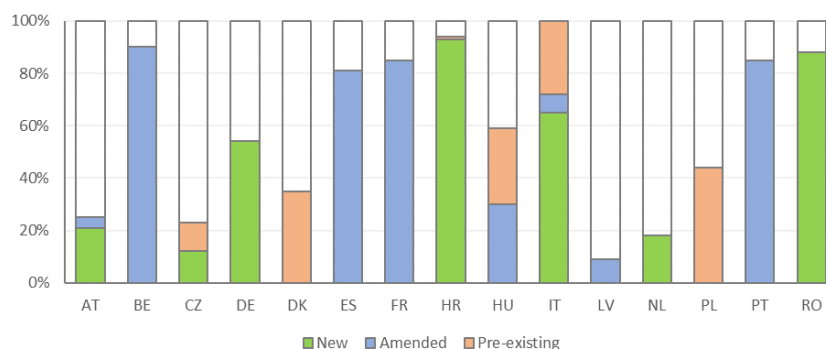
In the storage year 2022/23, all Member States with underground gas storage facilities succeeded in meeting the obligations set out in the Gas Storage Regulation (Figure 10). **This can be attributed, to a large extent, to the measures taken by the Member States which ensured the establishment of gas stocks in the storage facilities.**

Figure 10: Storage filling in EU facilities from storage year 2017/18 to 2022/23



In several Member States, measures already in place before the Gas Storage Regulation continued to apply. Some measures were amended, to enhance their effectiveness, while other measures continued to be used without changes in their mechanism of implementation. **New measures were also introduced by Member States to further increase storage filling.** Figure 11 presents the share of the Member States' storage capacity that was filled in 2022 with gas volumes established as a result of implementing these measures. Other measures, that seek to facilitate the booking and utilization of storage capacity (discounts on storage tariffs, increased frequency of tenders, UIOLI mechanisms), without assigning direct stockholding obligations to entities, are not included in the Figure.

Figure 11: Share of storage capacity in each Member State filled with gas volumes established due to the measures, in 2022⁷³



Measures that were put in place in 2022, and measures amended to meet the targets set by the Gas Storage Regulation appear to have had a strong contribution to storage filling. Indicatively, the

⁷³ For Belgium and France, the values presented correspond to the national obligations for minimum storage filling on November 1st, assigned to storage users. In the Czech Republic, the values presented do not include the stockholding obligations assigned to suppliers of protected customers (old measure), which could not be estimated. Bulgaria, Sweden, and Slovakia are not displayed as the available information was not sufficient to estimate the impact of the national measures.

increase of stockholding obligations by market participants in Spain and Portugal, and the new requirement in Romania for gas suppliers to establish stocks, led to gas storage filling above 80% of the countries' storage capacity.

7.2 Measures' contribution to the objectives of the Gas Storage Regulation

Analysis of how measures were implemented in the Member States can lead to conclusions concerning the contribution of these measures to the objectives of the Gas Storage Regulation. This analysis assesses how well the adopted measures fare in respect to the criteria of clarity, verifiability and transparency, non-discrimination, contribution to security of supply, effectiveness to recover costs, and impact to the functioning of gas markets. In presenting the results of the assessment for each measure, the average qualitative ratings, discussed in Section 5, are used.

Table 56 presents the assessment results of each measure's standing against the criteria of clarity, verifiability and transparency. It can be seen that **the measures are clearly described in the legal and regulatory framework**, where the obligations of each entity, the monitoring responsibilities, cost recovery mechanisms, incentives in place, etc. are sufficiently detailed. In each Member State, **one or more authorities have undertaken monitoring of the measures' implementation**.

Transparency and verifiability of the measures' outcomes are not always ensured, as the stockholding obligations and the actual gas stocks established are in many cases not published. This is observed mainly where storage filling responsibilities are assigned to market participants, whose obligations are usually determined based on sensitive commercial information such as their gas sales or booked capacity. Nevertheless, even with this constraint, the **transparency and verifiability of the measure and its outcomes could be enhanced if information was published by the monitoring authorities** at least on an aggregate level, for all market participants together.

Table 56: Clarity, verifiability and transparency of measures – average ratings for all Member States⁷⁴

Sub-criterion	Clearly defined measure and application approach	Monitored and verified implementation	Transparent application and outcomes	Involved parties are aware of their obligation and costs
a. Minimum volume in gas storage				
b. Tender of capacities				
c1. Balancing stock managed by TSO				
c2. Obligations imposed on designated entities				
f. Financial incentives for market participants				
g. Unused booked capacities				
h. Strategic storage				
i. Appointment of dedicated entity				
j. Discounts on storage tariffs				

⁷⁴ ●: Max. contribution / ○: Min. contribution / "N/A": criterion not applicable for the specific measure

Table 57 presents the assessment results on the measures' standing against the criterion of non-discrimination. In most cases, no issues of discrimination were identified. **Obligations are typically allocated to the different parties fairly on the basis of clear parameters**, such as the entities' gas sales / consumption, or the capacity they have booked at the storages. In only very few cases, responsibilities are assigned to a single market participant, usually a State-owned supplier or universal service provider supplying households and other protected customers.

Costs for implementing the measures are usually recovered from gas consumers or all energy consumers. In a few cases, however, costs are allocated to specific customer groups (e.g., to protected customers). It should be stressed that where storage filling is assigned to suppliers operating in competitive markets, each supplier recovers the relevant costs in accordance with its own pricing strategy in the face of competition. Thus, in such cases it is not possible to assess how costs of the measure are allocated to final consumers and whether there is discrimination in terms of the allocation of storage filling costs to customers.

No limitations to the accessibility of stored gas were identified. The entities are free to withdraw and sell the gas they have stored in the market, as long as they meet their respective filling targets on the prescribed dates. The lack of restrictions does not apply however to strategic reserves, which have to be held in storage for a prolonged period, ranging from the whole winter period to multiple years.

Table 57: Non-discrimination – average ratings for all Member States

Sub-criterion	Non-discriminatory allocation of costs	Non-discriminatory obligations set for involved parties	Access to the stored gas not limited to specific uses
a. Minimum volume in gas storage			
b. Tender of capacities			
c1. Balancing stock managed by TSO			
c2. Obligations imposed on designated entities			
f. Financial incentives for market participants			
g. Unused booked capacities			
h. Strategic storage			
i. Appointment of dedicated entity			
j. Discounts on storage tariffs			

Table 58 presents the assessment results on the measures' standing against the criterion of contribution to security of supply. Based on the information available on the gas quantities secured from the implementation of each measure in 2022, the following conclusions can be drawn:

- **The largest impact** on storage filling was achieved by setting minimum **volume obligations to market participants**, and imposing **obligations to designated entities**.
- **Storage filling of last resort** was triggered only in few countries, and in these cases, it had a major contribution to ensuring that the storages were full in the beginning of winter.

- Although establishment of strategic reserves was used as a measure by several Member States, it had a lesser impact on storage filling, as in some cases these strategic reserves accounted for a small part of the overall capacity of the concerned country.
- The **impact of the UIOLI mechanism is notable**, as its application led to the release of capacity, which was then used to fill the storage facilities.

Table 58: Contribution to security of supply – average ratings for all Member States



































Sub-criterion	Measure increased storage filling levels	Measure increased share of stored gas in consumption
a. Minimum volume in gas storage		
b. Tender of capacities		
c1. Balancing stock managed by TSO		
c2. Obligations imposed on designated entities		
f. Financial incentives for market participants		
g. Unused booked capacities		
h. Strategic storage		
i. Appointment of dedicated entity		
j. Discounts on storage tariffs	N/A	

Table 59 presents the assessment results on the measures' standing against the criterion of effectiveness in cost recovery. **Entities other than market participants** (market operators, TSOs, SSOs, State agencies, etc.) are **reimbursed in full** for all the expenses incurred to implement the measures, **through tariffs, levies or State financing**. On the other hand, in the cases where **suppliers are obligated to establish gas stocks, no administrative cost recovery mechanism is in place**, and thus the suppliers **carry the potential risk of not being able to collect the necessary funds in full** (e.g., in case their market share decreases or there are issues with collecting payments from the customers).

Incentive and penalty mechanisms are in place mainly for the **measures that assign storage filling responsibilities to market participants**. Where responsibilities are assigned to stakeholders other than market participants, no explicit mechanisms have been applied, based on the expectation that these organizations will fulfil their tasks without the need for incentives.

Table 59: Cost recovery – average ratings for all Member States

Sub-criterion	Financing is defined and covers all required costs	Effective collection of revenues to cover costs	Incentives provided for applying the measure
a. Minimum volume in gas storage			
b. Tender of capacities			
c1. Balancing stock managed by TSO			
c2. Obligations imposed on designated entities			
f. Financial incentives for market participants			N/A
g. Unused booked capacities			

h. Strategic storage			
i. Appointment of dedicated entity			
j. Discounts on storage tariffs			

Table 60 presents the assessment results on the measures' standing against the criterion of gas market impact. Measures that include obligations on market participants can affect market functioning. The most notable potential impact is that **the relevant costs of suppliers** (for example due to booking short-term storage capacity or procuring gas volumes at high gas prices), **would be passed on to their customers**, thus increasing retail prices.

Congestion at the storage facilities was observed only in a few cases, where the largest part of the storage capacity had to be booked by market participants to meet their stockholding obligations.

Wholesale gas prices can be impacted by multiple factors, making it **difficult to establish a direct cause-and-effect link between the implementation of measures and their impact on the gas market**. However, some of the measures implemented during the summer 2022 **may have contributed to push wholesale gas prices** to high-records in 2022, although it is difficult to assess to what extent. This price surge was driven by the intensification of intra-EU price competition for short-term gas procurement at EU hubs, followed by gas injection into storages. To mitigate any subsequent market effects, where large gas volumes were purchased by entities in 2022 as a last resort to fill the storages, the resulting **gas stocks ought to be released back to the market using mechanisms that avoid distorting wholesale prices**.

Table 60: Effects on gas market – average ratings for all Member States

Sub-criterion	Impact on gas markets and competition	Impact on infrastructure congestion	Impact on operation of organized markets
a. Minimum volume in gas storage			
b. Tender of capacities			
c1. Balancing stock managed by TSO			
c2. Obligations imposed on designated entities			
f. Financial incentives for market participants			
g. Unused booked capacities			
h. Strategic storage			
i. Appointment of dedicated entity			
j. Discounts on storage tariffs			

7.3 Implementation of national measures

The role of market participants in ensuring that the storage filling targets are met, depends on the national measures applied in each Member State. **Market participants may be obligated to establish mandatory stocks** or may be allowed to **take decisions on how much gas ought to be stored, based on market considerations and their interest**. Often, market participants are incentivized to establish

stocks through subsidy mechanisms and tariff discounts. **Other stakeholders**, including market operators, TSOs, SSOs, and State Agencies, **may be obligated to fill part of the storage, or even to provide storage filling of last resort, in cases where the market interest for storage filling is not enough**. Depending on the role foreseen for market participants and other stakeholders, the Member States have assigned different combinations of stockholding responsibilities (Table 61):

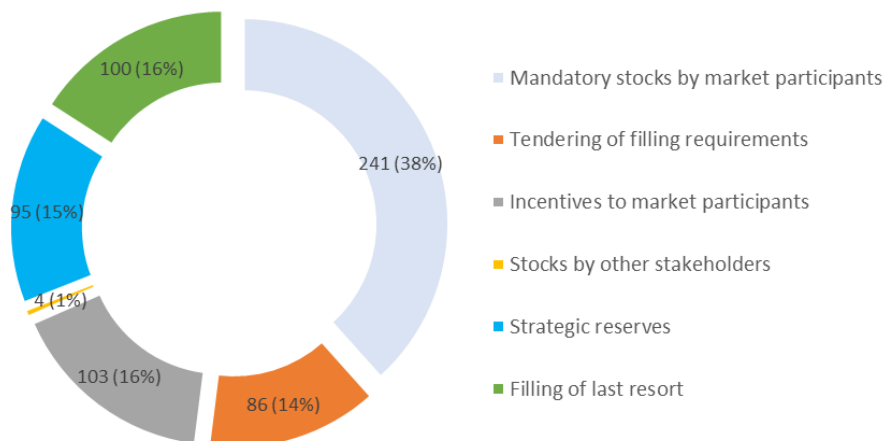
- Obligation on market participants to establish mandatory stocks, without responsibilities assigned to other stakeholders (in Belgium, Poland, Portugal, Romania, and Slovakia).
- Obligation on market participants to establish mandatory stocks, and additional storage filling obligations to other stakeholders, including strategic reserves (in Austria, Bulgaria, the Czech Republic, and Hungary).
- Obligation on market participants to establish mandatory stocks, together with entities assigned to provide filling of last resort (in Croatia, France and Spain).
- Voluntary storage filling by market participants, together with entities assigned to provide filling of last resort (in Germany, Italy, the Netherlands, and Sweden).
- Voluntary storage filling by market participants and additional storage filling obligations to other stakeholders (in Denmark and Latvia).

Table 61: Responsibilities for stockholding in each Member State

	Mandatory stocks by market participants	Voluntary storage filling by market participants	Storage filling by entities except market participants	Filling of last resort
AT	✓		✓	
BE	✓			
BG	✓		✓	
CZ	✓		✓	
DE		✓		✓
DK		✓	✓	
ES	✓			✓
FR	✓			✓
HR	✓			✓
HU	✓		✓	
IT		✓	✓	✓
LV		✓	✓	
NL		✓		✓
PL	✓			
PT	✓			
RO	✓			
SE		✓		✓
SK	✓			

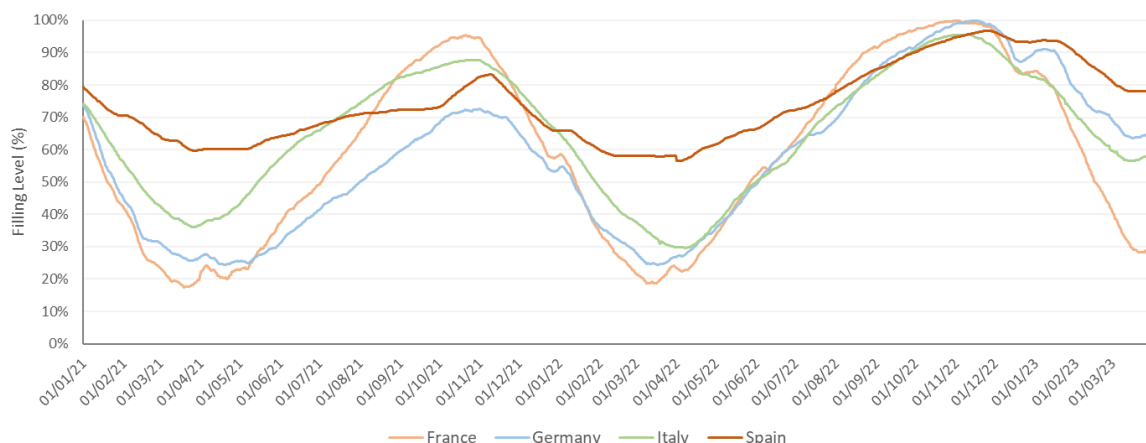
In total, **over 630 TWh were stored in the Member States’ underground facilities in 2022 as a result of the measures** (Figure 12). This corresponds to **53% of the aggregate storage capacity in the EU**. Around 70% of these gas volumes were mandatory stocks secured by market participants, strategic reserves, and storage filling of last resort. The remaining 30% was attained by providing incentives to market participants (mainly in Italy) and tendering filling requirements (primarily in Germany).

Figure 12: Gas volumes stored as a result of measures in 2022



Conclusions on how the role of market participants in establishing gas stocks can affect storage filling can be drawn by observing the use of measures by the largest gas consumers in the EU, France, Germany, Italy and Spain. As shown in Figure 13, France, Germany and Italy had similar filling levels in the beginning of the 2022/23 storage year.

Figure 13: Evolution of filling levels in France, Germany, Italy and Spain since 2021



In France and Spain, the market participants were obligated to establish gas stocks, while in Germany and Italy use of storages by the market players was voluntary:

- In France the storage users were obligated to fill their booked capacity at least up to 85% on November 1st, 2022. As an incentive, storage capacity has been offered since several years now at a zero reserve price. A safety net mechanism was introduced to ensure that users were compliant with the targets. The SSOs, Storengy and Teréga, were tasked with providing filling of last resort, if required. Storages were 100% full on November 1st, 2022, without the need to activate the last resort mechanism.
- In Spain market participants were required to store gas corresponding to 80% of the storage capacity. As an incentive, storage capacity was offered at a zero reserve price for 25% of the obligation. Additional incentives were offered for the commercial use of the remaining storage capacity. The technical system manager, Enagás GTS, was tasked with providing filling of last resort, if required. Storages were 95% full on November 1st, 2022, without the need to activate the last resort mechanism.

- In Germany, the market area manager, THE, procured storage filling requirements (SSBO products) from market participants willing to undertake the obligation of establishing stocks, at a fee. The SSBO products procured through 2 tenders, carried out by THE in May 2022, corresponded to 34% of the storage capacity. To ensure storage filling, 50 TWh had to be procured as a last resort, at an average price of 200 €/MWh.
- In Italy, market participants were incentivized to book and store gas on the basis of discounts to storage charges and subsidies. This resulted in a storage filling of 44%. Furthermore, the SSOs have been maintaining strategic reserves accounting for 28% of the storage capacity. To ensure storage filling, Snam and GSE had to procure 35 TWh of gas, as a last resort, at an average price of 187 €/MWh.

In France and Spain, the mandatory requirements assigned to market participants drove storage filling, despite the negative summer-winter price spreads during the injection period. Incentives were provided to reduce the overall costs for storage users, but penalties were also in place for users not meeting their targets. In Germany and Italy, **the market had limited interest to use storages due to the challenging conditions, and the offered incentives (payments for storage filling and subsidies) were insufficient**. As a result, the need arose in both countries to procure large quantities of last resort gas (85 TWh) at high costs (187 – 200 €/MWh).

These cases highlight the importance of market signals to the effectiveness of the measures applied for storage filling. When **gas is available at very negative summer-winter price spreads**, as in 2022, with suppliers having no incentive to store gas, **assigning mandatory requirements to suppliers enhances confidence that filling targets can be achieved**. On the other hand, **under normal market conditions, continuing to set stockholding obligations to all suppliers can pose risks**. Retail prices may be affected, as suppliers will be called to pay storage charges, regardless of whether they commercially intended to store gas, and the procurement of gas for the winter period will have to take place at specific time windows, to match the storage filling requirements. Furthermore, storages will offer limited flexibility to the system, as their use will be driven by the filling obligations. These aspects should be taken into account when designing a permanent measure that will continue to apply at least until the end of the Gas Storage Regulation's validity.

Regardless of whether market participants undertake a mandatory or voluntary role in storage filling, **the appointment of an entity to provide storage filling of last resort is an important fallback option**. Although triggering such a mechanism will most likely result in higher costs than normal procurement of gas, it can nevertheless provide assurance that security of supply will be safeguarded, even at a cost. Drawing from the experience of these mechanisms in 2022, for **a last resort mechanism** to be effective, it **must be combined with planning of volume requirements, mechanisms to reduce market risk (e.g., hedging) and a clear strategy on how volumes purchased for storage will later be released in the market**.

As a follow-up to this Study, the Council of European Energy Regulators (CEER) is planning a follow-up study. This CEER study will review agreements and burden-sharing mechanism between Member States that have storage facilities and the ones that do not have them, and identify best practices and propose recommendations to design storage filling obligations with the aim to enhance their effectiveness and efficiency.

Annex 1: Abbreviated titles of Gas Storage Regulation's typologies of measures

Point #	Typology of measure in Article 6b(1)	Abbreviated title
(a)	Requiring gas suppliers to store minimum volumes of gas in storage facilities, including in underground gas storage facilities and/or in LNG storage facilities, those volumes to be determined on the basis of the amount of gas supplied by gas suppliers to protected customers	Minimum volume in gas storage
(b)	Requiring storage system operators to tender their capacities to market participants	Tender of capacities
(c1)	Requiring transmission system operators or entities designated by the Member State to purchase and manage balancing stock exclusively for carrying out their functions as transmission system operators	Balancing stock managed by TSO
(c2)	Imposing an obligation on other designated entities for the purpose of safeguarding the security of gas supply in the case of an emergency	Obligations imposed on designated entities
(d)	Using coordinated instruments, such as platforms for the purchase of LNG, with other Member States to maximise the utilisation of LNG and to reduce infrastructure and regulatory barriers to the shared use of LNG to fill underground gas storage facilities	Coordinated instruments
(e)	Using voluntary mechanisms for the joint procurement of natural gas	Voluntary joint procurement mechanisms
(f)	Providing financial incentives for market participants, including for storage system operators, such as contracts for difference, or providing compensation to market participants for the shortfall in revenues or for costs incurred by them as a result of obligations on market participants, including storage system operators which cannot be covered by revenue	Financial incentives for market participants
(g)	Requiring storage capacity holders to use or release unused booked capacities, while still obliging the storage capacity holder not using the storage capacity to pay the agreed price for the whole term of the storage contract	Unused booked capacities
(h)	Adopting effective instruments for the purchase and management of strategic storage by public or private entities	Strategic storage
(i)	Appointing a dedicated entity tasked with meeting the filling target in the event that the filling target would not otherwise be met	Appointment of dedicated entity
(j)	Providing discounts on storage tariffs	Discounts on storage tariffs

(k)	Collecting the revenues needed to recover the capital and operational expenditures related to regulated storage facilities as storage tariffs and as a dedicated charge incorporated into transmission tariffs collected only from exit points to final customers located within the same Member States, provided that revenues collected through tariffs are not larger than the allowed revenues	Capital and operational expenditures
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Annex 2: National measures at MSs with storage

Austria

Overview

Gas storage infrastructure (August 1 st , 2023)	
Aggregate GWV	97.63 TWh
Injection capacity	852.33 GWh/d
Withdrawal capacity	1070.84 GWh/d

Storage filling targets of Gas Storage Regulation and actual gas in storage ⁷⁵					
2022			2023		
	Target	Actual		Target	Actual
1 August	49%	58%	1 February	49%	77%
1 September	60%	67%	1 May	37%	69%
1 October	70%	80%	1 July	52%	82%
1 November	80%	93%	1 September	67%	93%
			1 November	90%	N/A

Measures applied in the MS for gas storage			
a) Minimum volume in gas storage	✓	f) Financial incentives for market participants	
b) Tender of capacities		g) Unused booked capacities	✓*
c1) Balancing stock managed by TSO		h) Strategic storage	✓
c2) Obligations imposed on designated entities		i) Appointment of dedicated entity	
d) Coordinated instruments		j) Discounts on storage tariffs	✓
e) Voluntary joint procurement mechanisms		k) Capital and operational expenditures	
Other			

* Measure applied prior to the Gas Storage Regulation

Applicable legal and regulatory framework

The Austrian Gas Act 2011⁷⁶ (GWG 2011) was amended in 2022 to introduce measures according to the national decision for ensuring that the filling targets set in the Gas Storage Regulation are met.

⁷⁵ In Austria, the ratio of storage capacity to average annual demand over the past 5 years exceeds by far the threshold of 35% set in Article 6a of the Gas Storage Regulation. Nevertheless, the Austrian government has set a high national filling level target of 90%.

⁷⁶ [Link](#) to the Austrian Gas Act 2011.

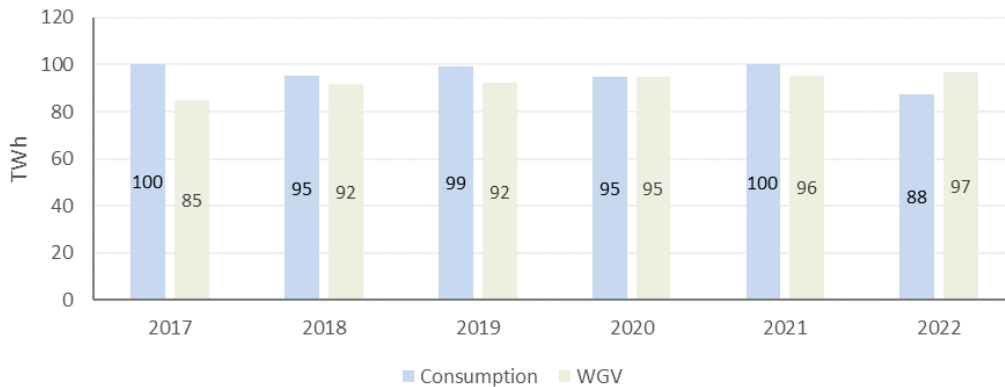
Such amendments include Federal Law Gazette I No. 38/2022⁷⁷, which introduced the measure of strategic gas reserve, and Federal Law Gazette I No. 23/2023⁷⁸ which added new provisions for the stockholding obligations set to storage users.

Third party access to gas storage facilities has been in place in Austria since 2001. Before 2022, the GWG 2011 introduced provisions related to capacity allocation mechanisms and congestions management procedures.

Gas storage infrastructure

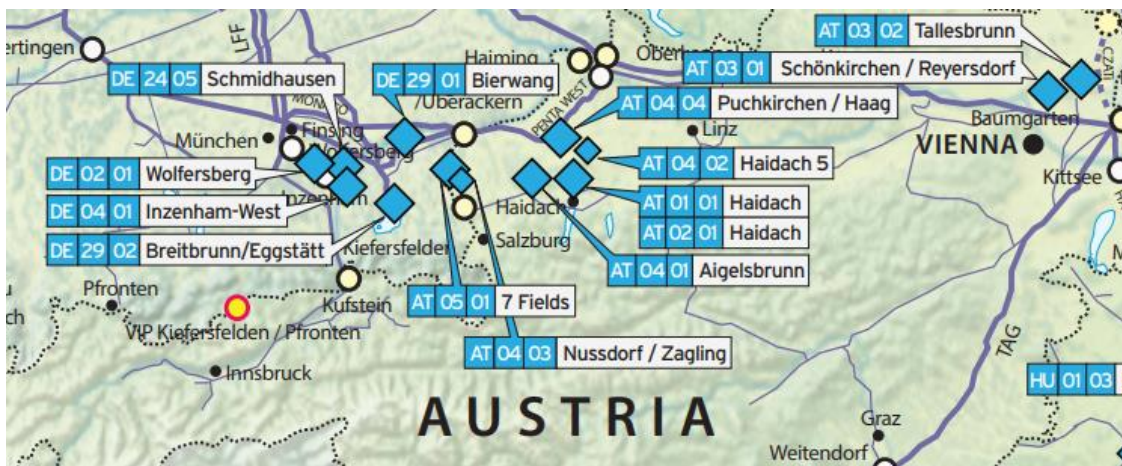
The underground gas storage infrastructure in Austria has a total gas working volume of 97.6 TWh, withdrawal capacity of 1,070.8 GWh/d and injection capacity of 852.3 GWh/d⁷⁹. Austria has large storage capacity compared to its annual gas demand. In 2022 the country’s aggregate capacity exceeded consumption (111%). Figure 14 shows how the storage capacity compares to the annual consumption for the period 2017 to 2022.

Figure 14: Storage capacity and annual gas consumption from 2017 to 2022⁸⁰



Austria has several underground gas storage facilities, the largest being UGS Haidach, that has a total storage capacity of 33.3 TWh. The locations of the country’s UGSs are presented in the map below.

Figure 15: Underground gas storage facilities in Austria⁸¹



⁷⁷ [Link](#) to Federal Law Gazette I No. 38/2022.

⁷⁸ [Link](#) to Federal Law Gazette I No. 23/2023.

⁷⁹ Source: GIE, OMV (August 1st, 2023).

⁸⁰ Sources: GIE, Eurostat.

⁸¹ Source: GIE Storage Map.

Storage capacities in Austria are marketed by Astora GmbH, OMV Gas Storage GmbH, RAG Energy Storage and Uniper Energy Storage GmbH. The technical operators of the storage facilities are OMV Austria Exploration & Production GmbH and RAG Austria AG. The technical characteristics of the storage facilities of each SSO are presented in Table 62.

Table 62: Gas storage operators and infrastructure⁷⁹

Name	GWV (TWh)	Injection (GWh/d)	Withdrawal (GWh/d)
Astora GmbH	18.82	164.16	176.32
<i>UGS Haidach</i>	<i>18.82</i>	<i>164.16</i>	<i>176.32</i>
OMV Gas Storage GmbH	26.31	213.34	308.31
<i>Schonkirchen</i>	<i>21.72</i>	<i>178.9</i>	<i>264.3</i>
<i>Tallesbrunn</i>	<i>4.59</i>	<i>34.4</i>	<i>44</i>
RAG Energy Storage	34.68	328.87	367.27
<i>UGS Puchkirchen/Haag</i>	<i>12.4</i>	<i>144</i>	<i>144</i>
<i>UGS Aigelsbunn</i>	<i>1.5</i>	<i>13.8</i>	<i>13.8</i>
<i>UGS Haidach 5</i>	<i>0.18</i>	<i>5.5</i>	<i>5.5</i>
<i>UGS Haidach (marketed by RAG)</i>	<i>14.3</i>	<i>124.8</i>	<i>141.6</i>
<i>UGS 7Fields</i>	<i>6.3</i>	<i>40.8</i>	<i>62.4</i>
Uniper Energy Storage GmbH	17.82	145.96	218.94
<i>UGS 7Fields (Uniper)</i>	<i>17.82</i>	<i>145.96</i>	<i>218.94</i>
GSA ⁸² (<i>UGS Haidach</i>)	0	0	0

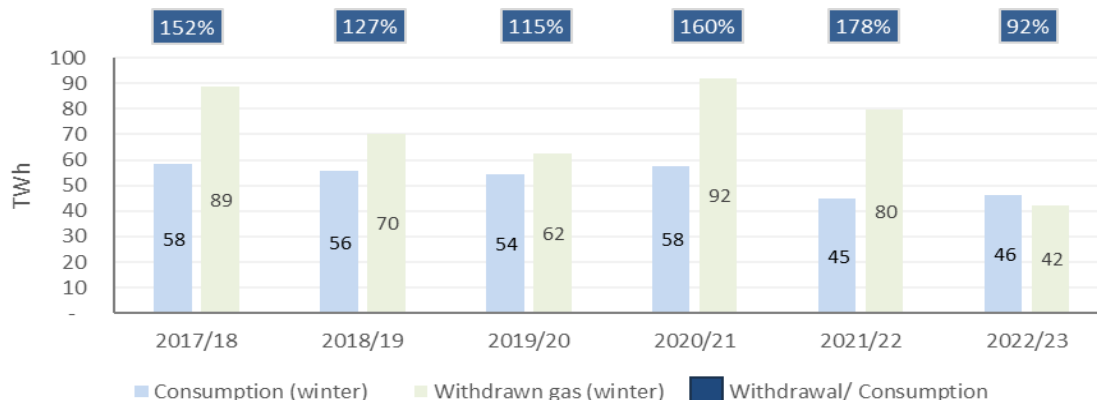
Gas storage operation and filling targets

Between 2017 and 2021, withdrawals from the Austrian storage facilities exceeded demand in the winter period (November of one year to March of the next) significantly, ranging from 115% to 178%. This is due to the use of the storage facilities not only by Austrian market participants but also by suppliers and traders from other countries. In 2022, the difference between demand and withdrawn gas was lower, amounting to 92% (Figure 16).

Entities outside Austria hold significant gas volumes in the Austrian storages. Indicatively, as of September 27th, 2023, storage customers from abroad held 48% of the present gas in storage, while the Austrian market participants used 31% (the remaining stored volumes concern mainly a strategic gas reserve procured by the government)⁸³.

⁸² From 01/08/2022 the storage system operator is inactive and thus since then capacities of the Haidach facility are marketed by Astora and RAG Energy Storage.

⁸³ Source: E-control ([Link](#)). 0,54 TWh of the strategic reserve is stored in a Slovakian storage facility directly connected to the Austrian market area East.

Figure 16: Use of gas storage to cover demand in the winter season⁸⁴


The filling targets and trajectories for Austria in 2022 and 2023, as established in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301, are presented in the Table below. Additionally, Austria introduced a national filling target, to have 90% filling by November 1st, which was not mandatory.

 Table 63: Targets and trajectories for Austria in 2022 and 2023⁸⁵

2022	1 August	1 September	1 October	1 November	
	49 %	60 %	70 %	80 %	
2023	1 February	1 May	1 July	1 September	1 November
	49 %	37 %	52 %	67 %	90 %
National target					90 %

Due to an agreement between Germany and Austria based on Regulation (EU) 2017/1938, there is a shared responsibility for the filling target concerning the storage locations of Haidach and 7Fields to be met by December 31st, 2025. The responsibility for filling is distributed between the two countries, as follows:

- Storage Haidach: Austria 21 TWh, Germany 11 TWh
- Storage 7Fields: Austria 6 TWh, Germany 17 TWh

Austria satisfies the conditions laid down in Article 6a(2) of the Gas Storage Regulation, due to the fact that the capacity of the underground storage facilities in Austria⁸⁶ as a share of the average annual gas consumption over the preceding five years (2017 – 2021) amounts to 98%, and thus is much higher than the 35% threshold of the Regulation.

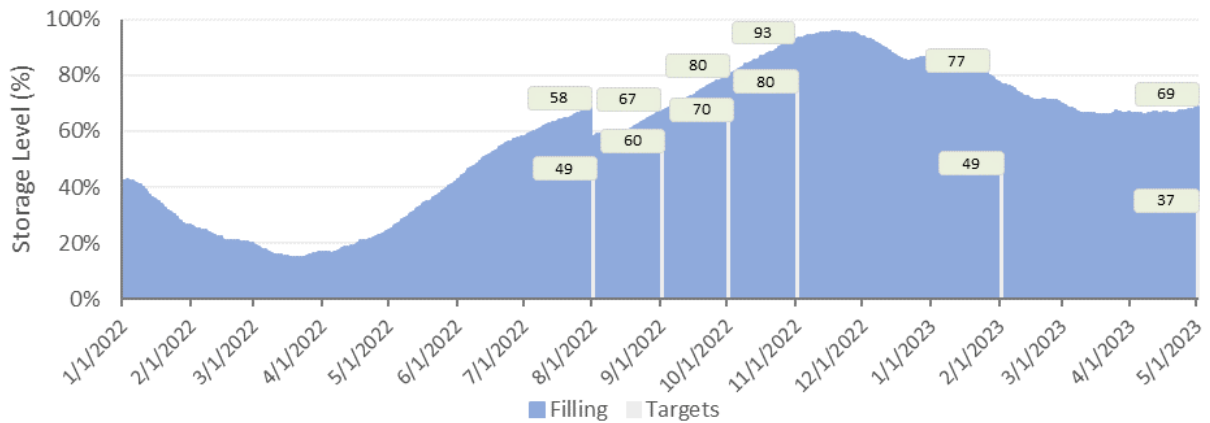
Despite satisfying the conditions laid down in Article 6a(2), Austria still succeeded in meeting the EC Gas Regulation storage filling trajectories and target for 2022 and 2023, as shown in Figure 17. On November 1st, 2022, the actual GIS was 93%, fulfilling also the 90% national target. In 2023, the actual filling remains much higher than the foreseen trajectories.

⁸⁴ Sources: GIE, Eurostat, OMV.

⁸⁵ Filling trajectories and targets as stated in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301.

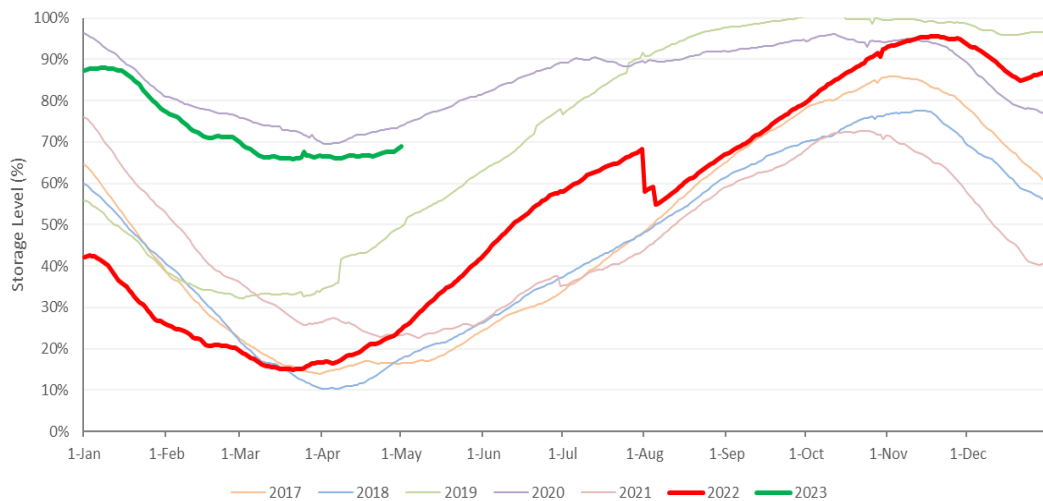
⁸⁶ As of November 1st, 2022.

Figure 17: Daily gas in storage vs filling targets in 2022 and 2023⁸⁷



Regarding the daily gas filling trends from 2017 to 2022, approximately the same pattern without substantial differentiations is observed, while the 2022 filling levels in the winter period were lower than those observed in 2019. In the beginning of 2023, gas in storage remained at higher levels compared to most previous years, with the exception of 2020, when Gazprom increased storage utilization due to the uncertainties in the transit contracts through Ukraine (Figure 18). Measures implemented in 2022, including the establishment of a new strategic gas reserve (amounting to 20% of the storage capacity) and stricter rules for the gas supply standard, have increased storage filling compared to 2021, and resulted in higher stocks in the beginning of the injection period of 2023 compared to most previous years.

Figure 18: Comparison of daily gas filling trends between 2017 and 2023⁸⁸



Overview of national measures that relate to the Gas Storage Regulation

In order to comply with the filling targets (especially the national goal of 90% gas in storage on November 1st, 2022), Austria made some adjustments to already existing measures, including the increase of the gas stock obligations by suppliers, the establishment of strategic reserves and the release of unused storage capacity.

⁸⁷ Source: GIE, OMV.

⁸⁸ Source: GIE, OMV.

According to the GWG 2011, gas suppliers with protected customers are required to store the volumes calculated by the Austrian Gas Grid Management (AGGM) and approved by E-Control (supply standard – Article 6 of the Security of Supply Regulation). The recent adjustments made to this measure concern the fact that the monitoring mechanism is stricter as of 2022 and that the pool of protected customers was expanded in 2023.

A use-it-or-lose-it mechanism is also in place, allowing SSOs to release booked but systematically unused capacities of storage users. Additionally, according to provisions of the GWG 2011 (in place prior to the Gas Storage Regulation), capacity can be removed from a storage operator under certain conditions, which is then operated by other SSOs (as happened in 2022 in the case of GSA).

As an additional measure, with the 2022 amendment to the GWG 2011, AGGM undertook to establish and maintain a strategic storage reserve. This is carried out through a subsidiary of AGGM having the sole purpose of procuring and owning a certain amount of strategic reserve for up to September 2025.

The mechanism outlined above combines a number of measures from the list of Article 6b(1) of the Gas Storage Regulation:

Measure	Implementation	Relevance to Article 6b(1) measures
Gas suppliers of protected customers are required to fulfil the legal obligation of the supply standard (Article 6 of Security of Supply Regulation) and provide proof of the capacity that they hold with each SSO. For this purpose, E-Control may also request the contracts (between the suppliers and SSOs) themselves, if needed.	Amended in 2022 and 2023	Requiring gas suppliers to store minimum volumes of gas in storage facilities, including in underground gas storage facilities and/or in LNG storage facilities, those volumes to be determined on the basis of the amount of gas supplied by gas suppliers to protected customers (point a).
Systematically unused storage capacity can be released by the SSO. Additionally, capacity of an SSO can be taken away, under certain conditions and assigned to another SSO.	Additional provisions were introduced in 2022	Requiring storage capacity holders to use or release unused booked capacities, while still obliging the storage capacity holder not using the storage capacity to pay the agreed price for the whole term of the storage contract (point g).
ASGM has to establish and maintain strategic reserves, intended for SoS purposes only.	Introduced in 2022	Adopting effective instruments for the purchase and management of strategic storage by public or private entities (point h).

These measures are analysed in detail below.

It should be noted that Section 103 of the GWG 2011 introduced storage capacity allocation mechanisms several years before the Gas Storage Regulation. SSOs must select the appropriate capacity allocation mechanism, including auctions, in case demand for capacity exceeds the available one. As the capacity allocation mechanism has not been amended with a view to meeting the storage

filling targets, it is not analysed further in the Study, although it corresponds to point (b) of Article 6b(1) of the Gas Storage Regulation.

National measures implemented due to the Gas Storage Regulation

Minimum volume in gas storage (point (a) of Article 6b(1))

Implementation of the measure

The GWG 2011 assigns to the suppliers of protected customers the obligation of meeting the supply standard (according to Article 6 of the Security of Supply Regulation) by storing gas at the Austrian underground storage facilities. With amendments to the GWG in 2022 and 2023, and with the Supply Standard Ordinance (Ordinance on the evidence and verification of the gas supply standard for protected customers in Austria)⁸⁹ by E-Control, the criteria for meeting the supply standard were applied more strictly from 2022 onwards, to enhance security of supply.

The GWG 2011 was amended by Federal Law Gazette I No. 23/2023, and as a result the definition of protected customers was expanded in March 2023. Apart from household customers and basic social services, certain district heating customers were also included, as these customer groups (household customers, basic social services, or small and medium-sized companies) that are supplied by a district heating system cannot switch to a fuel other than gas without technical installation measures.

The minimum gas volume that the suppliers have to store to apply the supply standard, for each type of protected customer, is defined as follows:

- For households, the minimum volumes are based on historic temperature data and the synthesis factors.
- For basic social services, the minimum volumes are defined by applying a markup on top of the household volumes.
- For district heating plants, the minimum volumes are defined based on the gas used for the production of heat, which was supplied to protected district heating customers over the past year.

The volume obligation of each supplier is calculated by AGGM, that communicates them to E-Control, which verifies them and informs the suppliers accordingly.

Since winter 2022, the suppliers of protected customers must provide proof of the capacity that they hold with each SSO (E-Control has access to these data as the SSOs are obligated to report them to E-Control). Moreover, E-Control may also request the storage contracts themselves.

In case that gas suppliers do not comply with the measure, there is a penalty provision in the GWG 2011, according to which failure to comply with the obligation is punishable by an administrative fine of up to 75,000 €.

Recovery of costs associated with implementation of the measure

Gas suppliers with protected customers recover their costs for carrying out the obligations under this measure through the end-user prices charged to their customers.

⁸⁹ [Link](#) to the Supply Standard Ordinance.

On its behalf, E-Control performs an analysis of the costs accruing from the implementation of this measure, which relies on calculations and estimations. This analysis is only for internal use and is also not being published.

Monitoring and transparency

It is the task of E-Control to monitor the suppliers' compliance with this measure. The storage volume obligation of each involved gas supplier is not publicly available. Instead, each supplier is informed individually by E-Control. Then, E-Control oversees the measure's implementation.

The monitoring procedure is described below:

- The AGGM calculates the prescribed volumes for the storage obligations for each supplier.
- E-Control verifies this and informs the suppliers.
- Suppliers need to submit the data on the storage contracts and the gas in storage for the fulfilment of the obligation to E-Control.
- E-Control checks the data and provides feedback to the suppliers if something is not correct, or the fulfilment of the obligation is not sufficient.

Effects on the gas market

The effects on the gas market are not measured (e.g., via a market consultation). E-Control assumes that potential impacts of the measure may relate to the following:

- For the storage market, the biggest suppliers already held storage capacity and only dedicated some of it for their protected customers, while only the smaller suppliers concluded additional contracts, which potentially raised storage costs for them, as there was less storage capacity left.
- Regarding the retail market, as suppliers factor the additional costs for the supply standard in their prices for retail customers, the measure could have potentially increased the retail prices.

Difficulties and risks with the implementation of the measure

According to E-Control, there were a lot of suppliers raising concerns regarding additional storage obligations. The Regulator received feedback from the affected suppliers and especially from smaller suppliers for whom this obligation was hard to fulfil. Reasons stated were:

- Short-term booking of storage capacity was expensive.
- The products offered by storage operators were not fitting the needs of small suppliers.
- Suppliers without existing storage contracts saw themselves at a disadvantage compared to suppliers with existing storage contracts.
- Suppliers did not have the knowledge about the operative storage management.

According to E-Control, through communication with the concerned parties, most of these concerns were resolved.

Application of the measure in 2022/23

The measure's contribution in meeting the gas storage filling target for 2022 was around 3.7 TWh in January 2023⁹⁰. However, most of the storage contracts were already in place, so this quantity should not be treated as additional volumes resulting from the measure.

In 2023, due to the fact that the district heating plants were added to the group of protected customers and thus this group was added to the supply standard, the contribution of the measure is expected to be higher (by approximately 1 TWh/month) and around 4.7 TWh in January 2024.

Regarding the cost from the implementation of the measure, taking into account that in 2022 the group of protected customers consisted only of households and basic social services, E-Control estimates, that the costs were around 38 mil. € for the suppliers (storage costs and grid fees). In 2023, with district heating plants also categorized as protected customers, the costs might increase by 12 mil. €, to a total of around 50 mil. €.

Strategic storage (point (h) of Article 6b(1))

Implementation of the measure

According to Federal Law Gazette I No. 38/2022, amending the GWG 2011, the AGGM is entrusted with the procurement and management of a strategic gas reserve. Its subsidiary, the Austrian Strategic Gas Storage Management GmbH (ASGM) was founded for this purpose.

ASGM has the legal obligation to procure the strategic gas reserves through a market-based, transparent, non-discriminatory, public tendering procedure and it also acts as the owner of the reserves. The strategic gas reserves may be procured in several parts. As a matter of fact, between May and August 2022, ASGM conducted two public tender procedures for the procurement of the strategic gas reserve⁹¹. Three different products were offered in these tenders:

- Gas in storage: Providers offer to ASGM gas quantities together with storage capacity at an underground facility.
- Storage capacity: SSOs offer to ASGM capacity at their storages. Capacity that has been released due to congestion management measures can also be offered.
- Commodity baseload: Providers offer to ASGM gas quantities, to be stored using storage capacity that was procured by ASGM (including with the "storage capacity" product).

The gas of the strategic storage can only be used for security of supply reasons, i.e., the Federal Minister for Climate Action, Environment, Energy, Mobility, Innovation and Technology may issue an ordinance decreeing the strategic gas reserves to be activated. Otherwise, it has to be left in storage until September 30th, 2025⁹², and cannot be used for any other purposes.

Recovery of costs associated with implementation of the measure

The costs incurred by ASGM for establishing and maintaining the strategic reserves were covered by federal funds. The costs covered include cost of capital, storage fees, system charges, operational

⁹⁰ In 2022 the storage obligation ramped up from October (1.5 TWh) to January (3.7 TWh) and back down to March (2.5 TWh).

⁹¹ For more information see AGGM's relevant webpage ([Link](#)).

⁹² A prolongation until 2026 is under discussion.

expenses, any valuation gains or losses, and any taxes, fees or levies payable. ASGM (and consequently AGGM) should not make any profits or losses from implementing this measure.

Monitoring and transparency

The ASGM has to present an annual report on the procurement and use of the strategic gas reserves to the National Council, E-Control, the Federal Minister for Climate Action, Environment, Energy, Mobility, Innovation and Technology, the Federal Minister for Labour and Economy, and the Federal Minister of Finance, and publish it by April 30th of each year. The report shall in particular contain a summary of the results of the tendering procedure.

Effects on the gas market

Due to the fact that the strategic gas reserves represent storage capacities which are no longer available to the market, the measure has a price effect from which benefit the SSOs (due to the long-term reservation of capacity) but may increase the storage prices for storage users due to potential congestion.

Difficulties and risks with the implementation of the measure

An issue encountered was that at the first tendering process the offers for the different products were lower than the goal of 12.6 TWh as the available storage capacities were limited. However, in the second tender the requested products were adjusted. In addition to that the storage capacity from Speicher Haidach released after E-Control applied the use-it-or-lose-it mechanism on Gazprom Exports' booked capacity, was made available. As a result, the overall goal of 20 TWh was reached.

Another challenge that may arise is that once the measure ceases to exist, all the strategic gas reserves should be made available to market participants in an organised and market-oriented manner.

Application of the measure in 2022/23

In 2022 ASGM carried out two tenders for procuring strategic gas reserves, between May and August 2022, with a target to reach 20 TWh.

During the first tender 12.6 TWh were requested (corresponding to the consumption in January 2021) but only 7.7 TWh were awarded. Nevertheless, the goal of 20 TWh was reached in the second tender. The fact that the capacity booked by Gazprom Export and marketed by GSA at the Haidach UGS was released by E-Control and offered in during the tender made procuring the required reserves possible. The procured volumes were made available to ASGM on November 1st, 2022. Out of the 20 TWh of gas obtained, 8.5 TWh came from non-Russian sources.

The amount required from federal funds to cover the costs associated with this measure was approximately 4 bil. €.

The reserves will most likely remain in storage in 2023, continuing to contribute 20 TWh to the storage filling.

National measures in place prior to the Gas Storage Regulation

Unused booked capacities (point (g) of Article 6b(1))

Implementation of the measure

According to Section 104 of the GWG 2011, in the event that a storage user leaves all or parts of their booked capacity systematically unused⁹³, they should immediately offer it through the secondary market or return it to the SSO. If capacity is unused and not offered on the secondary market or returned to the SSO, then the storage operator immediately withdraws the systematically unused booked capacity for the period of time until March 31st of the following year.

The SSO offers the released capacity to the market and reduces the impacted user's storage fee by the resulting revenue, minus an adequate administration fee for the SSO. The storage user continues to be bound by the rights and obligations of their storage contract as long as the storage capacity is not booked. Once all the released capacity has been booked by other users, the user that lost the capacity no longer has to pay the corresponding storage fee.

Furthermore, Section 104a of the GWG 2011 stipulates that a system operator may lose its rights, and thus all of its capacity, according to a set of criteria related to the operation of the SSO in line with the provisions of the GWG 2011.

Recovery of costs associated with implementation of the measure

The SSO recovers its costs, as it continues to receive the storage tariff from the user that lost its capacity, until the released capacity is marketed and booked by another user.

Monitoring and transparency

SSOs monitor if there is unused capacity, in coordination with E-Control.

Effects on the gas market

Implementation of this measure relieved the congestion in the gas storage system, as unused storage capacity of Gazprom Export (as storage customer of GSA) was made available to the market.

Difficulties and risks with the implementation of the measure

There were no challenges and risks when implementing this measure due to the fact that everything is clearly defined by law and SSOs are operating in coordination with storage users and E-Control, to avoid the occurrence of systematically unused capacity and take the appropriate measures in case unused capacity has to be withdrawn from a user and put in the market.

Application of the measure in 2022/23

In 2022 GSA lost its SSO rights, in accordance with Section 104a of the GWG 2011. Astora undertook operation of its capacity at Haidach UGS. Systematically unused capacity of Gazprom Export at that storage was released and offered to the market by Astora and RAG Energy Storage, as part of the second tender carried out by ASGM for procuring strategic gas reserves (see measure [Strategic Storage](#)).

⁹³ By "systematically unused" the GWG 2011 refers to any booked storage capacity that was being used to an extent of less than 10% on July 1st of each year.

Up to date, 21 TWh of unused capacity, previously held by Gazprom Export, have been released through this measure, and the whole capacity has been booked by other market participants.

Key takeaways

- The underground storage facilities in Austria have large aggregate gas working volume of about 98 TWh, corresponding to around 100% of annual gas consumption.
- Austria applied the conditions laid down in Article 6a(2) of the Gas Storage Regulation (storage capacity corresponds around 100% of the average annual consumption of the past 5 years). Nevertheless, on November 1st, 2022, the gas in storage was 93%, so both the target of the Gas Storage Regulation and the national target (90% filling level) were met. In 2023, the current filling remains much higher than the foreseen trajectories.
- Measures implemented in 2022 have increased gas in storage compared to 2021 and have resulted in higher stocks in the beginning of the injection period of 2023 compared to most previous years.
- Austria is implementing a mix of adapted and new measures to fulfil the national filling targets, which are defined in the amended Austrian Gas Act 2011:
 - The suppliers of protected customers have been already obligated to proof in detail to E-Control that they comply with the supply standard. Although this measure was in place before the Gas Storage Regulation, it was amended in 2022 and 2023, introducing a storage obligation and expanding the definition of protected customers. Implementation of this measure is monitored by E-Control.
 - An adapted use-it-or-lose-it mechanism is in place for systematically unused storage capacity, that the SSO can release and offer to the market. Implementation of this measure is monitored by E-Control.
 - Austrian Strategic Gas Storage Management (ASGM) has been tasked with establishing and maintaining a strategic gas reserve. To do so, ASGM conducted tenders for procuring gas quantities and storage capacities. The costs of ASGM are covered by federal funds. Monitoring of the measure is carried out by E-Control together with the National Council and other stakeholders.
- The measures had the following impact:
 - The suppliers held in storage 1.5 TWh in October 2022, increasing to 3.7 TWh in January 2023, to meet the supply standard. In 2023 this obligation is expected to increase further, resulting in the storing of 4.7 TWh in January 2024. The storage costs of the suppliers in 2022/23 are estimated to 38 mil. €, increasing to 50 mil. € in 2023/24.
 - 21 TWh of unused capacity, previously held by Gazprom Export and marketed by GSA, was released, offered to the market and booked by other market participants.
 - ASGM secured 20 TWh through two tenders conducted in 2022 (the second one including the released capacity of Gazprom Export). The cost of the measure was approximately 4 bil. €. The 20 TWh will most likely remain in storage in 2023.

Belgium

Overview

Gas storage infrastructure (August 1 st , 2023)	
Aggregate GWV	7.6 TWh ⁹⁴
Injection capacity	88 GWh/d
Withdrawal capacity	170 GWh/d

Storage filling targets of Gas Storage Regulation and actual gas in storage					
	2022			2023	
	Target	Actual		Target	Actual
1 August	49%	76%	1 February	30%	69%
1 September	62%	89%	1 May	5%	48%
1 October	75%	100%	1 July	40%	83%
1 November	80%	100%	1 September	78%	100%
			1 November	90%	89%

Regulatory measures applied in the MS for gas storage			
a) Minimum volume in gas storage		f) Financial incentives for market participants	
b) Tender of capacities	✓	g) Unused booked capacities	✓
c1) Balancing stock managed by TSO		h) Strategic storage	
c2) Obligations imposed on designated entities		i) Appointment of dedicated entity	
d) Coordinated instruments		j) Discounts on storage tariffs	✓*
e) Voluntary joint procurement mechanisms		k) Capital and operational expenditures	
Other			

* Measure in place prior to the Gas Storage Regulation and not amended in 2022

Applicable legal and regulatory framework

The provisions of the Gas Storage Regulation were implemented by the Ministry of Economic Affairs - Department of Energy with the following types of documents:

- Belgian Gas Act at art. 15/11 §2, modification in Art. 10: Loi modifiant la loi du 12 avril 1965 relative au transport de produits gazeux et autres par canalisations (Law of February 14th, 2022, amending the law of April 12th, 1965, relating to the transport of gaseous and other products by pipeline)⁹⁵.

⁹⁴ Figure for firm capacity. Depending on working conditions, additional capacity can be offered to shippers.

⁹⁵ [Link](#) to the Belgian Gas Act at art. 15/11 §2, modification in Art. 10.

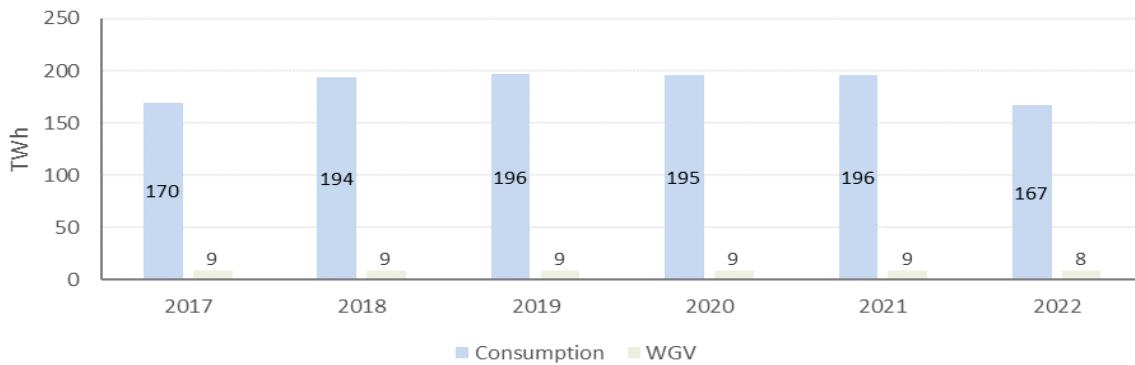
- Access Code for Storage⁹⁶, approved by CREG on October 27th, 2022.
- Storage Programme⁹⁷, approved by CREG on October 27th, 2022.
- Standard Storage Agreement⁹⁸, approved by GREG on October 27th, 2022.

A consultation process took place for the finalization of the Access Code for Storage, the Storage Programme, and the Standard Storage Agreement, which resulted in feedback related to implementation of the provisions of Regulation (EU) 2022/1032 and of the measures when storage users deviate from filling trajectories and targets.

Gas storage infrastructure

The underground gas storage infrastructure in Belgium has a firm gas working volume of 7.6 TWh, withdrawal capacity of 170 GWh/d and injection capacity of 88 GWh/d⁹⁹. Depending on working conditions, additional capacity can be offered to shippers (1.2 TWh in 2023). Storage capacity in Belgium is limited and corresponds to just 5% of the country’s annual gas consumption. Figure 19 shows how the storage capacity compares to the annual consumption for the period 2017 to 2022.

Figure 19: Storage capacity and annual gas consumption from 2017 to 2022¹⁰⁰



Belgium has a single underground storage facility (Loenhout), shown in the map below.

Figure 20: Underground gas storage facilities in Belgium¹⁰¹



⁹⁶ [Link](#) to the Access Code for Storage.

⁹⁷ [Link](#) to the Storage Programme.

⁹⁸ [Link](#) to the Standard Storage Agreement.

⁹⁹ Source: Fluxys (August 1st, 2023).

¹⁰⁰ Sources: GIE, Eurostat.

¹⁰¹ Source: GIE Storage Map.

The storage facility is operated by Fluxys, and its technical characteristics are presented in Table 64.

Table 64: Gas storage operators and infrastructure⁷⁹

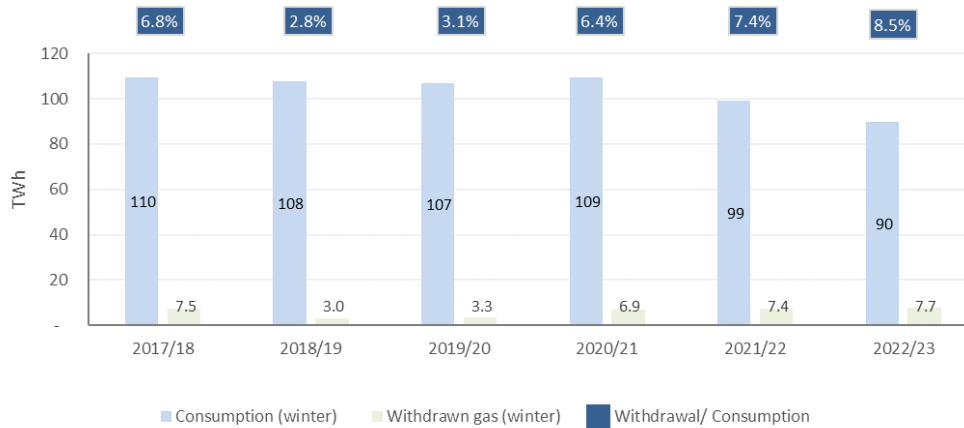
Name	GWV (TWh)	Injection (GWh/d)	Withdrawal (GWh/d)
Fluxys (Loenhout)	7.6	88.1	169.7

In addition to the underground gas storage facility, Belgium can also store gas at its LNG facility, the Zeebrugge terminal, with temporary storage capacity of 566,000 m³ LNG¹⁰². This capacity is however not to be considered as storage capacity as defined under the Gas Law.

Gas storage operation and filling targets

Gas withdrawn from the Belgian storage facility during the winter period (November of one year to March of the next), between 2017/18 and 2022/23, was significantly lower than gas demand during the same period, ranging from 3% to 9% (Figure 21).

Figure 21: Use of gas storage to cover demand in the winter season¹⁰³



The filling targets and trajectories for Belgium in 2022 and 2023, as established in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301, are presented in the Table below. It should be noted that there was already a mandatory request to fill the storage up to 90% by November 1st and to have at least 30% of gas in storage by February 15th.

Table 65: Targets and trajectories for Belgium in 2022 and 2023¹⁰⁴

2022	1 August	1 September	1 October	1 November	
	49 %	62 %	75 %	80 %	
2023	1 February	1 May	1 July	1 September	1 November
	30 %	5 %	40 %	78 %	90 %
National target prior to the Gas Storage Regulation	15 February				1 November
	30 %				90 %

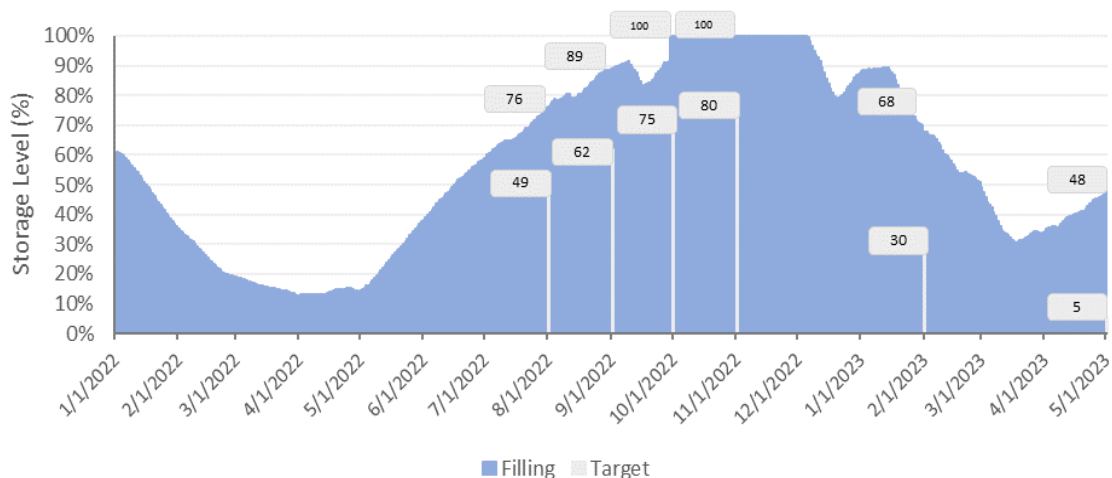
¹⁰² Source: GIE.

¹⁰³ Sources: Fluxys, GIE, Eurostat.

¹⁰⁴ Filling trajectories and targets as stated in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301.

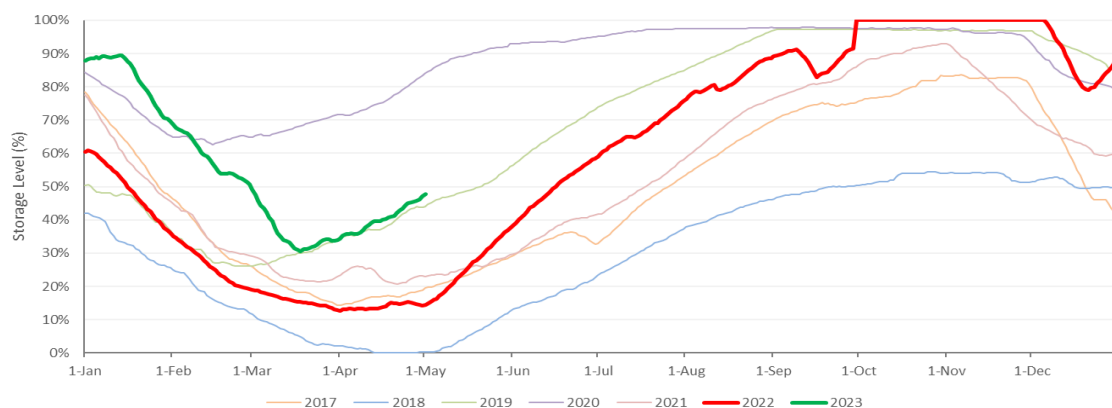
Belgium has succeeded in meeting and even exceeding the EC Gas Regulation storage filling trajectories and targets, as well as the national targets, for 2022 and 2023 so far (Figure 22). In fact, the storage was completely filled from the beginning of October up to early December 2022.

Figure 22: Daily gas in storage vs filling targets in 2022 and 2023¹⁰⁵



The storage filling in the winter of 2022/23 followed the same trend with the fillings in 2019 and 2020 and was higher than the filling levels during the winter of 2021 (Figure 23).

Figure 23: Comparison of daily gas filling trends between 2017 and 2023¹⁰⁶



Overview of national measures

In order to comply with the Gas Storage Regulation, Belgium made adjustments to already existing measures namely, to tendering of storage capacities, releasing unused storage capacity, and providing discounts for storage products.

Storage capacity is allocated in Belgium through auctions and subscription windows. Prior to the entry into force of the Gas Storage Regulation, companies with contracts for gas storage in Belgium were already obligated to fill at least 90% of contracted storage volumes by November 1st each year, and to maintain a level of gas storage above 30% of their contracted volume until February 15th.

According to the Attachment D1 of the Access Code for Storage, in order to fully align with the Gas Storage Regulation, CREG decided on the application of multiple “control points”, namely on February

¹⁰⁵ Source: Fluxys. Filling levels correspond to firm capacity of the storage facility.

¹⁰⁶ Source: Fluxys.

1st, May 1st, July 1st and September 1st for year 2023. CREG maintained the November 1st control point, when the aggregate gas in storage of all storage users should meet the target set by the EC for Belgium. In other words, the filling target (previously defined as “GIS (Gas In Storage) 90% rule”) has the meaning and value pursuant to Article 6a of the Gas Storage Regulation and represents the minimum filling level storage users must achieve for their seasonal storage volume on November 1st.

Auctions for storage capacity have been carried out in Belgium at reserve prices lower than the regulated tariff, as an incentive to market participants to book storage capacity in the country. These discounts are described as a measure in Belgium’s Preventive Action Plan¹⁰⁷, published in July 2019, and have not changed as a result of the Gas Storage Regulation.

As a last resort measure, introduced in 2022, in case a storage user is not able to achieve its filling trajectories and targets, it will lose a part of their services while still paying at least the regulated storage tariffs for the remaining service period.

The mechanism outlined above combines a number of measures from the list of Article 6b(1) of the Gas Storage Regulation:

Measure	Implementation	Relevance to Article 6b(1) measures
Storage capacity offered via auctions. Storage users have obligations to keep certain levels of storage filling otherwise they are penalized.	Amended in 2022	Requiring storage system operators to tender their capacities to market participants (point b).
Offering of capacity at reserve prices at a discount compared to the regulated tariff.	Prior to 2022	Providing discounts on storage tariffs (i.e., Discount on tariffs for gas storage products) (point j).
Use-it-or-lose-it measure is triggered if a storage user appears to be unable to reach its filling trajectory/target.	Amended in 2022	Requiring storage capacity holders to use or release unused booked capacities, while still obliging the storage capacity holder not using the storage capacity to pay the agreed price for the whole term of the storage contract (point g).

These measures are analysed in detail below.

¹⁰⁷ [Link](#) to the Preventive Action Plan.

National measures implemented due to the Gas Storage Regulation

Tender of capacities (point (b) of Article 6b(1))

Implementation of the measure

In order to meet the filling trajectory targets between May and February the next year, storage users¹⁰⁸ having booked seasonal storage have to ensure that their gas in storage is never less than the filling trajectory targets applied to their seasonal storage volume. Regarding the latter, each individual storage user should comply with the gas filling trajectory targets, as defined by the EC for Belgium. Between May and February the next year, storage users having booked seasonal storage services have to collectively ensure that the sum of their gas in storage is not less than the current filling trajectory target applied to the sum of their seasonal storage volume, where the current filling trajectory target means from May to November the requested filling percentage of the last control point of the filling trajectory crossed minus 5 percentage points and from November to February the requested filling percentage of the upcoming control point of the filling trajectory minus 5 percentage points.

According to the Attachment C2 of the Storage Access Code, the mechanism applied for launching the capacity tenders involves capacity sold via public auctions using an ascending clock mechanism (see Figure 24 for an overview of the capacity allocation mechanisms via auctions in Belgium). The offered products are bundled (injection capacity + storage volume + withdrawal capacity). The price at which capacity is offered with the ascending clock mechanism may be different than with the other capacity contracting mechanisms applied, as the reserve price is formulated based on the summer-winter spread and has been lower than the regulated price over the past years. The frequency of these auctions is left upon Fluxys Belgium to decide, at an optimal timing that will incentivize market participants to book capacity considering the summer-winter spread and the offered reserve price.

Figure 24: Overview of the allocation mechanisms



According to Chapter 2.6 of the Access Code for Storage, a penalty was also introduced when market participants are not compliant with their filling trajectories (a penalty was already in place only for the November 1st control point). In case the sum of the gas in storage of storage users having subscribed

¹⁰⁸ Storage user: Fluxys Belgium's customer wishing to inject, store and withdraw natural gas.

to seasonal storage services does not meet the filling trajectory, the storage operator will analyse the gas in storage of each storage user having contracted seasonal storage services. If the gas in storage of one of these storage users is less than the current filling trajectory target applied to their seasonal storage volume, the concerned storage user will pay a daily filling trajectory penalty (FTP_d) calculated as follows:

$$FTP_d = \max (0.1 \times (CFFT \times SSV - EGIS_h) \times EGSI; 0)$$

Where:

- CFFT: Current filling trajectory target for gas day d
- SSV: Seasonal storage volume
- $EGIS_h$: Energy in gas in storage for the last hour of gas day d expressed in MWh
- EGSI: ZTP European Gas Spot Index for gas day d

In other words, the penalty per day amounts to 10% of ZTP gas spot price per MWh below the trajectory (taking into account the 5% tolerance foreseen in the regulation).

When a storage user has booked seasonal storage services and additional storage volume service, the SSO will consider that the storage user injects gas to fill its seasonal storage volume first before starting to fill its additional storage volume. On the contrary, when the storage user withdraws gas, the storage operator will always consider that the storage user empties its additional storage volume first before starting to withdraw from its seasonal storage volume.

According to the Attachment F of the Access Code for Storage, the following criteria are applicable for determining whether the filling target can be reached and whether the contracted storage services are used by the storage users:

- The following is considered as unutilized: the positive delta between the contracted seasonal storage volume of the user concerned multiplied by the filling target and its actual gas in storage as per November 1st.
- During the injection period, the storage operator simulates, at least on a weekly basis, if the storage user can still reach a level of gas in storage of at least of the filling target by November 1st (assuming that the storage user is using his injection capacity at the maximum rate). If the simulation indicates that the requested level cannot be reached, the following is considered as unutilized: the part of the positive delta between the subscribed seasonal storage volume of the storage user concerned multiplied by the filling target and the maximum level of gas in storage that the user can reach by November 1st.

The simulation follows these steps:

- The simulation at a certain date calculates the forecasted gas in storage ($GIS_{u,TdFT,Inj\%}$) on November 1st for a certain storage user (u) and a certain use of the firm inject capacity ($Inj\%$) as follows:

$$GIS_{u,TdFT,Inj\%} = Av \cdot IN_{u,Td} * Inj\% * (T_{dFT} - T_d) + GIS_{u,Td}$$

Where:

- T_d is the date on which the simulation is performed
- T_{dFT} is the date of November 1st for the filling target rule

- $AvIN_{u,Td}$ is the average at T_d of the firm injection capacity for a user (u) between T_d and T_{dFT} , taking into account the forecasted real injection capacity of the user between T_d and T_{dFT}
- $Inj\%$ is the percentage of $AvIN_{u,Td}$ that is taken into account for the forecast, typically between 90% and 100% $GIS_{u,Td}$ is the gas in storage for user (u) at T_d
- The forecasted gas in storage rate of a storage is calculated by the following ratio:

$$GIS\%_{u,Inj\%} = GIS_{u,TdFT,Inj\%} / SSV_{u,Td}$$

Where $SSV_{u,Td}$ the seasonal storage volume of storage user (u) at T_d

- The forecasted unutilized seasonal storage volume of a storage user for a particular injection capacity use is then calculated as follows:

$$Unutilized_{u,Inj\%} = SSV_{u,Td} * FT - GIS_{u,TdFT,Inj\%}$$

Where FT is the filling target

When a storage user reaches a gas in storage equal to or higher than the filling target applied to its seasonal storage volume before the point of time T_{dFT} , then no unutilized capacity is considered for the related storage user.

Recovery of costs associated with implementation of the measure

There is no specific mechanism in place for the recovery of any costs accruing from the implementation of this measure. Any potential deficit of the SSO, if the revenues accumulated from the charges to the storage users are lower than the allowed revenue, is covered by the regularization account. The evolution of the regularization account is published by CREG on a yearly basis. For 2022, the regularization account for the storage activity shows a decrease of 11.4 mil. €, so that the balance on December 31st, 2022, was 41.6 mil. €¹⁰⁹. The reallocation of the amounts of this account is performed under the control of CREG.

Monitoring and transparency

The SSO monitors the use of the storage services that have been contracted by the storage users on the primary market and the compliance with the filling trajectory and filling target rules. Additionally, sold capacity is published by the storage system operator after each auction.

The SSO submits to CREG information, regarding the individual capacity utilization rate of each user, and the results of the simulations concerning the expected utilization, at least on an annual basis (before the end of February of each year). The information may also be submitted upon request of the CREG or in case the filling target cannot be reached by a storage user or in case of congestion.

The SSO publishes the global utilization rate for contracted storage services daily at its data publication platform¹¹⁰.

¹⁰⁹ [Link](#) to GREC Decision (B)656G/51

¹¹⁰ [Link](#) to the Electronic Data Platform.

Effects on the gas market

The auction enabled the full sale of the storage capacity to several market participants which seems to indicate that the system was welcomed by the market. Moreover, the whole capacity was allocated without congestion.

Difficulties and risks with the implementation of the measure

Since the auction process was already in place, there were no new challenges or risks. In general, the main challenge before launching an auction is to correctly define the auction reserve price.

Application of the measure in 2022/23

The sale of capacity at a price in line with the summer-winter spread resulted in a use of the regularization account for 2022 of 11.4 mil. €. No need for a use of the regularization account foreseen in 2023.

Unused booked capacities (point (g) of Article 6b(1))

Implementation of the measure

This measure is described in Attachment F of the Access Code for Storage, and in the Storage Standard Agreement in art. 16.5 of the General conditions¹¹¹. The measure is triggered if a storage user appears to be unable to reach its filling trajectory target based on its foreseen injection pattern. The released capacity is offered in the market through a mechanism that involves the Ministry of Economic Affairs - Department of Energy, CREG and the SSO, as described below.

During the injection period, in order to comply with the provisions of the Gas Storage Regulation, the Ministry of Economic Affairs - Department of Energy, in coordination with CREG, may decide to release booked seasonal storage capacity that is unutilized by a storage user. They may decide to offer the released capacity on the market or to take additional measures. The storage user, the capacity of whom was released, will continue to pay 100% of the released capacity at least at the regulated tariff¹¹².

The Access Code for Storage stipulates the following procedure for the use-it-or-lose-it mechanism, which is initiated if the SSO notices that a storage user will not be able to reach the filling target considering 90% of its average firm injection capacity:

- Step 1: Inform CREG: When unutilized capacity is forecasted for a storage user considering 90% of its average firm injection capacity, the SSO informs CREG on the storage user, its unutilized capacity, and the forecasted unutilized capacity.
- Step 2: Inform the storage user impacted: The SSO immediately informs the storage user impacted of their amount of unutilized capacity forecasted considering 90% of their average

¹¹¹ [Link](#) to the Access Code for Storage and to the Storage Standard Agreement.

¹¹² In case the storage operator must reduce the storage services of the storage user in application of the provisions of the Article 3 of Attachment F of the Access Code, the storage operator will apply a termination indemnity corresponding to:

- a. 100% (one hundred percent) of the amounts still to be invoiced for such unutilized storages services until the end date set out in the services confirmation, where the services have been sold at a price equal to or above the regulated tariffs; or
- b. the quantity of services still to be invoiced for such unutilized storage services until the end date set out in the services confirmation times the regulated tariffs where the services have been sold at a price below the regulated tariffs.

firm injection capacity. The SSO also asks the storage user to increase its injection nominations promptly, in order to be compliant with the filling target rule.

- Step 3: Use of the secondary market: The storage user may trade their seasonal storage services on the secondary market platform or over the counter in order to reduce their forecasted unutilized capacity considering 90% of their average firm injection capacity.
- Step 4: Decision on capacity release and decision on new allocation:
 - When unutilized capacity is forecasted for a storage user considering 100% of its average firm injection capacity, the SSO informs CREG.
 - Considering the available injection capacity, the SSO rules on the release of the capacity and informs the storage user accordingly.
 - If the available injection capacity shows that the filling target can still be reached, the SSO may determine a date on which it will reassess whether unutilized capacity is still forecasted.
 - If the SSO decides to release capacity, the injection withdrawal and storage capacity of the user are reduced by a factor equal to the unutilized capacity divided by the seasonal storage volume.
 - The capacity is released to the market through a mechanism that is proposed by the SSO and decided by the Ministry of Economic Affairs-Department of Energy in coordination with CREG.

In case the released seasonal storage services are allocated via an allocation window and additional measures are needed to be able to sell the released seasonal storage services, the Ministry of Economic Affairs-Department of Energy, in coordination with CREG, will decide which additional measures must be applied for security of supply reasons. A filling target penalty (see measure [Tender of capacities](#)) corresponding to the cost of the additional measures will be invoiced to the storage user by the SSO.

Recovery of costs associated with implementation of the measure

The measure is part of the SSOs' activities and is recovered through the storage tariffs.

Monitoring and transparency

The SSO monitors the ability of the market participants to reach their filling target and reports any concern that the filling target will not be reached to the regulator. The Ministry of Economic Affairs - Department of Energy and CREG are also involved in determining if and how any capacities of users will be released.

Effects on the gas market

The measure has not been used so far to be able to assess its effect on the gas market.

Difficulties and risks with the implementation of the measure

No challenge, risk or difficulty have been encountered for this measure, since the monitoring of the users' ability to reach the filling target was already a task of the system operator.

Application of the measure in 2022/23

There was no need to implement this measure yet.

National measures in place prior to the Gas Storage Regulation

Discounts on storage tariffs (point (j) of Article 6b(1))

The discount essentially refers to the ability to sell storage capacity in the auctions allocating capacity at a price below the regulated tariff as foreseen in the Belgian Gas Act at art. 15/11 §2. The differential between the regulated and reserve price offered is related to the market value of storage, through an analysis of the summer-winter spread. The discount is offered to all capacity products, without any special terms and conditions applying to different products.

Details on the offering of capacity are provided in the description of measure [Tender of capacities](#).

Key takeaways

- There is only one underground storage facility in Belgium (Loenhout) with a capacity of 7.6 TWh, corresponding to just 5% of annual consumption.
- Belgium has succeeded so far in meeting the filling trajectories and target, set in the Gas Storage Regulation. The national targets (including a 90% filling level on November 1st) were also fulfilled. In fact, the storage facility was full, from the beginning of October to early December 2022.
- Security of supply measures involving the use of the storage facility were already in place in Belgium prior to the Gas Storage Regulation. These relate to tendering of storage capacity with obligations for storage filling to the storage users, and to offering capacity products at discount.
- The storage users that contract seasonal services have obligations to maintain specific levels of gas in storage at indicated control points, including 90% on November 1st of each year. In 2022 the control points were expanded, to include the trajectories of the Gas Storage Regulation. Users not meeting these obligations are charged with penalties.
- Fluxys, in its capacity as SSO, monitors the filling levels of each storage user and reports accordingly to CREG. Aggregate information on the storage filling is published by Fluxys.
- Discounts apply to the storage capacity offered in auctions, as the reserve price may be set below the regulated price (taking into account the summer-winter spread), to incentivize market participants to use the storage capacity. Any potential deficit of the SSO, due to offering capacity below the regulated tariff, is covered by the regularization account.
- The use-it-or-lose-it mechanism was revised in 2022, introducing check points to ensure that the booked capacity is utilized to meet the filling targets. The SSO monitors whether injection capacity is used sufficiently to ensure meeting the filling trajectories and targets. If not, the SSO may release the unused capacity at the market. The allocation mechanism is decided by the Ministry of Economic Affairs - Department of Energy and CREG, following a proposal by the SSO. The measure has not been used yet.

Bulgaria

Overview

Gas storage infrastructure (August 1 st , 2023)	
Aggregate GWV	5.9 TWh
Injection capacity	41.2 GWh/d
Withdrawal capacity	40.9 GWh/d

Storage filling targets of Gas Storage Regulation and actual gas in storage					
2022			2023		
	Target	Actual		Target	Actual
1 August	49%	48%	1 February	45%	82%
1 September	61%	62%	1 May	29%	78%
1 October	75%	76%	1 July	49%	88%
1 November	80%	90%	1 September	71%	94%
			1 November	90%	N/A

Measures applied in the MS for gas storage			
a) Minimum volume in gas storage	✓*	f) Financial incentives for market participants	
b) Tender of capacities		g) Unused booked capacities	
c1) Balancing stock managed by TSO		h) Strategic storage	✓*
c2) Obligations imposed on designated entities		i) Appointment of dedicated entity	
d) Coordinated instruments		j) Discounts on storage tariffs	
e) Voluntary joint procurement mechanisms		k) Capital and operational expenditures	
Other			

* Measure in place prior to the Gas Storage Regulation and not amended in 2022

Applicable legal and regulatory framework

The Energy Act¹¹³ put in place provisions for using Bulgaria's underground storage facility for security of supply purposes before 2022 and the setting of filling targets by the Gas Storage Regulation. Additionally, the Emergency Plan (latest update published in 2022¹¹⁴) includes measures that are associated with storage filling.

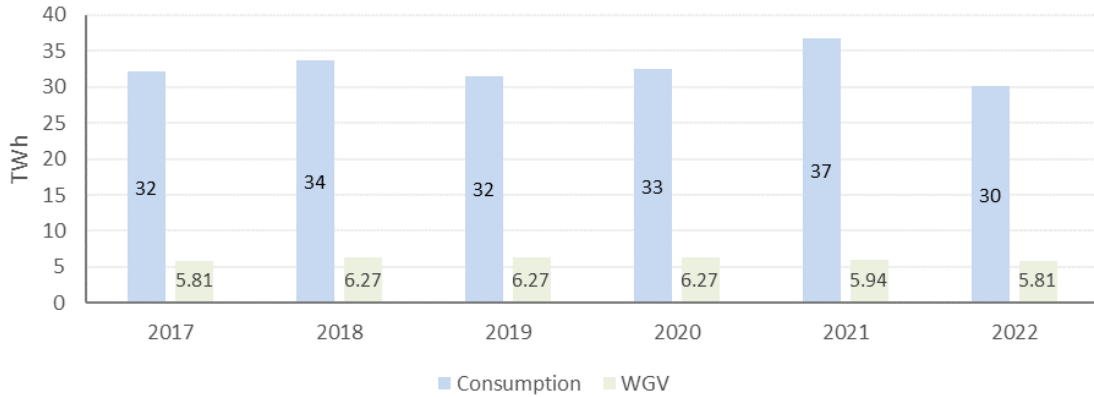
¹¹³ [Link](#) to the Energy Act.

¹¹⁴ [Link](#) to the Emergency Plan.

Gas storage infrastructure

The underground gas storage infrastructure in Bulgaria has a total gas working volume of 5.9 TWh, withdrawal capacity of 40.9 GWh/d and injection capacity of 41.2 GWh/d¹¹⁵. Storage capacity available in Bulgaria corresponds to around 20% of the country’s annual consumption. Figure 25 shows how the storage capacity compares to the annual consumption for the period 2017 to 2022.

Figure 25: Storage capacity and annual gas consumption from 2017 to 2022¹¹⁶



Bulgaria has a single underground gas storage facility (Chiren). Its location is presented in the map below.

Figure 26: Underground gas storage facilities in Bulgaria¹¹⁷



The storage facility in Bulgaria is operated by Bulgartransgaz. The technical characteristics of the storage facility are presented in Table 66.

Table 66: Gas storage operators and infrastructure

Name	GWV (TWh)	Injection (GWh/d)	Withdrawal (GWh/d)
Bulgartransgaz (Chiren)	5.9	41.23	40.91

¹¹⁵ Source: GIE.

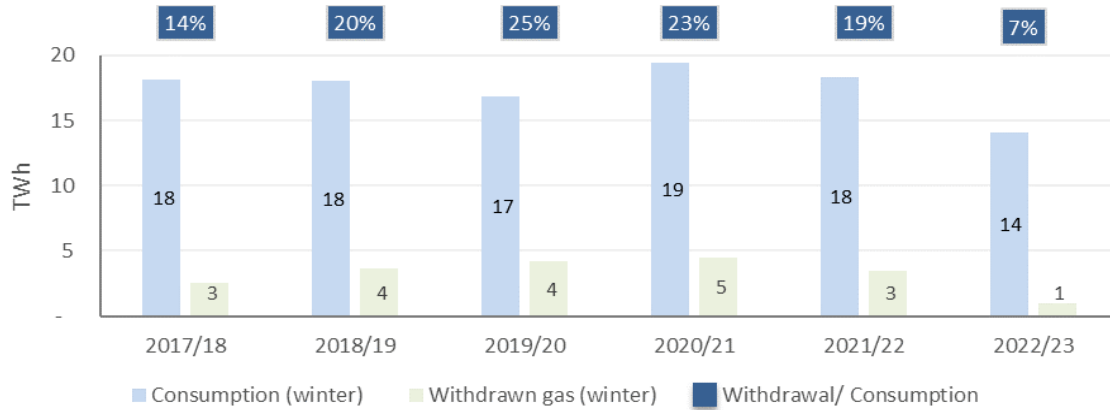
¹¹⁶ Sources: GIE, Eurostat.

¹¹⁷ Source: GIE Storage Map.

Gas storage operation and filling targets

Gas withdrawn from the Bulgarian storage facility during the winter period (November of one year to March of the next), between 2017/18 and 2022/23, was significantly lower than gas demand of the same period, ranging from 7% to 25%. However, that should be expected as Chiren does not operate (yet) as a commercial storage facility (Figure 27).

Figure 27: Use of gas storage to cover demand in the winter season¹¹⁸



The filling targets and trajectories for Bulgaria in 2022 and 2023, as established in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301, are presented in the Table below. No national targets have been set, different from those in the Gas Storage Regulation.

Table 67: Targets and trajectories for Bulgaria in 2022 and 2023¹¹⁹

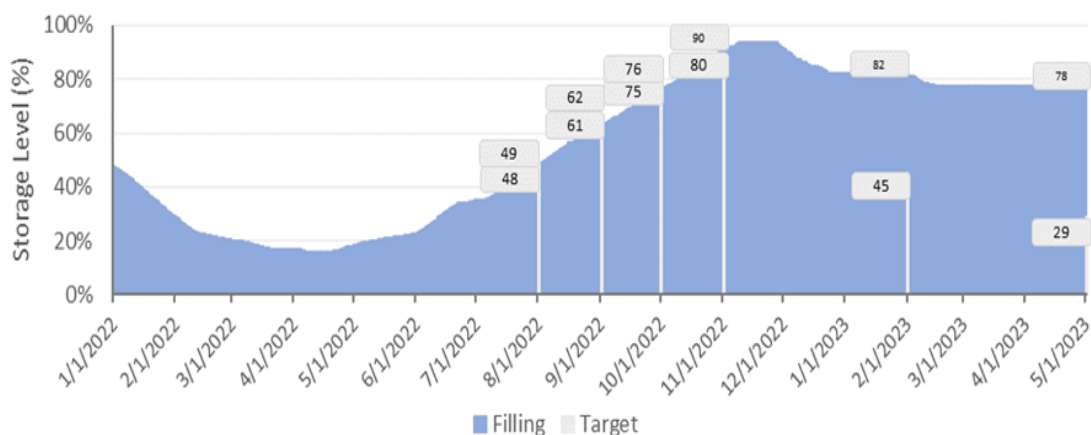
2022	1 August	1 September	1 October	1 November	
	49%	61%	75%	80%	
2023	1 February	1 May	1 July	1 September	1 November
	45%	29%	49%	71%	90%

Although Bulgaria did not meet the first filling trajectory on August 1st, 2022 (while being very close, with the trajectory being 49% and the actual filling level at 48%), the country has since been successful in meeting the EC Gas Regulation trajectories and targets. It is worth noting that in 2023, the actual filling has remained at high levels, exceeding by far the EC requirements (Figure 28).

¹¹⁸ Source: GIE (for withdrawal) and Eurostat (for consumption).

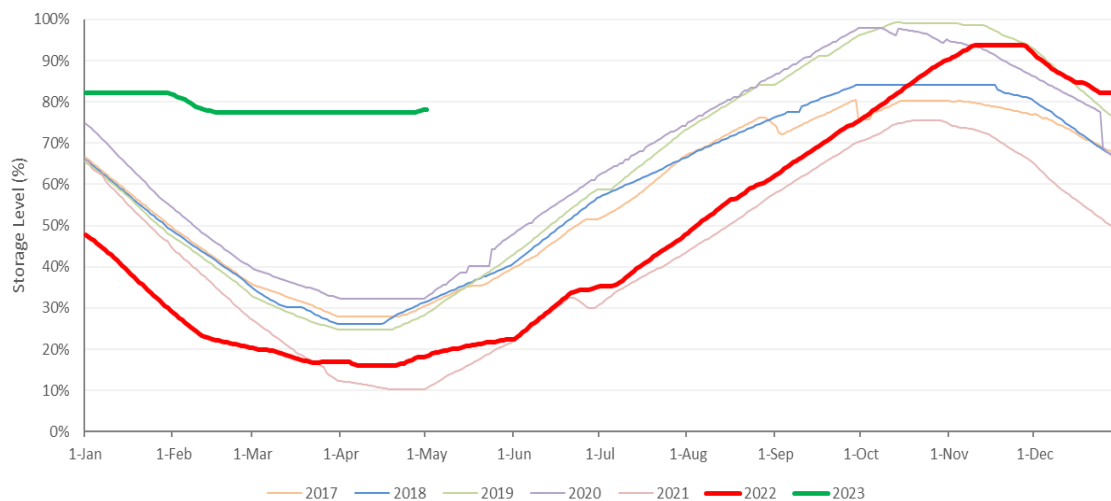
¹¹⁹ Filling trajectories and targets as stated in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301.

Figure 28: Daily gas in storage vs filling targets in 2022 and 2023¹²⁰



The storage filling in the winter of 2022 was somewhat lower than the levels observed in 2019 and 2020, but much higher than the levels in 2021. In the beginning of 2023, gas in storage remained at much higher levels compared to most previous years (Figure 29).

Figure 29: Comparison of daily gas filling trends between 2017 and 2023¹²¹



Overview of national measures

Bulgaria already had in place security of supply measures related to the use of its gas storage facility, prior to the entry into force of the Gas Storage Regulation.

It seems that no new measures relating to security of supply were implemented after the entry into force of the Gas Storage Regulation.

In brief, the pre-existing measures are described below¹²²:

- Bulgartransgaz EAD (state-owned TSO and SSO) is obligated to maintain a strategic reserve related to the security of supply and the seasonal fluctuation coverage.

¹²⁰ Source: GIE.

¹²¹ Source: GIE.

¹²² Source: 2021-2030 Ten-Year Network Development Plan of Bulgartransgaz EAD ([Link](#)).

- The market participants who have clients with irregular consumption are obliged to maintain a strategic reserve related to the security of supply and the seasonal fluctuation coverage.

The measures outlined above combine two of the measures from the list of Article 6b(1) of the Gas Storage Regulation:

Measure	Implementation	Relevance to Article 6b(1) measures
The market participants who have clients with irregular consumption are obliged to maintain a strategic reserve related to the security of supply and the seasonal fluctuation coverage.	Prior to 2022	Requiring gas suppliers to store minimum volumes of gas in storage facilities, including in underground gas storage facilities and/or in LNG storage facilities, those volumes to be determined on the basis of the amount of gas supplied by gas suppliers to protected customers (point a).
Bulgartransgaz is obligated to maintain a strategic reserve.	Prior to 2022	Adopting effective instruments for the purchase and management of strategic storage by public or private entities (point h).

These measures are analysed in detail below.

National measures implemented due to the Gas Storage Regulation

The measures applied in Bulgaria, aiming to use the country's storage facility for security of supply purposes, were already in place before 2022 and the entry into force of the Gas Storage Regulation.

National measures in place prior to the Gas Storage Regulation

Minimum volume in gas storage

Implementation of the measure

The companies that supply natural gas to end-consumers with fluctuations in seasonal consumption and the district heating utilities are required to ensure that sufficient quantities of gas are available to compensate for any fluctuation in client consumption within a range of 10% to 20% of the contracted annual quantities.

Bulgartransgaz, in its capacity as operator of the Chiren gas storage facility, is required to ensure that sufficient capacity is available for the injection, storage and withdrawal of such additional quantities with an indicative total volume of 290 mcm.

The seasonal fluctuation in supply is calculated by using a fluctuation factor (FF) as follows:

$$FF = \frac{V_s}{V_w}$$

Where:

- V_s : the quantities used in the previous year in the period between April and September.

- Vw: the quantities used in the previous year in the periods between January and March, and October and December, respectively.

When FF is less than 0.6, supply is deemed to fluctuate, and in all other cases to be even.

In the event of failure to fulfil the obligations which may jeopardize the integrity and safe operation of the gas transmission system, Bulgartransgaz EAD undertakes measures pursuant to the provisions of Section VI of the Rules for management and technical operation of gas transmission networks of September 3rd, 2013, adopted by the EWRC.

Recovery of costs associated with implementation of the measure

The suppliers with clients with fluctuations in seasonal consumption recover the costs from the implementation of the measure via the gas price charged to their final customers.

Monitoring and transparency

In order to verify the information, set out in the contracts for gas supply to clients with seasonal fluctuations in consumption, the suppliers with such clients are required to provide to the competent authority the contract (with commercially sensitive information redacted). This gives an indication of the storage and injection capacity requirements of these supplier to fulfil their obligations.

Strategic storage

Implementation of the measure

If necessary, Bulgartransgaz may store natural gas quantities in Chiren UGS up to a maximum volume of 70 mcm, upon order by the Minister of Energy, issued pursuant to Art. 70 of the Energy Act imposing additional public service obligations. The quantities specified in the order constitute a reserve necessary to ensure continuity of supply in accordance with Annex VIII to Regulation (EU) 2017/1938.

In case the above quantities are withdrawn, they should be recovered by the users of the gas transmission network in the following order:

- If technologically possible, gas quantities within three months during the injection period and after cancelling the emergency situation level.
- By paying the value of gas, within one calendar month, counted after cancelling the emergency level.

Recovery of costs associated with implementation of the measure

The costs incurred by Bulgartransgaz for establishing and maintaining gas reserves are reimbursed through the gas transmission tariffs (Art. 35 of the Energy Act).

In November 2022, it appears that Bulgartransgaz EAD received a loan from the European Bank for Reconstruction and Development (EBRD) to acquire natural gas for the accumulation and/or replenishing of the national gas reserve. The loan was guaranteed by the State¹²³.

Key takeaways

- There is only one underground storage facility in Bulgaria (UGS Chiren) with a capacity of 5.9 TWh, corresponding to below 20% of annual consumption.

¹²³ Source: European Bank for Reconstruction and Development ([Link](#)).

- After not meeting the first filling trajectory on August 1st, 2022 (albeit being very close), the country has since been successful in meeting the EC Gas Regulation trajectories and targets. On November 1st, 2022, the filling level was 90% and has remained high throughout 2023 so far.
- Bulgaria already had security of supply measures involving Chiren storage before the Gas Storage Regulation. These include:
 - Setting an obligation to market participants supplying consumers with irregular consumption to maintain a strategic reserve, between 10% and 20% of the contracted annual quantities. Bulgartransgaz must ensure availability of capacity for market participants to meet their obligations. Relevant costs incurred by the market participants are recovered through the end-user gas prices.
 - Bulgartransgaz is obligated to maintain a strategic reserve related to the security of supplies and the seasonal fluctuation coverage, up to a maximum of 70 mcm, upon order by the Minister of Energy. Relevant costs by Bulgartransgaz are collected through the transmission tariff.

Croatia

Overview

Gas storage infrastructure (August 1 st , 2023)	
Aggregate GWV	4.77 TWh
Injection capacity	43.9 GWh/d
Withdrawal capacity	51.6 GWh/d

Storage filling targets of Gas Storage Regulation and actual gas in storage					
	2022			2023	
	Target	Actual		Target	Actual
1 August	49%	54%	1 February	46%	85%
1 September	60%	78%	1 May	29%	73%
1 October	70%	91%	1 July	51%	92%
1 November	80%	97%	1 September	83%	97%
			1 November	90%	N/A

Measures applied in the MS for gas storage			
a) Minimum volume in gas storage	✓	f) Financial incentives for market participants	
b) Tender of capacities		g) Unused booked capacities	
c1) Balancing stock managed by TSO	✓*	h) Strategic storage	
c2) Obligations imposed on designated entities	✓	i) Appointment of dedicated entity	
d) Coordinated instruments		j) Discounts on storage tariffs	
e) Voluntary joint procurement mechanisms		k) Capital and operational expenditures	
Other			

* Measure applied prior to the Gas Storage Regulation

Applicable legal and regulatory framework

The regulatory framework in Croatia was supplemented in 2022, to introduce security of supply measures that involved utilization of the country's underground storage facility. The new measures were introduced through the following:

- Decision no. 63/22¹²⁴ of June 3rd, 2022, on securing gas supplies on the territory of the Republic of Croatia. It sets obligatory filling levels for suppliers and obligations for the Hrvatska Elektroprivreda dd (HEP) in order to secure gas supplies, for storage year 2022/23¹²⁵.

¹²⁴ [Link](#) to Official Gazette, no. 63/22.

¹²⁵ The storage year in Croatia is from April 1st of a year to March 31st of the next year.

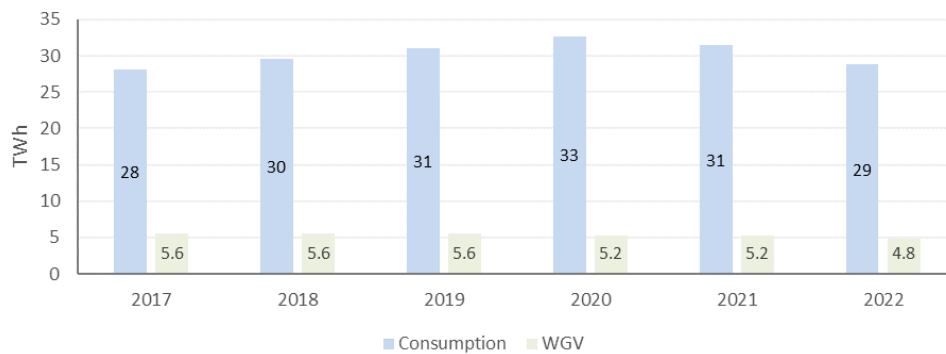
- Decision no. 37/23¹²⁶ of March 31st, 2023, on securing gas supplies on the territory of the Republic of Croatia for the heating season 2023/2024. It sets obligatory filling levels for suppliers and obligations for HEP in order to secure gas supplies, for storage year 2023/24.
- Decision no. 127/2022¹²⁷ of October 31st, 2022, on adopting Croatia’s Intervention Plan concerning measures to safeguard the security of gas supply.

Before 2022, the Gas Market Act¹²⁸ (“Official Gazette”, no. 18/18) assigned to the TSO, Plinacro, the option of storing gas at the underground facility for operational and balancing purposes of the transmission system. The measure was not revised in 2022.

Gas storage infrastructure

The underground gas storage infrastructure in Croatia has a total gas working volume of 4.77 TWh, withdrawal capacity of 51.57 GWh/d and injection capacity of 43.87 GWh/d¹²⁹. Storage capacity in Croatia corresponds to below 20% of the country’s annual consumption. Figure 30 shows how the storage capacity compares to the annual consumption for the period 2017 to 2022.

Figure 30: Storage capacity and annual gas consumption from 2017 to 2022¹³⁰



There is one underground storage facility in Croatia, UGS Okoli, the location of which is presented in the map below.

Figure 31: Underground gas storage facilities in Croatia¹³¹



¹²⁶ [Link](#) to Official Gazette, no. 37/23.

¹²⁷ [Link](#) to decision 127/2022.

¹²⁸ [Link](#) to the amendment of the Natural Gas Act (Official Gazette, no. 18/18).

¹²⁹ Source: PSP (August 1st, 2023).

¹³⁰ Sources: GIE, Eurostat.

¹³¹ Source: GIE Storage Map.

The storage facility in Croatia is operated by PSP d.o.o. Its technical characteristics are shown in Table 68.

Table 68: Gas storage operators and infrastructure¹³²

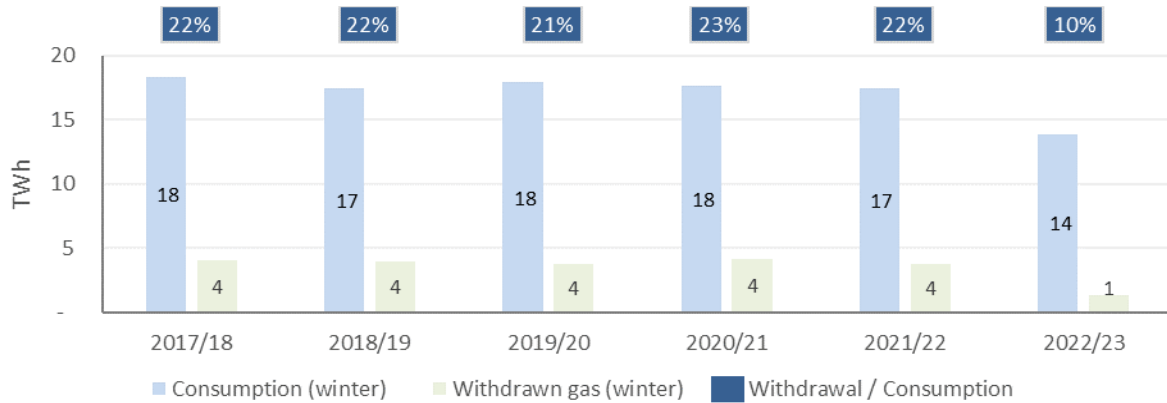
Name	GWV (TWh)	Injection (GWh/d)	Withdrawal (GWh/d)
PSP d.o.o. (Okoli UGS)	4.77	43.87	51.57

In addition to the underground gas storage facilities, Croatia can also store LNG at Krk FSRU, which has a total storage capacity of 140,206 m³ LNG¹³³.

Gas storage operation and filling targets

Between 2017 and 2021, gas withdrawals from the Croatian storage facility in the winter period (November of one year to March of the next) corresponded to around 20% of gas demand. However, in the winter of 2022, this share was halved to 10% (Figure 32).

Figure 32: Use of gas storage to cover demand in the winter season¹³⁴



The filling targets and trajectories for Croatia in 2022 and 2023, as established in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301, are presented in the Table below. Croatia has the legal possibility to count stocks stored at the Krk FSRU towards the fulfilment of the filling target might (Article 6a(5) of the Gas Storage Regulation).

Table 69: Targets and trajectories for Croatia in 2022 and 2023¹³⁵

2022	1 August	1 September	1 October	1 November	
	49%	60%	70%	80%	
2023	1 February	1 May	1 July	1 September	1 November
	46%	29%	51%	83%	90%

¹³² Source: PSP (August 1st, 2023).

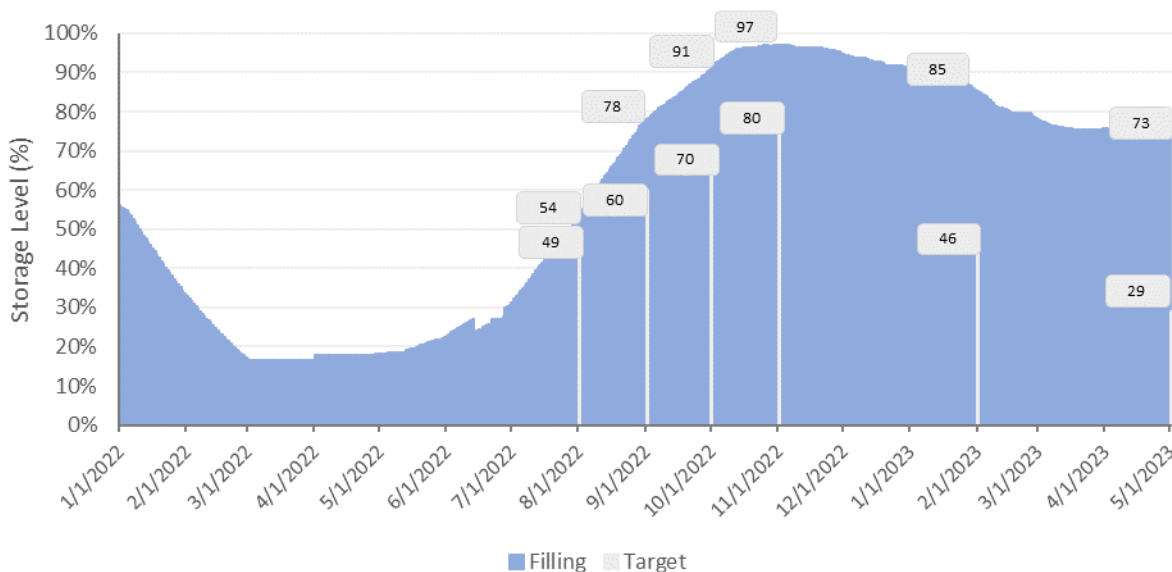
¹³³ Source: LNG Croatia.

¹³⁴ Source: PSP (for withdrawal) and Eurostat (for consumption).

¹³⁵ Filling trajectories and targets as stated in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301.

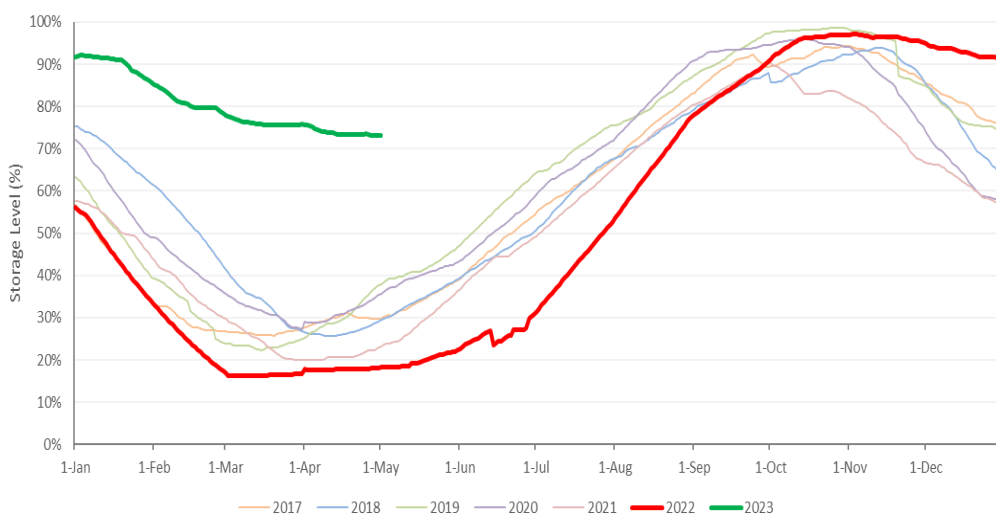
Croatia has succeeded in meeting and even exceeding the EC Gas Regulation storage filling trajectories and targets for 2022 and 2023 so far, as shown in Figure 33. On November 1st, 2022, the filling level reached 97%, and has remained high so far in 2023.

Figure 33: Daily gas in storage vs filling targets in 2022 and 2023¹³⁶



Until the start of the winter period, the filling level in 2022 followed approximately the same pattern with the period 2017 – 2021. However, after November 2022, and throughout 2023 so far, filling levels have remained considerably higher than in the past years. Overall, measures implemented in 2022 appear to have resulted in high stock levels in storage compared to the previous 5 years (Figure 34).

Figure 34: Comparison of daily gas filling trends between 2017 and 2022¹³⁷



The storage tariffs of PSP remained relatively stable between 2022 and 2023. Compared to 2021, there was a decrease of 23% in the charges for injection and withdrawal (Table 70).

¹³⁶ Source: PSP.

¹³⁷ Source: PSP.

Table 70 Evolution of tariffs for annual storage products¹³⁸

Tariff item	2017	2018	2019	2020	2021	2022	2023
Standard storage capacity package (€/SBU)	177,728	175,805	173,904	172,022	170,161	163,606	167,419
Injection capacity (€/KWh/day)	0.1625	0.1607	0.1590	0.1573	0.1556	0.1195	0.1223
Withdrawal capacity (€/KWh/day)	0.1300	0.1286	0.1272	0.1258	0.1245	0.0956	0.0978
Working Volume (€/KWh/day)	0.0027	0.0027	0.0027	0.0026	0.0026	0.0024	0.0025

Overview of national measures

Croatia has introduced new measures directed to market participants, to increase utilization of its underground storage facility, while at the same time continued to provide to the TSO the possibility to maintain stocks for balancing and operational gas.

A measure applied to storage year 2022/23 (and extended for the storage year 2023/24) obligated gas suppliers holding storage capacity to maintain a minimum amount of gas in the facility on specific days. They must keep a 63% filling level on August 1st, 74% on October 1st and 90% on November 1st.

As an additional measure, again for storage years 2022/23 and 2023/24, HEP, as a market participant, must establish gas stocks at the storage facility. These stocks will cover the needs of households that use public service gas supply, customers of thermal energy from an independent heating system and for other protected gas customers.

Furthermore, since before 2022, the TSO had the option of using the storage facility to store gas quantities for the purpose of the technical operation of the transmission system.

The mechanism outlined above combines three measures from the list of Article 6b(1) of the Gas Storage Regulation:

Measure	Implementation	Relevance to Article 6b(1) measures
Gas suppliers with storage capacity are obligated to maintain minimum gas quantities in storage on specific days.	Introduced for storage year 2022/23 and prolonged for year 2023/24	Requiring gas suppliers to store minimum volumes of gas in storage facilities, including in underground gas storage facilities and/or in LNG storage facilities, those volumes to be determined on the basis of the amount of gas supplied by gas suppliers to protected customers (point a).
The TSO is entitled to store gas for the optimal technical management of the transmission system.	2020	Requiring transmission system operators or entities designated by the Member State to purchase and manage balancing stock exclusively for carrying out their functions

¹³⁸ Source: PSP Tariffs and prices ([Link](#)).

		as transmission system operators (point c1).
HEP was granted a loan up to the amount of 400 € mil. for securing 270.83 million m ³ which will be sustained to cover the needs of households that use public service gas supply, for customers of thermal energy from an independent heating system and for other protected gas customers	Introduced for storage year 2022/23 and prolonged for year 2023/24	Appointing a dedicated entity tasked with meeting the filling target in the event that the filling target would not otherwise be met (point i).

These measures are analysed in detail below.

It should be noted that the capacity at the gas storage facility is allocated through tenders. This mechanism, however, has been in place before 2022, and was not established in order to increase storage filling, in line with the Gas Storage Regulation requirements. Therefore, this is not examined as a measure corresponding to point (b) of Article 6b(1) of the Gas Storage Regulation (tender of capacities) within the scope of this Study.

National measures implemented due to the Gas Storage Regulation

Minimum volume in gas storage (point (a) of Article 6b)

Implementation of the measure

In 2022, Decision no. 63/22 set an obligation to suppliers holding storage capacity to establish and maintain gas stocks, which they need to keep at certain level on specified dates during the storage year 2022/23. This measure was extended with Decision no. 37/23, prolonging its validity for the storage year 2023/24.

The filling targets correspond to a share of the storage user's contracted capacity: 63% on August 1st, 74% on October 1st and 90% on November 1st (for both storage years 2022/23 and 2023/24). Storage users may deviate up to a maximum of 5% from these targets. The storage users can use their stocks freely, as long as then achieve the minimum filling on each target date.

As an incentive to increase storage filling, the Croatian Energy Regulatory Agency (HERA) has approved (before 2022 and in accordance with NC TAR) discounts to the transmission tariffs for the entry-exit point to the underground storage facility (100% for the exit and 90% for the entry).

Prior to carrying out their obligations under this measure, the market participants inform the SSO on the booked capacity that they intend to fill. Their remaining unused capacity is assigned to HEP, the entity responsible for safeguarding the country's security of supply. Charges for the capacity released and assigned to HEP are paid by the latter.

In case the SSO considers that there is a risk of the storage facility not being filled adequately to meet the targets, it informs the Ministry of Economy and Sustainable Development, and proposes a procedure for the transfer and/or leasing of the unused capacity.

Recovery of costs associated with implementation of the measure

Each supplier is responsible for procuring gas and capacity to establish its own gas stocks. The relevant costs are recovered from the supplier's customers. For the capacity surrendered back to the SSO by the suppliers, HEP was assigned the released capacity and respective storage charges.

Monitoring and transparency

The SSO is obligated, according to the intervention plan, to inform the Ministry of Economy and Sustainable Development and, upon request, the crisis team¹³⁹ about the level of gas stocks. By August 5th and October 5th of storage years 2022/23 and 2023/24 the SSO must report on the booked and used capacity of each storage user.

Effects on the gas market

The suppliers could voluntarily decide about the amount of capacity they would surrender. The possibility to surrender the capacity resulted in lower flexibility and revenues for some suppliers, however due to negative price spreads, their decision protected their profit margins.

Difficulties and risks with the implementation of the measure

Due to the high gas prices in 2022, some market participants opted to surrender their unused capacity to HEP (to be used as described in measure [Obligations imposed on designated entities](#)).

Application of the measure in 2022/23

Although the impact of this measure on the filling levels is not evident, it should be highlighted that the country's filling rate surpassed the EC target and reached 97% on November 1st, 2022.

Appointment of dedicated entity (point (i) of Article 6b)

Implementation of the measure

Another measure introduced with Decision no. 63/22 for storage year 2022/23 was the assignment to HEP (as a participant of the gas market) to establish reserves of 270.8 mcm. The stored gas should be withdrawn according to the orders of the crisis team for implementation of the intervention plan.

The measure was prolonged to storage year 2023/24, with Decision no. 63/22, and HEP has to establish the same quantity as in storage year 2022/23. This quantity should be sold by HEP during the heating season 2023/24 (November 1st, 2023, to March 31st, 2024) to households that use public service gas supply, customers of thermal energy from an independent heating system, and other protected gas customers.

Storage users that did not use their booked capacity were given the option to sell their capacity to HEP, so that the latter can store its gas stock obligations.

Recovery of costs associated with implementation of the measure

For the purpose of procuring the required gas quantities, a loan was granted to HEP, up to the amount of 400 mil. €. The Government issued a state guarantee for this loan. Additional funds were provided to HEP by the State budget, to cover the difference between the purchase and sale price of gas, storage costs and financing costs.

¹³⁹ A team comprising representatives from various institutions (Ministry, HERA, TSO, SSO, LNG operator, DSOs, market operator, etc.), that is responsible for implementing the intervention plan and monitor its measures.

Monitoring and transparency

The Ministry of Economy and Sustainable Development is responsible for monitoring the implementation of the measure. HEP must submit reports concerning the situation and measures taken regarding the security of gas supply to protected customers. Information related to the measure is not published by HEP.

Effects on the gas market

According to HERA, the implementation of the measure secured gas supply for all customers and supply under reasonable prices for protected customers. It also secured gas in gas storage for 2022 and 2023.

Difficulties and risks with the implementation of the measure

No difficulties or risks with the implementation of the measure were reported.

Application of the measure in 2022/23

In 2022 HEP procured the required 270.8 mcm. This quantity remained in storage in 2023/24 as the crisis team did not require this gas to be withdrawn.

National measures in place prior to the Gas Storage Regulation

Balancing stock managed by TSO (point (c1) of Article 6b)

Implementation of the measure

The Gas Market Act gives the TSO, Plinacro, the option to store in the storage facility gas quantities needed for the optimal technical management of the transmission system (operational stock). These quantities are used inter alia for own consumption, consumption at the transmission system's facilities, compensation for gas losses, etc. The operational stock is currently equal to 1 Standard Business Unit (SBU) of storage capacity (the capacity product offered by PSP)), which equals to 50 GWh.

The TSO acts as any market participant and has to participate in auctions for storage capacity booking. The TSO may withdraw gas from the operational stock when needed.

Recovery of costs associated with implementation of the measure

The cost for establishing and maintaining the operational stock is recovered by the TSO as part of the regulated transmission tariff, charged to all system users.

Monitoring and transparency

As this measure is defined as an option and not an obligation for the TSO, the monitoring responsibility is not specially envisaged in the Gas Market Act.

Effects on the gas market

No impact of the measure on the gas market has been reported.

Difficulties and risks with the implementation of the measure

No difficulties or risks with the implementation of the measure were reported.

Application of the measure in 2022/23

The measure had minor impact in meeting the filling targets, since the TSO holds only 1 SBU (50 GWh) out of 86 available in total at the storage facility.

Key takeaways

- There is only one underground storage facility in Croatia (UGS Okoli) with a capacity of 4.8 TWh, corresponding to 20% of annual consumption.
- Croatia has succeeded so far in meeting the filling trajectories and targets, set in the Gas Storage Regulation (no national targets other than those in the Regulation have been set). On November 1st, 2022, the filling level was 97%. So far in 2023, the filling levels are much higher than the foreseen trajectories.
- The measures implemented in 2022 appear to have resulted in high stock levels in storages compared to the previous 5 years, especially after November 2022.
- Croatia introduced new measures in 2022, with a view to enhancing security of supply and ensuring high storage filling levels:
 - An obligation was assigned to storage users, to keep in storage minimum gas quantities on August 1st (63%), October 1st (74%), and November 1st (90%). The measure initially applied for storage year 2022/23 and then was extended for year 2023/24. As an incentive for storage filling, a discount is offered to the transmission tariffs to/from the storage facility. The actual contribution of this measure to the filling targets cannot be deduced, as apart from meeting the obligation, storage users utilize their capacity for commercial purposes.
 - HEP was obligated to establish during storage year 2022/23 a gas reserve of 270.8 mcm in the storage facility, which remained in storage in 2023. The stored gas should be withdrawn within the frame of implementing the intervention plan. HEP is able to sell the gas volumes to the protected customers during the 2023/24 heating season. To cover its expenses, HEP was granted a loan of up to 400 mil. €, with state guarantees. Additional funds could be made available from the State budget.
- The Ministry of Economy and Sustainable Development is responsible for monitoring the implementation of both measures.
- Due to the high gas prices in 2022, some storage users opted-in to the possibility given to transfer their capacity to HEP, instead of meeting their stockholding obligation.
- An additional measure that was in place prior to 2022 is giving the TSO the option to store in the storage facility gas stocks to be used for operational purposes of the transmission system. These stocks amount to 50 GWh of gas.

Czech Republic

Overview¹⁴⁰

Gas storage infrastructure (August 1 st , 2023)	
Aggregate GWV	37.5 TWh
Injection capacity	434.7 GWh/d
Withdrawal capacity	611.3 GWh/d

Storage filling targets of Gas Storage Regulation and actual gas in storage					
	2022			2023	
	Target	Actual		Target	Actual
1 August	60%	81%	1 February	45%	73%
1 September	67%	84%	1 May	25%	51%
1 October	74%	89%	1 July	30%	85%
1 November	80%	98%	1 September	60%	95%
			1 November	90%	N/A

Measures applied in the MS for gas storage			
a) Minimum volume in gas storage	✓*	f) Financial incentives for market participants	✓
b) Tender of capacities		g) Unused booked capacities	✓
c1) Balancing stock managed by TSO		h) Strategic storage	✓*
c2) Obligations imposed on designated entities	✓*	i) Appointment of dedicated entity	
d) Coordinated instruments		j) Discounts on storage tariffs	
e) Voluntary joint procurement mechanisms		k) Capital and operational expenditures	
Other	100% Discount on transmission tariff to storage		

* Measure in place prior to the Gas Storage Regulation and not amended in 2022

Applicable legal and regulatory framework

In 2022 the regulatory framework in the Czech Republic was amended, to ensure that the storage filling obligations under the Gas Storage Regulation would be met. The main documents include:

¹⁴⁰ The underground storage facility Dolni Bojanovice is not connected to the Czech gas system, and the Czech obligations and rules do not apply to it. For this reason, all the figures presented in this Section do not include this storage facility.

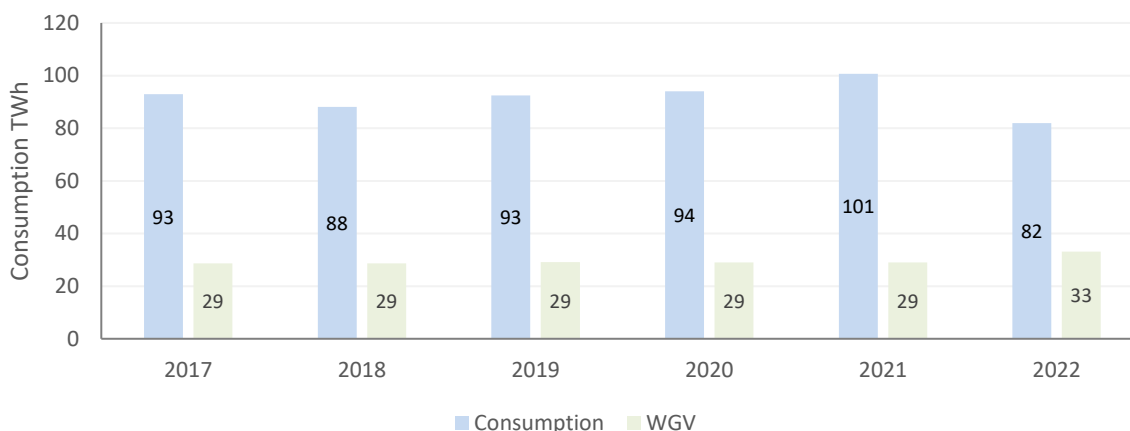
- The Energy Act No. 458/2000¹⁴¹, amended by Act No. 232/2022¹⁴² with regards to its content on the state of emergency in the gas industry and on the method of ensuring the safety standard of gas supply.
- Decree No. 344/2012¹⁴³, by the Ministry of Industry and Trade, on the state of emergency in the gas industry and on the method of ensuring the safety standard of gas supply, which was amended by Decree No. 224/2022¹⁴⁴, to implement the requirements of the Gas Storage Regulation.
- Decree No. 349/2015¹⁴⁵, by the Energy Regulatory Office (ERÚ) on the gas market rules, that was amended with Decree No.223/2022¹⁴⁶.

Additionally, Act No.97/1993¹⁴⁷ established the Administration of State Material Reserves, which inter alia is responsible for establishing gas reserves.

Gas storage infrastructure

The underground gas storage infrastructure in Czech Republic has a total gas working volume of 37.5 TWh, withdrawal capacity of 611.3 GWh/d and injection capacity of 434.7 GWh/d¹⁴⁸. Storage capacity in the Czech Republic corresponded to around 40% of the country's annual consumption in 2022, while this share remained around 30% for the previous five years. Figure 35 shows how the storage capacity compares to the annual consumption for the period 2017 to 2022.

Figure 35: Storage capacity and annual gas consumption from 2017 to 2022¹⁴⁹



Czech Republic has a total of nine underground gas storage facilities, of which 8 are connected to the Czech entry-exit zone. Storage facilities are operated by MND Energy Storage, Moravia Gas Storage, Gas Storage CZ and SPP Storage. It is noted that the UGS operated by SSP Storage (Dolni Bojanovice) is

¹⁴¹ [Link](#) to Act No. 458/2000.

¹⁴² [Link](#) to Act No.232/2022.

¹⁴³ [Link](#) to Decree No.344/2012.

¹⁴⁴ [Link](#) to Decree No.224/2022.

¹⁴⁵ [Link](#) to Decree No.349/2015.

¹⁴⁶ [Link](#) to Decree No.223/2022.

¹⁴⁷ [Link](#) to Act No.97/1993.

¹⁴⁸ Source: GIE (August 1st, 2023).

¹⁴⁹ Values for annual consumption are sourced from Eurostat.

physically connected only to the Slovak entry-exit zone, and therefore does not contribute to the security of supply of the Czech gas market. The storage facilities operated by Gas Storage CZ are grouped together in a single Virtual Gas Storage (VGS). The locations of the country's facilities are presented in the map below. The technical characteristics of the facilities of each SSO are presented in Table 71.

Figure 36: Underground gas storage facilities in Czech Republic¹⁵⁰



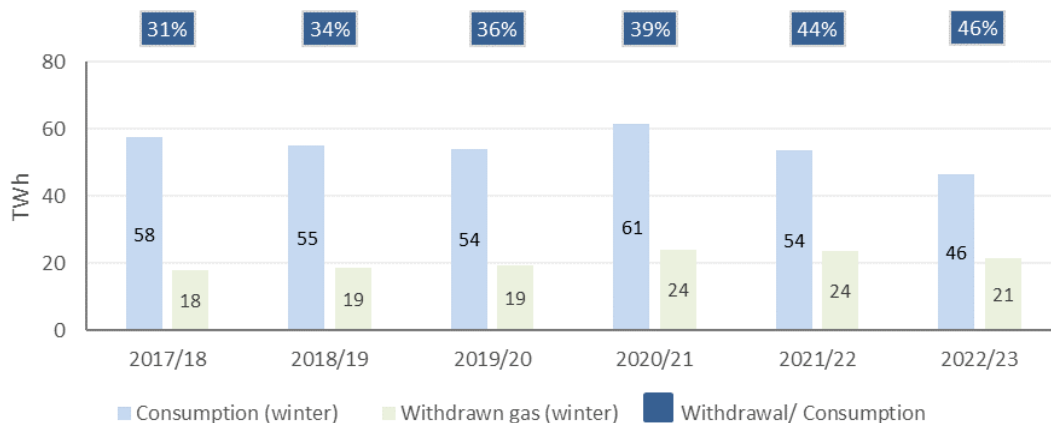
Table 71: Gas storage operators and infrastructure¹⁵¹

Name	GWV (TWh)	Injection (GWh/d)	Withdrawal (GWh/d)
MND Energy Storage (UGS Uhřetice)	3.64	59	107
Moravia Gas Storage (UGS Dambořice)	4.84	55	80.2
Gas Storage CZ (VGS GS CZ)	28.98	320.7	424.1

Gas storage operation and filling targets

During the winter periods (November of one year to March of the next) of 2021 and 2022, gas withdrawals from the Czech underground storages accounted for over 45% of gas demand during that period. Between 2017 and 2020 this share was lower, ranging from around 30% to 40% (Figure 37).

Figure 37: Use of gas storage to cover demand in the winter season¹⁵²



¹⁵⁰ Source: GIE Storage Map.

¹⁵¹ Source: GIE.

¹⁵² Source: GIE (for withdrawal) and Eurostat (for consumption).

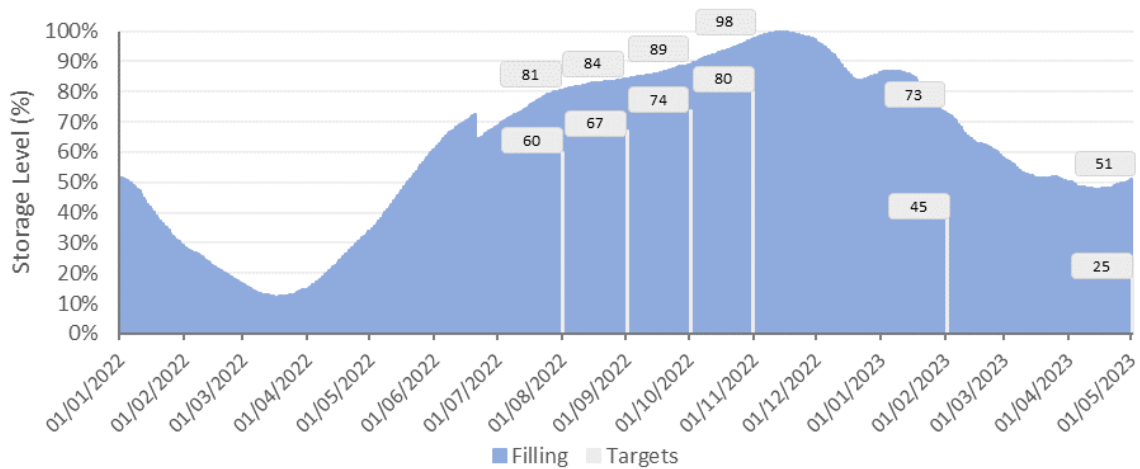
The filling targets and trajectories for Czech Republic in 2022 and 2023, as established in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301, are presented in the Table below. Czech Republic has also set slightly different national targets for some of the milestones before the Gas Storage Regulation came into force. According to ERÚ, for February 1st and May 1st, 2023, for which the national targets are lower, the trajectories of the Gas Storage Regulation will apply.

Table 72: Targets and trajectories for Czech Republic in 2022 and 2023¹⁵³

2022	1 August		1 September		1 October		1 November						
	EC	NT ¹⁵⁴	EC	NT	EC	NT	EC	NT					
	60%		67%		74%		80%				90%		
2023	1 February		1 May		1 July		1 September		1 November				
	EC	NT	EC	NT	EC	NT	EC	NT	EC	NT			
	45%		30%		25%		5%		30%		60%		90%

Czech Republic has succeeded in meeting the EC Gas Regulation storage filling trajectories and targets for 2022 and 2023 so far (Figure 38). On November 1st, 2022, the filling level reached 98%, and has continued to remain significantly above the filling trajectories in 2023, so far.

Figure 38: Daily gas in storage vs filling targets in 2022 and 2023^{155,156}



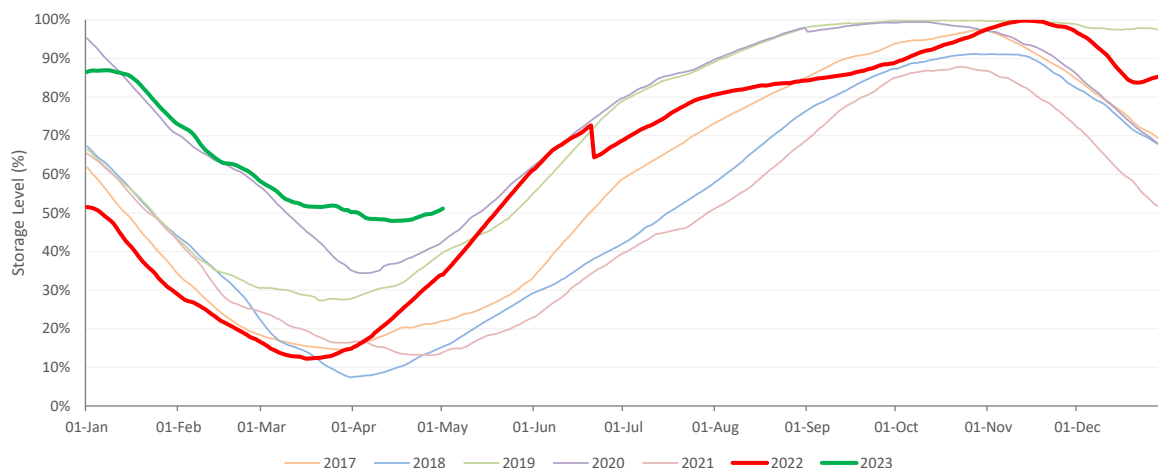
Gas in storage during 2022/23 reached the same maximum volumes with the pre-2021 period, but with a lag, as higher filling levels were observed in November (Figure 39). Implementation of the measures in 2022 appears to have contributed to the increasing storage filling compared to those observed in 2021.

¹⁵³ Filling trajectories and targets as stated in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301 and Decree No. 344/2012 Coll. on States of Emergency in the Gas Industry and on Safeguarding a Security of Supply Standard.

¹⁵⁴ EC: European Regulation 2022/2301, European Regulation 2022/1032, and NT: National Target.

¹⁵⁵ Source: GIE, MGS.

¹⁵⁶ Where targets from the Gas Storage Regulation and national targets apply, the highest is reported.

Figure 39: Comparison of daily gas filling trends 2017 until 2023¹⁵⁷

Overview of national measures implemented for the Gas Storage Regulation

The Czech Republic is implementing a combination of old and new measures, that utilize the country's underground storage facilities to enhance security of supply.

A measure was already in place prior to 2022, requiring Czech natural gas traders that supply protected customers to maintain gas reserves in the storage facilities, with a view to meeting the supply standard set by EU Regulation 2017/1938. This obligation concerns keeping stocks corresponding to 30 days of exceptionally high gas demand of those customers base, to be available between September 30th and April 1st, to ensure that high gas demand is met during the winter season.

The Administration of State Material Reserves (ASMR) was an entity established in the 1990s tasked, inter alia, to manage state material reserves. ASMR has established gas stocks at the storage facilities, that can be used upon approval by the Government. In 2022 the framework under which ASMR maintains gas stocks was amended, as the SSOs must provide unused and unwanted storage capacity to ASMR to meet its stockholding obligations at zero cost.

Additional measures were introduced in 2022. The storage users undertake the obligation to maintain sufficient gas in storage in accordance with the filling trajectories and targets set by the Gas Storage Regulation. In case a user does not store the required minimum quantity of gas within one of the specified time periods, the SSO may apply a use-it-or-lose-it (UIOLI) mechanism, to offer the booked but unused storage capacity in the market.

As a financial incentive for market participants to inject, or to maintain their stored gas in the storage facilities even during the injection period, premia for storage are offered (in the form of contracts for differences), covering the summer-winter spread, which are linked with obligations not to withdraw stored gas. As an additional financial measure, the State has agreed with ČEZ to purchase gas from the Eemshaven LNG terminal (at which ČEZ has booked capacity of 3 bcm/yr), when market prices fall below a certain level.

Finally, another measure in place is the provision of a 100% discount on the price for reserved transmission capacity for virtual gas storage points.

¹⁵⁷ Source: GIE, MGS.

The mechanism outlined above combines a number of measures from the list of Article 6b(1) of the Gas Storage Regulation:

Measure	Implementation	Relevance to Article 6b(1) measures
Gas traders directly supplying gas are obligated to maintain gas stocks corresponding to 30 days of exceptionally high gas demand.	Prior to 2022	Requiring gas suppliers to store minimum volumes of gas in storage facilities, including in underground gas storage facilities and/or in LNG storage facilities, those volumes to be determined on the basis of the amount of gas supplied by gas suppliers to protected customers (point a).
Storage users are obligated to store sufficient gas in the storage underground in accordance with the filling target and trajectories of the Gas Storage Regulation.	Amended in 2022	Requiring an obligation on other designated entities for the purpose of safeguarding the security of gas supply in the case of an emergency (point c.2).
Contracts for differences are offered to storage users, with the obligation not to withdraw gas from the storage facilities. Financial incentives are provided to ČEZ, for delivering gas from the Eemshaven LNG terminal to the Czech VTP.	Contracts for differences were applied only for storage year 2022/23 Incentives to ČEZ apply from 2022 onwards	Providing financial incentives for market participants, including for storage system operators, such as contracts for difference, or providing compensation to market participants for the shortfall in revenues or for costs incurred by them as a result of obligations on market participants, including storage system operators which cannot be covered by revenue (point f).
A storage user loses the right to use its storage capacity if it is underutilized. The released capacity is offered back to the market.	From 2022 onwards	Requiring storage capacity holders to use or release unused booked capacities, while still obliging the storage capacity holder not using the storage capacity to pay the agreed price for the whole term of the storage contract (point g).
The Administration State Material Reserves has undertaken to maintain natural gas stocks at the underground facilities, to be used in case of crisis.	Amended in 2022 (but not as a result of the Gas Storage Regulation)	Adopting effective instruments for the purchase and management of strategic storage by public or private entities (point h).
100% discount is offered to the transmission tariffs at the entry/exits to the storage facilities.	From 2022 onwards (until the EU Regulation changes)	National measure due to Gas Storage Regulation.

These measures are analysed in detail below.

National measures implemented due to the Gas Storage Regulation

Obligation imposed on designated entities (point (c.2) of Article 6b)

Implementation of the measure

Article 60c of the Energy Act (No 458/2000) assigns market participants that hold a contract for firm storage capacity with safeguarding security of supply. The storage users are obligated to use their booked capacity to store gas in the facility at specific time periods, corresponding to the trajectories and targets of the Gas Storage Regulation. The obligation (minimum share of gas stored by a participant) is expressed as a percentage of the total contracted firm storage capacity of the holder.

The storage users are permitted to sell the gas stocks foreseen in this measure, under the condition that any sale must not result in the user's gas in storage falling below the minimum requirement for the relevant "control day"¹⁵⁸ (i.e., the storage user is allowed to sell stored gas between two control days but is obligated to ensure that by the next control day the storage trajectory is fulfilled).

Penalties are in place for entities not adhering to the measure. In the event that a storage user does not store the required minimum quantity of gas within one of the specified time periods, the SSO applies the use-it-or-lose-it mechanism, described further in measure [Unused booked capacities](#).

Recovery of costs associated with implementation of the measure

There is no compensation mechanism provided for implementing the measure. The storage users can recover any incurred costs from the sales of gas to their customers.

Monitoring and transparency

The responsibility for monitoring the implementation of the measure lies both with ERÚ and the Ministry of Industry and Trade. The SSOs provide to above-mentioned entities and the TSO information on storage users' behaviour, as well as with a report to inform on the volume of stored gas and potential unused capacity after each control day.

Effects on the gas market

According to the Regulator, this measure has influenced the behaviour of storage users as they have consistently filled their storage capacities even prior to the prescribed time periods, maintaining high storage filling levels throughout the entire heating season.

ERÚ has not performed an in-depth analysis to assess the measure's effects (if any) on the gas market.

Difficulties and risks with the implementation of the measure

No difficulties or risks with the implementation of the measure were reported.

Application of the measure in 2022/23

According to ERÚ, although the measure contributed to meeting the gas storage filling trajectories and targets for 2022 and 2023, distinguishing the proportion of gas injection directly influenced by this measure from the portion resulting from independent market decisions is challenging. The intertwined nature of market dynamics, policy impacts and decision-making processes makes it difficult to isolate the effects of the measure from other influences.

¹⁵⁸ The control days correspond with the dates of filling trajectories and targets set by the Gas Storage Regulation.

Financial incentives for market participants (point (f) of Article 6b)

Implementation of the measure

As a financial measure towards market participants, incentivizing them to store gas in case summer-winter spreads are not favourable for gas injection, the Ministry of Industry and Trade issued Order No. MPO 22638/22/41200/01000 on crisis measures, that established a contracts-for-differences (CfDs) mechanism, connected with the recipients' obligation not to withdraw gas from the underground storage facilities at certain time periods. The CfDs were offered to storage users only temporarily, for the storage year 2022/23.

The SSOs participating in this measure, and at the storages of which the market participants had to maintain their stocks, were RWE and MND¹⁵⁹. The Czech TSO, NET4GAS, was also involved in the measure, as it was the party organizing auctions through which the CfDs were awarded and was responsible for the payments to market participants resulting from the CfDs. Market participants could enter into CfDs if they held storage capacity contracts with either RWE or MND.

The storage users interested in entering into the offered CfDs, should take part in auctions carried out by the NET4GAS, at timings defined by the Ministry of Industry and Trade. The bids included the volumes of gas that would be stored under the CfD, and the bidding gas price of the participant. The auction mechanism was different for the two SSOs; for RWE a multi-round auction with descending bid price applied, while for MND a multi-round auction with increasing discount was followed. The CfDs were awarded to the participants that offered the most favourable bids. As a result of the auctions, the successful bidders signed trilateral contracts, together with NET4GAS and the SSO at which gas was to be stored (RWE or MND). NET4GAS published the rules for participating in the auctions, and the terms & conditions of the contract at its website¹⁶⁰.

The strike price of the CfD was the bidder's clearing price at the auction, while the reference price was determined according to the gas price during the spring/summer period (no other information on the methodology for setting the reference price is publicly available). The storage obligations of the market participants were based on the contracted quantities, as follows:

- In the period up to October 31st, 2022, the market participant could not withdraw any of the contracted gas from the storage facility.
- In the period from November 1st, 2022, up to the last day of the storage year 2022/2023, the market participants had to ensure that the following percentages of the contracted gas volumes are in storage:

November 1 st – 30 th , 2022	December 1 st – 31 st , 2022	January 1 st – 31 st , 2023
80%	60%	34%

¹⁵⁹ CfDs were not offered at the gas storage operated by Moravia Gas Storage (UGS Damborice), because all storage capacity was booked by a single user, and the UIOLI mechanism was not in place when the CfDs were launched to allow releasing unused capacity. CfDs were also not offered at the gas storage operated by SPP Storage (UGS Dolni Bojanovice), because the storage facility is physically connected only to Slovak entry-exit zone, and does not provide security of supply to Czech Republic

¹⁶⁰ [Link](#) to NET4GAS website: Auction to secure gas storage and limit the disposition of stored gas for the storage year 2022/2023.

RWE and MND had to keep special balance accounts for the storage users with CfDs, which included the gas volumes in storage that had been contracted through the CfD.

If the storage user did not meet its obligations, then NET4GAS was entitled to charge a penalty, corresponding to the missing gas quantities to meet the filling target, and the agreed price in the CfD.

An additional financial measure applied is dedicated to ČEZ, and the capacity that it has booked (3 bcm/yr) on a long-term basis at the Dutch Eemshaven FSRU. The Czech State is providing financial support to ČEZ, as there is an option to purchase regasified LNG from the terminal, to be delivered at the Czech VTP, if the prevailing market price falls below a certain threshold. This reduces the risks undertaken by ČEZ related to gas price volatility. The details of the relevant contract are considered as commercial secret and are not publicly available.

Recovery of costs associated with implementation of the measure

NET4GAS was compensated for its payments to the contracting parties of the CfDs through the State budget.

Any purchases of gas by the State from ČEZ, of gas quantities at the Eemshaven FSRU, are covered by the State budget. The actual costs of implementing this measure in 2022 and 2023 are not publicly available.

Monitoring and transparency

Primarily, the Ministry of Industry and Trade was charged with monitoring of the implementation of the measure, while ERÚ had a supporting role in this process. Following each auction, NET4GAS relayed information about the auction results and the associated costs to both bodies. The involved SSOs (RWE and MND) were tasked with providing weekly updates to both the Ministry of Industry and Trade and ERÚ, concerning the special balance account of each storage user. This regular reporting system ensured that the regulatory bodies had ongoing control of their implementation and effectiveness of the measure.

NET4GAS published all documentation related to the implementation of the auctions (rules for participation, terms, and conditions, etc.). Each SSO published at its website the amount of capacity sold and final price, as well as the conditions of the respective auction.

Concerning the incentive provided to ČEZ, the Ministry of Industry and Trade is responsible for monitoring its potential implementation.

Effects on the gas market

According to ERÚ, the offering of CfDs had a moderate impact on the market, indicated by the swift return to typical summer-winter spreads soon after the policy's implementation (only 4.6 TWh were stored under this measure).

According to ERÚ, the option of LNG supplies at the Eemshaven FSRU by ČEZ, which were supported by the State, reducing the company's exposure to gas market volatility, was relatively impactful on the Czech gas market. The contracted 3 bcm/yr contributed to the filling of the storage facilities in the country and offered a more diverse portfolio of gas suppliers in the wholesale market. As details on the contract between the State and ČEZ are not publicly available (the contract has been made public but sensitive information has been redacted), it is not possible to assess the impact that this measure has on market competition and gas prices. It must be noted, though that no market participant has raised concerns about this mechanism.

Difficulties and risks with the implementation of the measure

According to the NRA, there were certain challenges and risks observed when defining and implementing the measure of providing financial incentives through CfDs:

- One challenge was in the case of one of the gas storage facilities, where more than 90% of the storage capacity was reserved by a single market participant. This situation made it practically impossible to conduct an auction as a market instrument to achieve the best market price for the provision of gas storage, due to a lack of bids from multiple bidders.
- Another challenge was the requirement to create incentives for the earliest possible injection of gas into storage. This requirement imposed a limitation on the setup of the auction process and subsequent settlement. Although the TSO was tasked with organizing the auctions under the Crisis Act, its role was essentially to administer the auction results and pay out the funds to traders. The form and parameters of the auctions were determined by the Ministry of Industry and Trade and the process itself took place in the information systems of the SSOs.

Application of the measure in 2022/23

The offering of contracts for differences contributed to meeting the gas storage filling trajectory for 2022. A volume of 4,584 GWh was injected and maintained in storage at the special balance accounts of storage users under this measure. Part of this volume, 415 GWh was already stored for SoS purposes, while the remaining volume came from new injections. The measure was only implemented in the storage year 2022/23.

The support provided to ČEZ had a relatively significant contribution to meeting the filling targets of 2022 and 2023, as the delivery of LNG to Czech gas market was partly stored at the Czech storage facilities, and partly sold by ČEZ to its final customers and to other market participants.

On the contrary, the measure's contribution for LNG suppliers in meeting the gas storage filling trajectory for 2022 and 2023 was quite substantial. With the securing the capacity of 3 billion cubic meters (bcm) of LNG, approximately a third of the annual gas consumption of the Czech Republic was potentially covered. The purchased volume was primarily used to fill one of the storages.

Unused booked capacities (point (g) of Article 6b)

Implementation of the measure

Article 60d of the Energy Act (No 458/2000) puts in place a use-it-or-lose-it mechanism for storage capacity.

The SSOs must monitor utilization of the booked storage capacity and notify the Ministry of Industry and Trade in case a user has unused storage capacity.

In the event that a storage user does not store the required minimum gas quantities at one of the specified time periods (see measure [Obligation imposed on dedicated entities](#)), the Ministry of Industry and Trade may order the respective SSO to release the user's unused capacity, along with a proportionate part of the withdrawal and injection capacity, until the end of the storage year. Additionally, the user shall also lose the right to use the contracted transmission capacity from / to the storage facility, proportionally to the amount of unused storage capacity.

The released capacity is offered by the SSO to the market via auctions, at a zero-reserve price. If the released capacity is not fully booked at the first auction, the Ministry may require the SSO to carry out additional auctions at negative reserve price for the storage service. The storage users that booked

the released capacity must comply with the corresponding obligations for maintaining minimum gas volumes in storage.

The storage user that lost its rights is not exempt from the obligation to pay the agreed respective tariffs for the booked but released storage capacity and the associated transmission capacity, even if the released capacity is booked by another storage user.

The use-it-or-lose-it mechanism is triggered if the following criteria apply:

- When at least 10% of the unused storage capacity is not filled within 30 days from the start of the injection period.
- For new storage contracts or contracts with less than 12 months duration, the measure is triggered when the storage capacity is not 90% full within a set timeframe.
- When the actual quantity of gas stored on a control day is less than the minimum quantity.

Recovery of costs associated with implementation of the measure

In case implementation of the measure results in revenue loss of an SSO (due to offering released capacity at zero or negative price), the deficit caused from imposing to the SSO the obligation to offer capacity at a negative price is covered from the State budget. To receive this compensation, the SSO must submit a claim to the Ministry no later than 6 months after the end of the calendar month in which the deficit occurred, otherwise the claim expires.

Monitoring and transparency

Both the Ministry of Industry and Trade and ERÚ are responsible for overseeing the implementation of the measure, based on reports from the SSOs. The SSOs must inform the Ministry, ERÚ and NET4GAS about the unused storage capacity within 5 days after the expiration of a control day. The SSO must also inform the Ministry in case the released capacity is not fully allocated after an auction.

Effects on the gas market

According to ERÚ, the implementation of UIOLI principle in the Czech Republic had significant implications for the relevant markets, most notably the storage market, due to the following:

- A crucial impact was the improved utilization of gas storage facilities. Capacity utilization increased at a particular storage facility, which had a significant amount of capacity reserved by Gazprom for a prolonged period but was not being used. The enforcement of the use-it-or-lose-it mechanism effectively ended this long-term reservation, which led to the filling of this storage facility that was almost empty during the winter of 2021/2022 and mid-2022.
- Also, the use-it-or-lose-it mechanism discouraged the booking of storage capacities without the intent of usage. By disincentivizing the practice of capacity hoarding, it fostered competition and market dynamics.
- However, the introduction of this measure disrupted the traditional understanding of capacity reservations' inviolability.
- It also poses a risk of degrading the commercial value of gas storage, as it limits the ability of storage operators to profit from long-term capacity reservations.

Difficulties and risks with the implementation of the measure

According to ERÚ, one of the primary challenges faced during the implementation of the measure was that the auction for unused capacity began during the summer of 2022 when gas prices were

exceptionally high. This led to initial hesitation from the market participants to reserve storage capacity. But with decreasing market prices, market participants gradually adapted to these new market dynamics.

Application of the measure in 2022/23

The amount of storage capacity released through this measure in 2022 was 4.2 TWh (approximately 11% of total available capacity) and was filled with new contracts and gas in storage. The contribution of this measure to filling targets is linked to the obligations set to storage users for maintaining gas in storage. Information on any revenue losses of the SSO is not publicly available.

No capacity has been released so far in 2023.

100% Discount on transmission tariff to storage

Implementation of the measure

An additional mechanism for facilitating storage filling, put in force with ERÚ Price Decision No. 3/2022 in May 2022, is the provision of 100% discounts for contracting transmission capacity at entry/exit points with virtual gas storage points. This adjustment was aimed at accelerating the injection of gas into storage facilities in the Czech Republic, thereby ensuring their filling for the coming winter period.

The discount is expected to continue as long as the Gas Storage Regulation sets filling targets for the Member States.

Recovery of costs associated with implementation of the measure

The costs associated with the implementation of the measure are estimated ex ante. In case the TSO loses revenues due to the offered discount, it recovers the deficit through the transmission tariffs, applying an under-recovery adjustment mechanism.

Monitoring and transparency

ERÚ is responsible for monitoring the measure's implementation, as part of monitoring the activities of the transmission system operator.

Application of the measure in 2022/23

The measure played a significant role in meeting the gas storage filling trajectory for 2022 and 2023. The exact calculation of the measure's contribution to the storage filling trajectory is challenging due to the complexity of determining the specific portion of gas injection directly influenced by this measure.

It is estimated that the discount resulted in cost savings for storage users of approximately 80 mil. € for 2022 and about 5.4 mil. € per year in the subsequent years of the regulatory period.

National measures in place prior to the Gas Storage Regulation

Minimum volume in gas storage (point (a) of Article 6b)

Implementation of the measure

Article 73a of Energy Act (No 458/2000) sets to gas suppliers selling gas to protected customers¹⁶¹ the obligation to maintain minimum gas volumes at the underground storage facilities, in order to meet

¹⁶¹ In Czech Republic the protected customers group includes households, small or medium sized enterprises and essential utilities and authorities (e.g., food and feedstock production, social services, etc.).

the supply standard of Regulation (EU) 2017/1938. This measure did not change in 2022, within the frame of the Gas Storage Regulation, nevertheless, it contributes to storage filling.

The volume obligation of each supplier corresponds, according to the supply standard, to the volume of gas needed to serve protected customers exceptionally high gas demand of at least 30 days. Each liable market participant calculates the volumes needed for its protected customers and presents proof to ERÚ before the heating season (by August 31st of each year) and monthly during heating season. From October 1st to March 31st the suppliers have to ensure that at least 30% of the required gas volumes are in storage facilities in the territory of the EU. The suppliers have to book storage capacity through the regular capacity allocation mechanism.

In case a supplier fails to meet the supply standard, a fine is imposed, of around 2 mil. € or 1% of their net turnover.

Recovery of costs associated with implementation of the measure

Gas suppliers are not being compensated for implementing the measure as the costs associated with the implementation of the measure constitute part of the commodity price paid by final protected customers or it is covered by the business strategy of the supplier.

Monitoring and transparency

ERÚ is responsible for monitoring implementation of the measure. In this respect, suppliers are obligated to submit reports to ERÚ before the start of the heating season (by August 31st) and for each winter month (on the 15th day of the month), containing information regarding their customers, their volume obligations, as well as information regarding the gas stocks they maintain.

ERÚ publishes reports¹⁶² with aggregate volumes, evaluating if the supply standard was met.

Effects on the gas market

According to ERÚ, the secured volumes represent a relatively limited segment of the overall gas market, as the storage obligations are applied to a volume which constitutes only about 5% of storage capacity. There have been efforts from suppliers to minimize the gas stock obligations imposed upon them due to this measure, as the costs that they incurred for purchasing gas for new protected customers with high consumption during the winter months, resulted in high prices in the last two years or even to suppliers' bankruptcies.

Difficulties and risks with the implementation of the measure

Market participants have indicated the need for a more explicit and comprehensive definition of "protected customers" to mitigate ambiguities that could lead to inconsistencies in the way that the measure is enforced, and the compliance of the market participants is ensured.

Application of the measure in 2022/23

According to ERÚ, the result of this measure for storage filling amounts to 5% of the country's storage capacity.

¹⁶² ERÚ, Monthly report on the evaluation of the safety standard of gas supply ([Link](#)).

Strategic storage (point (h) of Article 6b)

Implementation of the measure

The Administration of State Material Reserves, established with Act No.97/1993, is responsible for purchasing and managing strategic stocks in the Czech Republic, to manage crisis situations. ASMR undertakes to procure natural gas stocks, following a relevant decision by the Government. This decision takes into account national energy security, market conditions, storage capacity, and projected demand scenarios of protected customers. The gas reserves are dedicated solely for supplying protected customers. This obligation for gas stockholding was assigned by the Government to ASMR in 2022 to enhance security of supply but is not a result of the Gas Storage Regulation.

ASMR may procure gas quantities on its own, with the same conditions as any market participant, or it may assign to a trader the task to procure gas on its behalf. Access to storage capacity is different for ASMR compared to the rest of the market, following an amendment to the Energy Act (No 458/2000) in 2022. According to this amendment, if the Government approves the establishment of gas stocks by ASMR, the SSO of the storage at which the reserves will be maintained must offer to ASMR (or the gas trader acting on its behalf) any unused and uncontracted capacity (i.e., capacity for which market participants have not shown interest) at zero price.

ASMR is only allowed to sell the gas reserves upon explicit approval by the Government.

Recovery of costs associated with implementation of the measure

The costs incurred by ASMR for procuring gas volumes (storage capacity is offered by the SSOs at zero price) are covered by the State budget.

To ensure cost-effectiveness, the Government is involved in the oversight and approval of costs incurred. The costs of implementing the measure are estimated ex ante, and the actual costs incurred are then calculated based on the real expenses and expenditures during the implementation period.

Monitoring and transparency

The Ministry of Industry and Trade is responsible for monitoring the implementation of ASMR's activities.

ASMR does not publish information regarding the gas quantities it purchased, the current status of these quantities and the storage capacity that has been utilized to keep the stocks.

Effects on the gas market

According to ERÚ, this measure only had limited contribution to improving energy security, specifically for protected customers, due to the small amount of gas reserves, and the fact that this gas was not actually used.

Difficulties and risks with the implementation of the measure

Main challenges identified by ERÚ were the high gas prices when ASMR procured the stocks, and the limited scope of the measure.

Application of the measure in 2022/23

The measure had limited contribution to meeting the storage filling targets in 2022 and 2023, as it resulted in establishing a state-controlled reserve of 2.4 TWh (6% of aggregate storage capacity in Czech Republic).

The cost of implementing the measure in 2022 amounted to ca. 350 mil. € (inclusive of VAT), for gas procurement, transportation, and storage. Gas purchases by ASMR benefited from a VAT exemption, reducing the actual cost of the measure.

Key takeaways

- The underground storage facilities in Czech Republic have a working volume of 37.5 TWh, corresponding to 40% of the country's annual gas demand in 2022.
- The Czech Republic has succeeded so far in meeting the filling trajectories and targets, set in the Gas Storage Regulation, as well as the national target of 90% on November 1st. On November 1st, 2022, the filling level was 98%, and continues to remain significantly above the filling trajectories in 2023, so far.
- The Czech Republic is implementing a combination of old and new measures, which utilize the country's underground storage facilities to enhance security of supply:
 - The suppliers of protected customers are obligated to store gas in order to comply with the supply standard. The stored volumes correspond to 30% of their obligations to be maintained at storage facilities in the EU. Costs incurred by the suppliers are recovered from their gas sales. Implementation of this measure is monitored by ERÚ. This measure was in place before the Gas Storage Regulation. Its impact in 2022 is estimated at 5% of the country's storage capacity.
 - Storage users are obligated to maintain a minimum filling level, as share of their booked capacity, corresponding to the filling trajectories and targets set by the Gas Storage Regulation. In case a user does not comply with these targets, the SSO releases its booked but unused capacity through a use-it-or-lose-it mechanism. Costs incurred by the storage users are recovered from their gas sales. The impact of this measure to the filling targets cannot be distinguished from the storage filling due to users' market decisions.
 - Contracts for differences were offered to storage users in the storage year 2022/23, to mitigate the impact of negative summer-winter spreads. The contract was linked with the obligation of the storage user to maintain certain levels of gas in storage between October 2022 and January 2023. CfDs were offered through auctions carried out by the TSO (NET4GAS) and the involved SSOs (RWE and MND). NET4GAS was responsible for payments to the storage users having signed CfDs. The TSO then recovered its costs from the State budget. As a result of the CfDs, around 4.6 TWh were injected in the storage facilities. The Ministry was primarily responsible for monitoring this measure, with ERÚ having a supporting role.
 - The State has agreed with ČEZ to purchase gas from the Eemshaven LNG terminal (at which ČEZ has booked capacity of 3 bcm/yr), when market prices fall below a certain level. Details on implementation of this measure are not publicly disclosed. The Ministry is responsible for monitoring this measure.
 - In case storage users have unused capacity, and are not fulfilling their filling obligations, the SSO proceeds, following a relevant order from the Ministry of Industry and Trade, with release of the unused capacity, and its offering at auctions, initially at a zero and then at negative reserve prices. Any revenue losses of the SSO due to the

offered discounts are recovered from the State budget. Implementation of this measure resulted in the release and booking from other parties of 4.2 TWh of capacity, including capacity released from Gazprom. The Ministry is primarily responsible for monitoring this measure.

- The Administration of State Material Reserves (ASMR) undertakes to establish and maintain gas reserves, upon decision of the Government. The obligation was introduced in 2022, but before the Gas Storage Regulation entered into force. The stocks are used only following governmental approval. Since 2022, the SSOs must offer unused capacity to ASMR at zero price. In 2022 ASMR established and stored 2.4 TWh of reserves. The Ministry is responsible for monitoring implementation of this measure.
- As an additional measure (not within the Gas Storage Regulation list), NET4GAS is providing a 100% discount for contracting transmission capacity at entry/exit points with virtual gas storage points.

Denmark

Overview

Gas storage infrastructure (August 1 st , 2023)	
Aggregate GWV	9.84 TWh
Injection capacity	90.72 GWh/d
Withdrawal capacity	180 GWh/d

Storage filling targets of Gas Storage Regulation and actual gas in storage					
2022			2023		
	Target	Actual		Target	Actual
1 August	61%	88%	1 February	45%	85%
1 September	68%	94%	1 May	40%	74%
1 October	74%	98%	1 July	60%	75%
1 November	80%	99%	1 September	80%	89%
			1 November	90%	N/A

Measures applied in the MS for gas storage			
a) Minimum volume in gas storage		f) Financial incentives for market participants	
b) Tender of capacities		g) Unused booked capacities	
c1) Balancing stock managed by TSO		h) Strategic storage	
c2) Obligations imposed on designated entities	✓*	i) Appointment of dedicated entity	
d) Coordinated instruments		j) Discounts on storage tariffs	
e) Voluntary joint procurement mechanisms		k) Capital and operational expenditures	
Other	100% discount on transmission tariffs to/from storage*		

* Measure in place prior to the Gas Storage Regulation and not amended in 2022

Applicable legal and regulatory framework

Natural Gas Supply Act (No. 1331 of 2013, latest version No 1100 of 16. August 2023) assigns to Energinet (in its capacity as TSO) certain tasks related to ensuring Denmark's security of supply (Article 12(3)). In this framework, Energinet undertakes to hold emergency gas in storage and procure filling requirements, as described in the Emergency Plan prepared by the Danish Energy Agency (the competent authority for security of supply in Denmark), with the assistance from Energinet. The latest version of the Emergency Plan was that of October 31st, 2022¹⁶³).

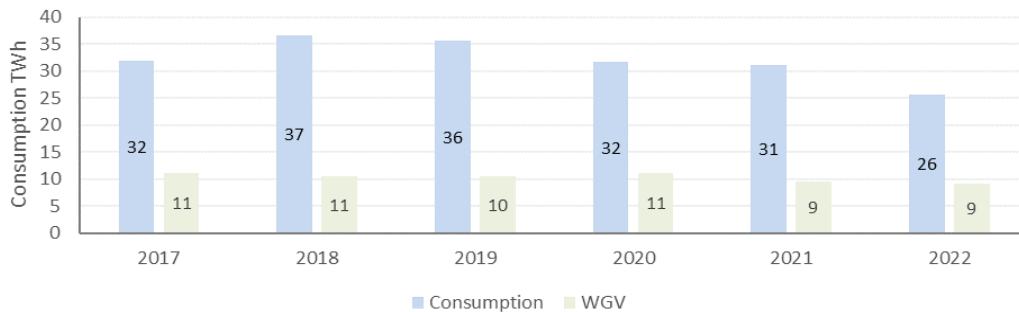
¹⁶³ [Link](#) to the Emergency Plan, May 2023.

The Danish Utility Regulator (DUR) approves the emergency supply tariff methodology. This tariff is used to cover Energinet’s expenses from applying security of supply measures. In May 2022 DUR issued Decision 22/00038¹⁶⁴ that partially approves the tariff methodology in the Danish gas transmission system including the emergency tariff, which was then amended in September 2022 by Decision 22/01964¹⁶⁵ concerning the approval of the ex-post method for the emergency supply tariff for non-protected gas customers.

Gas storage infrastructure

The underground gas storage infrastructure in Denmark has a total gas working volume of 9.84 TWh, withdrawal capacity of 180 GWh/d and injection capacity of 90.72 GWh/d¹⁶⁶. Denmark’s storage capacity corresponds to around 29% to 36% of the country’s annual gas consumption since 2017. Figure 40 shows how the storage capacity compares to the annual consumption for the period 2017 to 2022.

Figure 40: Storage capacity and annual gas consumption from 2017 to 2022¹⁶⁷



Denmark has 2 underground storage facilities, both grouped into a Virtual Gas Storage. The locations of the country’s storage facilities are presented in the map below.

Figure 41: Underground gas storage facilities in Denmark¹⁶⁸



¹⁶⁴ [Link](#) to Decision 22/00038.

¹⁶⁵ [Link](#) to Decision 22/01964.

¹⁶⁶ Source: GIE (August 1st, 2023).

¹⁶⁷ Sources: GIE, Eurostat. It is noted that the consumption data include consumption on production platforms, hence consumption of gas by final consumers is lower than the one indicated in the graph.

¹⁶⁸ Source: GIE Storage Map.

The Virtual Gas Storage is operated by GSD. The aggregate technical characteristics of the Danish storage facilities are presented in Table 73.

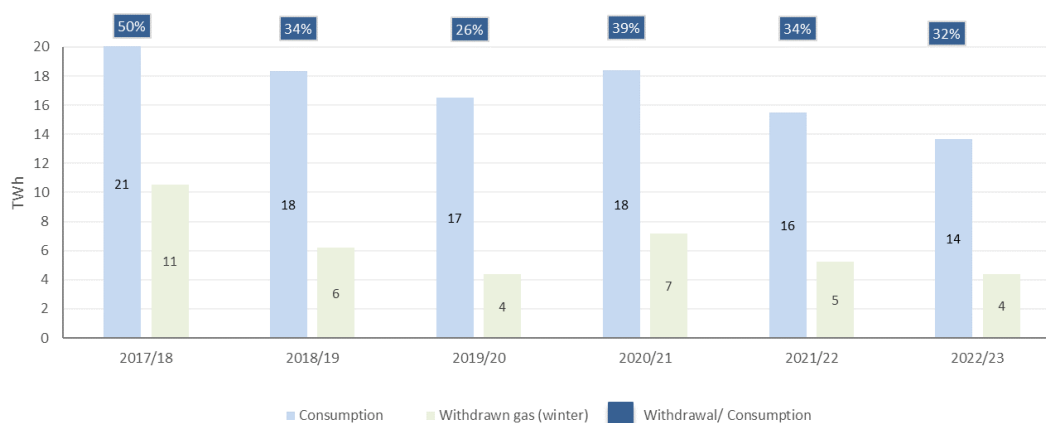
Table 73: Gas storage operators and infrastructure

Name	GWV (TWh)	Injection (GWh/d)	Withdrawal (GWh/d)
GSD (Virtual Gas Storage)	9.84	90.72	180

Gas storage operation and filling targets

Withdrawals of gas from the Danish underground storage facilities during the winter period (November of one year to March of the next) have ranged considerably. In 2017/18 gas withdrawals in winter corresponded to 50% of gas consumption during that period, while in 2022/23 this share dropped to 32% (Figure 42).

Figure 42: Use of gas storage to cover demand in the winter season¹⁶⁹



The filling targets and trajectories for Denmark in 2022 and 2023, as established in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301, are presented in the Table below. No national targets have been set, different from those in the Gas Storage Regulation.

Table 74: Targets and trajectories for Denmark in 2022 and 2023¹⁷⁰

2022	1 August	1 September	1 October	1 November	
	61%	68%	74%	80%	
2023	1 February	1 May	1 July	1 September	1 November
	45%	40%	60%	80%	90%

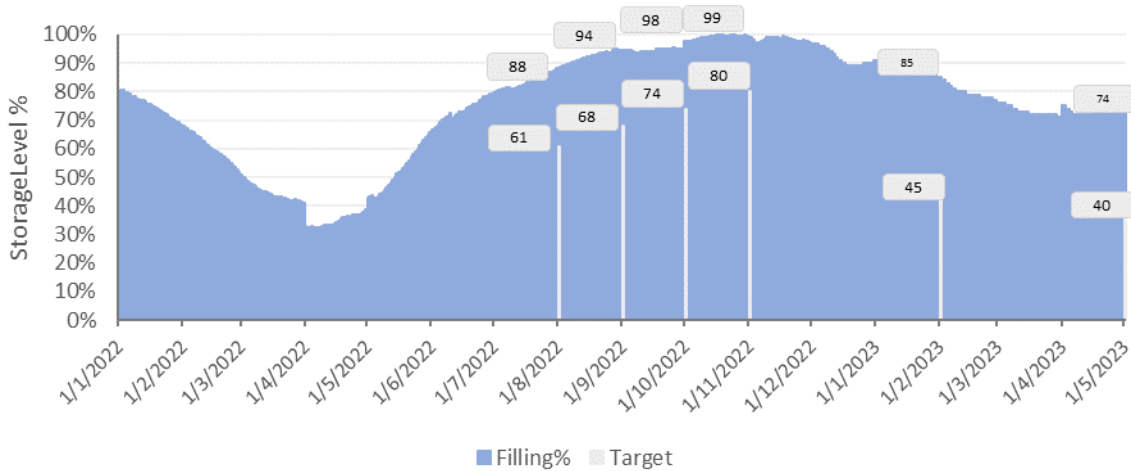
Denmark has succeeded in meeting the EC Gas Regulation storage filling trajectories and targets for 2022 and 2023 so far (Figure 43). On November 1st, 2022, the Danish storages were almost full (99%).

¹⁶⁹ Sources: GSD (for withdrawal) and Eurostat (for consumption). It is noted that the consumption data include consumption on production platforms, hence consumption of gas by final consumers is lower than the one indicated in the graph.

¹⁷⁰ Filling trajectories and targets as stated in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301.

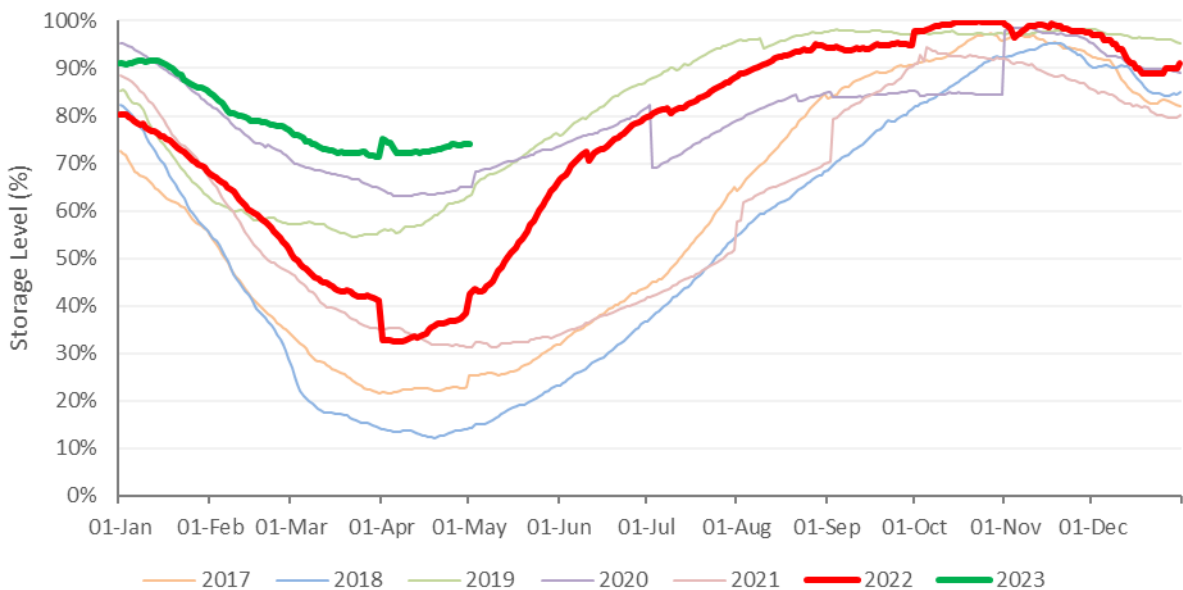
Gas in storage has been kept in high levels throughout 2023, remaining at 74% in the beginning of May.

Figure 43: Daily gas in storage vs filling targets in 2022 and 2023¹⁷¹



The storage filling level during the winter of 2022 followed the same trend with that of the past 5 years, exception the case of 2021, during which the gas in storage was at somewhat lower levels. In 2023 the filling levels are a bit higher than the ones observed in 2020 (Figure 44).

Figure 44: Comparison of daily gas filling trends between 2017 and 2023¹⁷²



Overview of national measures

Denmark already had instruments in place involving security of supply using its storage facilities, prior to the Gas Storage Regulation, by assigning relevant tasks to Energinet to comply with the supply standard of Regulation (EU) 2017/1938.

Energinet has been tasked with purchasing filling requirements from market participants via open tenders, to fill the storages up to a certain (ex-ante) determined level. Energinet reserves the right to

¹⁷¹ Source: GSD.

¹⁷² Source: GSD.

buy gas stored under the filling requirements (i.e., filling requirements are also used as strategic storage), to cover any supply deficits in case of an emergency. The filling requirements will also help to ensure that the storage customers keep certain volumes of gas in storage at certain points of time during winter.

Also, Energinet is tasked with buying storage capacity directly from the SSO to supplement filling requirements, as a means of ensuring emergency supply for protected customers in case of an emergency situation. Energinet purchases the emergency gas.

The filling requirements and the emergency gas are substitutable and fulfil the same function.

The mechanisms outlined above corresponds to point (c2) from the list of Article 6b(1) of the Gas Storage Regulation:

Measure	Implementation	Relevance to Article 6b(1) measures
To ensure supply for protected customers in case of emergency, Energinet is responsible for procuring filling requirements through open tenders, and for procuring emergency storage (space and withdrawal capacity) directly from the SSO, which is filled with emergency gas	Prior to 2022	Imposing an obligation on other designated entities for the purpose of safeguarding the security of gas supply in the case of an emergency (point c2).

This measure is analysed in detail below.

As an additional incentive to facilitate storing of gas, another measure in place is the provision of a 100% discount on the price for reserved transmission capacity for gas storage entry and exit.

National measures implemented due to the Gas Storage Regulation

The measures applied in Denmark, aiming to use the country's storage facility for security of supply purposes, were already in place before 2022 and the entry into force of the Gas Storage Regulation.

National measures in place prior to the Gas Storage Regulation

Obligations imposed on designated entities (point c2 of Article 6b)

Implementation of the measure

The TSO, Energinet, is responsible for ensuring the availability of emergency supply in an emergency situation. Procurement of emergency supply takes place in the form of either purchase of storage capacity by the TSO directly from the SSO (filled with corresponding purchased emergency gas) or as filling requirements purchased by the TSO from market participants. The level of emergency supply is determined by the Danish Energy Agency, but Energinet may choose to substitute between emergency gas and filling requirements.

Emergency storage:

Energinet reserves storage capacity (storage space) for emergency storage in the autumn and buys the necessary withdrawal capacity at the end of the year from the gas storage company (Gas Storage Denmark). According to the Danish Gas Act, a gas storage company shall make its capacity available for security of supply measures as a PSO task, and the gas storage company can only sell storage capacity to the commercial market after the need for storage capacity to ensure security of gas supply is met. Energinet fills the procured storage capacity with emergency gas, that it purchases from the market.

The amount of emergency storage/gas to be purchased by Energinet as emergency storage is determined by the Danish Energy Agency in coordination with Energinet.

Filling requirements:

Energinet may purchase filling requirements from storage users, through open tenders. These filling requirements are contractual agreements between Energinet and storage users, assigning to the user to provide the following services:

- Ensuring that specific percentages of the contractually agreed gas quantities are stored at a defined storage facility at specific dates of the winter period, and
- Making part or whole of these stored quantities available for Energinet to purchase in case of emergency.

Energinet launches tenders by publishing, at its website invitations to tender requesting from storage users to offer a minimum and maximum amount of gas that could be stored. The quantities assigned to each user, between its offered minimum and maximum, depend on the needs for storage filling at the time the tender is launched.

According to the terms and conditions of the “agreement regarding Individual filling requirements”¹⁷³, the delivery period for the 2022/23 storage cycle runs for 1 year, from May 1st, 2022, to April 5th, 2023). This period is divided into 3 subperiods:

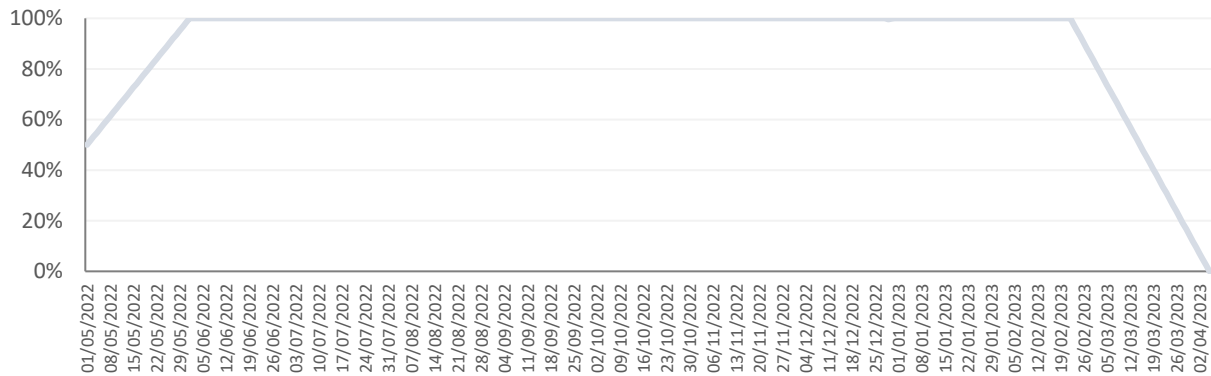
- Incremental period (May 1st to May 31st)
- Plateau period (June 6th to February 22nd)
- Reduction period (February 23rd to April 5th)

For the 2023/24 storage cycle, the period will be smaller, from December 2023 to February 2024, with the incremental period from December 15th to December 31st, 2023, the plateau period from January 1st to February 15th, 2024, and the reduction period from February 16th to February 29th, 2024.

The minimum filling requirement assigned to a storage user begins at an initial base (50% of the agreed quantities for 2022/23), increasing gradually during the incremental period, up to a certain maximum that is maintained throughout the plateau period (100% of the agreed quantities in 2022/23), and then gradually reduced to zero during the reduction period.

¹⁷³ [Link](#) to the Agreement regarding Individual Filling Requirements for 2022/2023.

Figure 45: Minimum filling requirements of storage users for storage cycle 2022/23



The provider of the filling requirements charges to Energinet a fixed payment, each month at a certain percentage stipulated in the agreement. In case Energinet makes use of the call-on option for the gas stocks during an emergency, a variable payment is paid to the storage user, depending on the quantity used by Energinet and natural gas price of the day prior to the day that the gas was withdrawn, on the basis of the EEX ETF neutral gas price.

In case that the provider of the filling requirements is not compliant with the terms of the agreement, including the failure to establish the required filling levels within the agreed deadlines, Energinet is entitled to procure the missing volumes, at the expense of the provider (the provider covers the difference between the actual gas price, and the price in case the provider was not compliant with the agreement). Additionally, the fixed payment to the provider is adjusted proportionately to the provider’s actual filling level.

Recovery of costs associated with implementation of the measure

According to the Danish Emergency Plan, Energinet recovers its costs for implementing its tasks ensuring security of supply. To this end, Energinet applies an emergency tariff to cover the security of supply costs. The cost recovery is undertaken in accordance with relevant legal provisions on cost recovery for TSOs in national legislation and EU legislation, including NRA methodology approval.

The protected customers are charged with a higher tariff than the non-protected customers. According to methodology for determining the emergency tariff in 2022, approved by DUR (Decisions 22/00038 and 22/01964), protected customers cover 85% of the total cost while non-protected cover the remaining 15%. The emergency tariff is calculated according to the formulas below:

$$Tariff_{protected} = \frac{85\% \times emergency\ supply\ cost\ base}{share\ of\ protected\ consumption \times expected\ Danish\ consumption}$$

and

$$Tariff_{non-protected} = \frac{15\% \times emergency\ supply\ cost\ base}{share\ of\ non - protected\ consumption \times expected\ Danish\ consumption}$$

Monitoring and transparency

Energinet monitors compliance of the filling requirements of each storage user. The users are obligated to document and report the actual filling level during the period of delivery, on a monthly basis (including the contracted firm storage capacity and filling level of each day). In case of an emergency, Energinet is entitled to claim documentation every gas day.

Energinet reports on its security of supply activities to the Danish Energy Agency, by submitting an annual report on security of gas supply¹⁷⁴.

Tendering of filling requirements is carried out by Energinet in a transparent manner. The entity publishes at its website all information and documentation related to the tenders, information related to gas volumes to be purchased, and the applicable daily percentage of gas to be sustained in the storage facilities.

The way that Energinet estimates the filling requirements requested with each tender is not published.

Effects on the gas market

The provision of filling requirements may increase demand for storage capacity and withdrawal gas from the wholesale market. This however does not apply in the case that market participants offer gas quantities for filling requirements that are already in storage, or they already intended to store.

Difficulties and risks with the implementation of the measure

In the past, there were tenders for filling requirements at which no products were sold, because market participants demanded a price too high for Energinet to accept. In 2022 though substantial gas quantities were secured, compared to the previous years.

Application of the measure in 2022/23

To procure filling requirements from market participants, Energinet conducted four tenders in 2022:

- In the first tender (launched on April 7th, 2022), the requested filling requirements corresponded to a total gas volume of 1,810 GWh, for the period May 1st, 2022 – April 5th, 2023. As a result of this tender, 598.82 GWh were awarded (33% of the requested volumes). The total costs for the awarded quantities amount to 11.3 mil. €¹⁷⁵, corresponding to a unit cost of 19 €/MWh.
- In the second tender (launched on May 3rd, 2022), the requested filling requirements corresponded to a total gas volume of 1,220 GWh, for the period May 1st, 2022 – April 5th, 2023. As a result of this tender, 233.5 GWh were awarded (19% of the requested volumes). The total costs for the awarded quantities amount to 5.7 mil. €, corresponding to a unit cost of 25 €/MWh.
- In the third tender (launched on June 8th, 2022), the requested filling requirements corresponded to a total gas volume of 1,100 GWh for the period October 16th, 2022 – April 5th, 2023. As a result of this tender, 670 GWh were awarded (61% of the requested volumes). The total costs for the awarded quantities amount to 16 mil. €, corresponding to a unit cost of 25 €/MWh.
- In the fourth tender (launched on September 27th, 2022), the requested filling requirements corresponded to a total gas volume of 300 GWh for the period October 16th, 2022 – April 5th, 2023. No individual filling requirements were purchased in this tender.

The total gas quantities secured by Energinet in the 2022 tenders amounted to 1.5 TWh, at a cost of 33.8 mil. €, corresponding to a unit cost of 22.5 €/MWh.

Energinet did not have to procure any gas quantities from the filling requirements so far.

¹⁷⁴ [Link](#) to the Report on Security of Gas Supply, 2022.

¹⁷⁵ Exchange rate: 0.134 EUR/DKK (Source: ECB – 14/7/2023).

The emergency tariff method approved by DUR and applied by Energinet for the gas year 2021/22¹⁷⁶, to compensate for Energinet's procurement of filling requirements and the purchase of emergency storage from the storage operator, resulted to a tariff of ca. 0.55 €/MWh for protected customers and 0.27 €/MWh for non-protected customers. For gas year 2022/23¹⁷⁷ the emergency tariff was increased almost 5 times, 2.69 €/MWh for protected and 1.40 €/MWh for non-protected customers, as a result of the filling requirements and emergency storage procured by Energinet.

Furthermore, the level of emergency storage procured by Energinet for the season 2022/2023 (which was filled with emergency gas) was approx. 1.7 TWh.

Consequently, the implementation of this measure has resulted in a total storage filling that reached approx. 3.2 TWh, which corresponds to 35% of Denmark's storage capacity.

Key takeaways

- The underground storage facilities in Denmark have a working volume of 9.8 TWh, corresponding to around 35% of the country's annual gas demand. The projected gas consumption for Denmark for 2023 is around 17 TWh which would mean that the Danish storage capacity will be above 50 percent of the country's gas consumption.
- Denmark has succeeded so far in meeting the filling trajectories and targets, set in the Gas Storage Regulation (no national targets other than those in the Regulation have been set). On November 1st, 2022, the filling level was 99%, and has remained at high levels throughout 2023 (75% in July).
- Prior to the Gas Storage Regulation, Denmark already had emergency supply measures in place involving storing gas at the underground storage facilities, to comply with the supply standard of Regulation (EU) 2017/1938.
- Within the frame of these emergency supply measures, the national TSO, Energinet, procures:
 - Emergency storage capacity directly from the SSO. Emergency gas to be filled into the strategic storage is purchased in the market by Energinet.
 - Filling requirements from storage users, through open tenders. The users providing the service must maintain the required filling levels, including 100% of the agreed quantity during the winter period.
- Energinet has the right to procure from the storage users, part or whole of the gas stocks under the filling requirements, in case of emergency.
- Energinet's costs for procuring filling requirements (and gas in case of emergency) are recovered through an emergency tariff applied to final consumers. The tariff methodology is approved by DUR. A different tariff applies for protected and non-protected consumers (the protected consumers undertake 85% of the costs).
- The Danish Energy Agency monitors the implementation of the measure.

¹⁷⁶ Source: Energinet, Prices for transport in the gas transmission system – Effective as of 1 October 2022 ([Link](#)).

¹⁷⁷ Source: Energinet, Prices for transport in the gas transmission system – Effective as of 1 October 2023 ([Link](#)).

- Energinet publishes information related to the tendering of filling requirements. However, the rationale according to which the filling requirements requested with each tender are determined is not published.
- In 2022, four tenders for filling requirements were carried out, resulting in securing 1.5 TWh, at a cost of 33.8 mil. €, corresponding to a unit cost of 22.5 €/MWh. No gas quantities were purchased by Energinet in 2022 from the filling requirements. The emergency gas procured and stored directly by Energinet in 2022 amounted to around 1.7 TWh.
- The emergency tariff, through which Energinet is compensated for procuring filling requirements was increased 4.5 times between gas year 2021/22 and 2022/23.

France

Overview

Gas storage infrastructure (August 1 st , 2023)	
Aggregate GWV	136.3 TWh
Injection capacity	1,227.7 GWh/d
Withdrawal capacity	2,509.7 GWh/d

Storage filling targets of Gas Storage Regulation and actual gas in storage					
2022			2023		
	Target	Actual		Target	Actual
1 August	52%	80%	1 February	41%	64%
1 September	65%	91%	1 May	7%	38%
1 October	72%	97%	1 July	35%	61%
1 November	80%	100%	1 September	81%	89%
			1 November	90%	N/A

Measures applied in the MS for gas storage			
a) Minimum volume in gas storage		f) Financial incentives for market participants	
b) Tender of capacities	✓	g) Unused booked capacities	
c1) Balancing stock managed by TSO		h) Strategic storage	
c2) Obligations imposed on designated entities		i) Appointment of dedicated entity	✓
d) Coordinated instruments		j) Discounts on storage tariffs	
e) Voluntary joint procurement mechanisms		k) Capital and operational expenditures ¹⁷⁸	✓*
Other	"Safety net" (further described below)		

* Measure in place prior to the Gas Storage Regulation and not amended in 2022

Applicable legal and regulatory framework

Since 2018, French storage operators have been regulated. Regulation was introduced by Law No 2017-1839 of December 30th, 2017:

¹⁷⁸ The SSOs recover their costs from the gas consumers (authorized revenue for storage or the gas filling measure provided by the "MUPPA" law). However, this is already covered as part of the other measures analysed for France and not examined as a separate measure.

- The storage capacities that guarantee the security of supply are listed in the multiannual energy programming (PPE) mentioned in Article L. 141-1. These infrastructures are maintained in operation by SSOs.
- In return, and within the limits of the obligation to maintain the operation of the storage sites specified by the PPE, the storage operators are guaranteed to have their costs covered, as long as these costs are those of an efficient operator. French NRA, CRE, sets an annual authorized revenue for each SSO¹⁷⁹.
- The framework provides for an allocation of storage capacities via auctions¹⁸⁰, which was implemented by Energy Regulation Commission (CRE) Decision No 2018-039¹⁸¹ published on February 28th, 2018, deciding on the terms and conditions for marketing storage capacities as part of the implementation of regulated third-party access to underground natural gas storage in France. The currently applied allocation rules were decided on by CRE in its deliberation of 7 October 2022. The French law provides minimum filling levels on November the 1st to holders of storage capacity, which level has been set by decree (85% since 2018).
- Any difference between the auction revenues and the authorized revenue for a given year would be compensated for by a positive (sub-revenue) or negative (over-revenue) tariff term in the TSOs' tariffs collected with domestic gas consumers (and returned to or collected from SSOs).

In 2022, amendments were made to the French legal and regulatory frameworks, to enhance the role of underground storage facilities in security of supply and facilitate meeting the filling trajectories and targets set by the Gas Storage Regulation. In particular:

- CRE Decision No 2022-251¹⁸² published on October 7th, 2022, amending certain terms and conditions for marketing natural gas storage capacities.
- The “MUPPA” (Emergency Measures for the Protection of Purchasing Power) (Law No. 2022-1158, and French Energy Code Article L. 421-7-2)¹⁸³ adopted on August 16th, 2022, which introduced an additional mechanism to ensure that storage filling trajectories are met.

Gas storage infrastructure

The underground gas storage infrastructure in France has a total gas working volume of 136.3 TWh, withdrawal capacity of 2,509.7 GWh/d and injection capacity of 1,227.7 GWh/d¹⁸⁴. Storage capacity in France corresponds to approx. 30% of the country's annual gas consumption. Figure 46 shows how the storage capacity compares to the annual consumption for the period 2017 to 2022.

¹⁷⁹ [Link](#) to CRE's Deliberation of 23 January 2020 on tariffs for UGSs.

¹⁸⁰ [Link](#) to the Auctions' Framework.

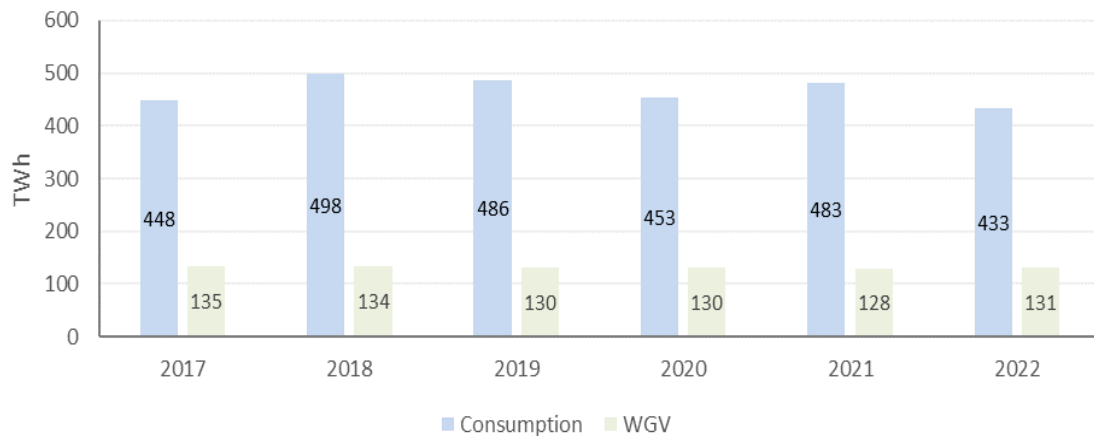
¹⁸¹ [Link](#) to CRE's Decision No 2018-039.

¹⁸² [Link](#) to CRE's Decision No 2022-251.

¹⁸³ [Link](#) to the MUPPA.

¹⁸⁴ Source: GIE (August 1st, 2023).

Figure 46: Storage capacity and annual gas consumption from 2017 to 2022¹⁸⁵



France has a total of 16 underground gas storage facilities, the largest being Chémery which is part of the Virtual Gas Storage Serene Atlantique, that has an aggregate storage capacity of 45.2 TWh (34% of the total capacity). The location of the country’s UGSs are presented in the map below.

Figure 47: Underground gas storage facilities in France¹⁸⁶



Storage facilities in France are operated by Storengy and Teréga (in the South-West region). The technical characteristics of the storage facilities of each SSO are presented in Table 75.

¹⁸⁵ Sources: GIE, Eurostat.

¹⁸⁶ Source: GIE Storage Map.

Table 75: Gas storage operators and infrastructure⁷⁹¹⁸⁷

Name	GWV (TWh)	Injection (GWh/d)	Withdrawal (GWh/d)
Storengy	103.33	928.46	1,955.16
VGS SALINE (Tersanne, Etrez, Manosque)	11.52	92.16	640
VGS SEDIANE (Saint-Illiers, Beynes Supérieur, Beynes Profond)	14.01	164.87	280.27
VGS SEDIANE B (Gournay-sur-Aronde)	10.97	74.81	182.53
VGS SERENE ATLANTIQUE (Chémery, Céré-la-Ronde)	48.87	421.69	665.26
VGS SERENE NORD (Cerville, Germiny-sous-Coulombs)	17.96	174.93	187.1
Teréga (VGS Lussagnet)	33.01	299.22	554.56

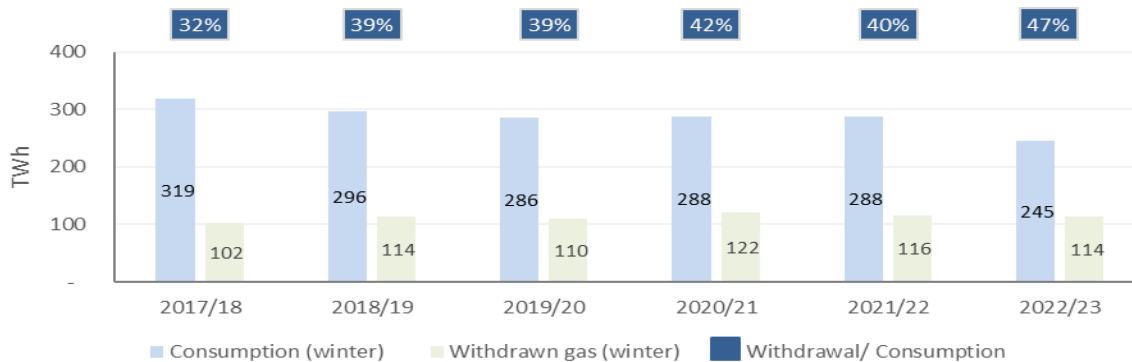
In addition to the underground gas storage facilities, France can also store gas at its LNG facilities, with aggregate storage capacity of 1,340,000 m³ LNG, as shown in the Table below.

 Table 76: Storage capacity of LNG Facilities¹⁸⁸

Name	Storage Capacity (m ³ LNG)
Fos Tonkin LNG Terminal	80,000
Montoir de Bretagne LNG Terminal	360,000
Dunkerque LNG Terminal	570,000
Fos Cavaou LNG Terminal	330,000

Gas storage operation and filling targets

Gas withdrawn from the French storage facilities during the winter period (November Year-N to March Y-N+1), between 2018/19 and 2021/22, corresponded to around 40% of the gas demand of the same period. This share increased in 2022/23 to 47% (Figure 48).

 Figure 48: Use of gas storage to cover demand in the winter season¹⁸⁹


¹⁸⁷ Available data concern total virtual gas storages. UGS included in each VGS are in parenthesis.

¹⁸⁸ Source: GIE.

¹⁸⁹ Source: GIE (for withdrawal) and Eurostat (for consumption).

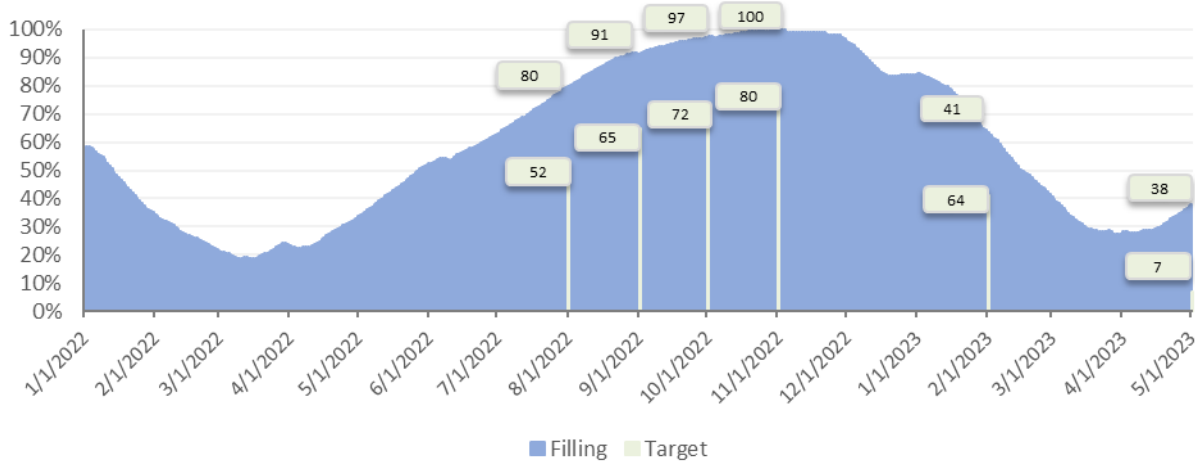
The filling targets and trajectories for France in 2022 and 2023, as established in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301, are presented in the Table below. In 2022, France already had in place a national target level of 85% by November 1st. Also, the Government has the possibility to obligate gas suppliers to book additional storage capacities (85% of which should be used to store gas) in case that the volume of booked capacities is too low (“safety net”) to ensure the security of gas supply.

Table 77: Targets and trajectories for France in 2022 and 2023¹⁹⁰

2022	1 August		1 September		1 October		1 November		
	EC	NT ¹⁹¹	EC	NT	EC	NT	EC	NT	
	52%		65%		72%		80%	85%	
2023	1 February		1 May		1 July		1 September		1 November
	41%		7%		35%		81%		90%

France has succeeded in meeting and even exceeding the EC Gas Regulation storage filling trajectories and targets for 2022 and 2023 (so far), as shown in Figure 49. On November 1st, 2022, the storage filling level reached 100%.

Figure 49: Daily gas in storage (%) vs filling targets (%) in 2022 and 2023¹⁹²

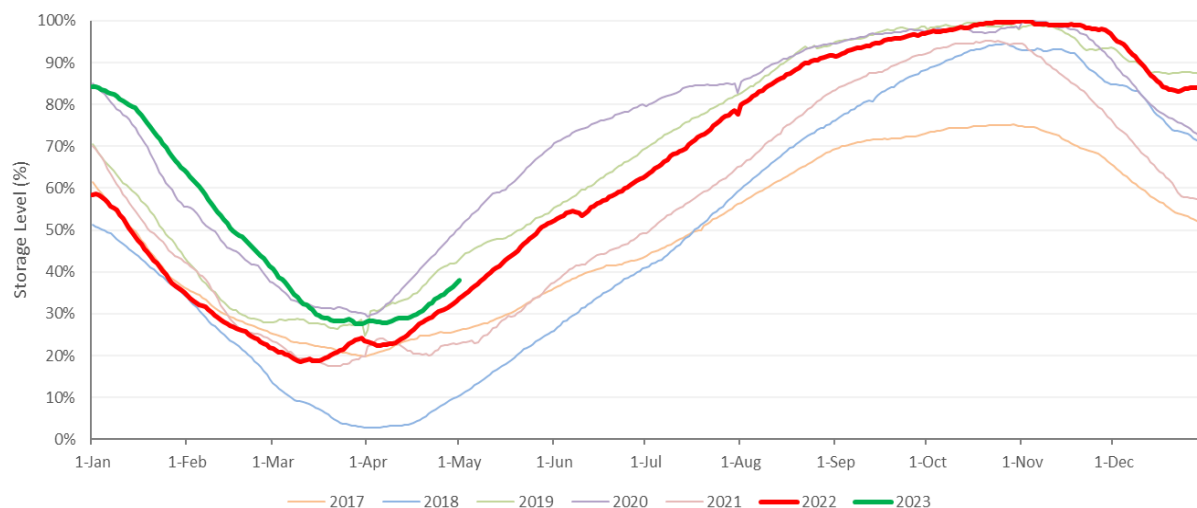


The storage filling in the winter of 2022/23 followed the same trend with the fillings in 2019 and 2020, and higher than the level in 2021 (Figure 50).

¹⁹⁰ Filling trajectories and targets as stated in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301.

¹⁹¹ EC: European Regulation 2022/2301, European Regulation 2022/1032, and NT: National Target.

¹⁹² Source: GIE, Teréga, (EC) 2022/1032.

Figure 50: Comparison of daily gas filling trends between 2017 and 2023¹⁹³

Overview of national measures

Regarding measures that have already been in place prior to the entry into force of the Gas Storage Regulation:

- Article L421-5-1 provides for the allocation of storage capacities via public auctions, since 2018. Several amendments to the terms and conditions of the auctions were made since then, in particular in 2022 to better reflect the latest developments in the market conditions.
- Article L421-7 of the Energy Code provides that storage capacity holders have the legal obligation to meet a minimum filling level by November 1st of each year (set by Decree at 85% of their booked capacities, since 2018). This obligation has remained unchanged in 2022 and contributed to the storage filling target.
- Article L421-6 of the Energy Code provides the Government has the possibility to obligate gas suppliers to book additional storage capacities (85% of which should be used to store gas) in case the volume of booked capacities is too low to ensure the security of gas supply (“safety net” measure).

In addition to this legal and regulatory framework, a new measure for storages was introduced by the “MUPPA” law of 16 August 2022 and transposed into the Energy Code (Article L421-7-2), according to which the Minister responsible for energy sets a filling trajectory for each SSO. If the capacities booked by the suppliers or if the level of utilization of the booked capacities suggests that the filling will be lower than the objective, then the Minister can order the SSOs to make up for necessary security stocks. The implementation Decree¹⁹⁴ was published on 10 August 2023 but the associated ministerial ruling (which will set the trajectories) is still under preparation when this report is published.

The mechanism outlined above combines two of the measures from the list of Article 6b(1) of the Gas Storage Regulation:

¹⁹³ Source: GIE, Teréga.

¹⁹⁴ [Link](#) to the implementation Decree No. 2023-766 of August 10, 2023.

Measure	Implementation	Relevance to Article 6b(1) measures
Since 2018, holders of storage capacity have been assigned with a storage filling obligation, having to store 85% of their booked capacity by November 1 st of each year. Capacity is offered at zero reserve price at the auctions as an incentive. In 2022 the frequency of auctions increased to facilitate booking.	Introduced in 2018, amended in 2022	Requiring storage system operators to tender their capacities to market participants (point b).
SSOs are responsible for making up for potential gaps between the filling targets and actual filling levels, upon government request.	Introduced in 2022	Appointing a dedicated entity tasked with meeting the filling target in the event that the filling target would not otherwise be met (point i).

These measures are analysed in detail below.

The “safety net” provision can be considered as an additional measure, further to the measures related to the Gas Storage Regulation. The safety net is triggered if the government finds out that the anticipated storage levels (even if shippers have respected their individual filling obligation of 85%) will not be sufficient to ensure security of supply. In this case, the government would force market participants and/or SSOs to book additional storage capacities, and to fill it at least up to a minimum of 85%.

The revenues required for the capital and operational expenditures of the underground storage facilities in France are socialized through transmission tariffs, only to the final customers in the country (no costs are allocated to cross-border points). This cost recovery mechanism has been in place since 2018, and, although it corresponds to point k of Article 6b(1) of the Gas Storage Regulation, it is not related to measures for enhancing security of supply, and thus is not analysed further in this Study.

National measures implemented due to the Gas Storage Regulation

Tender of capacities (point (b) of Article 6b)

Implementation of the measure

The current mechanism for storage capacity auctions has already been in place since 2018, with the main principles and rules introduced by Law No 2017-1839 of December 30th, 2017¹⁹⁵. They have been amended and complemented since then and the rules currently applicable are laid down in a CRE's Decision No 2022-251 published on October 7th, 2022. This Decision sets the terms and conditions for marketing of storage capacities and changed the following points, in order to maximize storage capacity booking opportunities:

- The schedule at which capacity is offered, the capacity limits marketed by expiry date and the communication deadlines were modified in order to maximize the opportunities for contracting of capacities during the initial allocation.

¹⁹⁵ [Link](#) to Law No 2017-1839.

- Unsold capacities could be marketed over more auction slots, in the form of iterative auctions or by extending the contractual duration of the products.
- The lead times for marketing short-term products (capacities that turn out to be technically available after the marketing phase) were reduced.

Capacity is allocated via single-round auctions, for which all participants provide their full bid curves (a price level per capacity volume). Capacity is allocated on a “pay as clear” basis (same clearing price for all successful bidders, at the highest price equalling offer and demand). The list of capacity products is detailed at each SSO's website^{196,197}.

The market participants that have booked storage capacity are required to utilize it up to a minimum level as of November 1st of each year (set at 85% by Decree since 2018). If they fail to do so, they are liable to fines and still need to inject gas to meet the obligation.

Participation of storage users to the auctions is incentivised by setting the reserve price at zero. The reserve price is zero for auctions corresponding to storage capacities for the storage year N+1. The marketing procedures also provide for the sale of capacities for the years N+2 to N+4, with a non-zero reserve price, based on the winter/summer spread observed for the storage year in question and a normative value of the storage costs for this same year.

Recovery of costs associated with implementation of the measure

The difference (positive or negative) between the revenues derived from auctions and the regulated revenue is collected/returned through the TSO tariffs, paid by consumers connected to domestic gas networks and not at cross-border points. This compensation is collected from network users on GRTgaz' and Teréga's transmission systems by applying a storage tariff term to them, depending on the winter modulation of their customers connected to the gas transmission and public distribution systems (the higher the winter modulation, the greater the customer's contribution to the storage requirement).

The allowed revenue (and parameters used to calculate it) is published by the CRE in its tariff decisions. The revenues collected from auctions are also published yearly, together with the decision regarding the amount of the storage compensation: For 2023, the revenues collected during the auctions cover 40% of the authorized income of storage operators, compared to 25% in 2022. The auctions organized by Storengy and Teréga enabled almost all of the French storage capacities to be subscribed for the winter of 2023-2024. To supplement the revenues collected directly by the storage operators within the framework of these auctions, CRE set the storage tariff term at 186.70€/MWh/d/year from 1 April 1st, 2023¹⁹⁸.

Monitoring and transparency

CRE is responsible for monitoring the implementation of this measure.

Effects on the gas market

Since its entry into force, the main objective of the reform has been achieved: all marketed capacities have been allocated, allowing storage capacities to be filled, which guarantees the security of supply

¹⁹⁶ [Link](#) to Storengy products.

¹⁹⁷ [Link](#) to Teréga products.

¹⁹⁸ Source: CRE ([Link](#)).

of France and, more generally, of the Western European zone. The auction procedures have proven their worth, with a large number of participants and resilience during the gas supply crisis.

The feedback received by CRE during the consultation process for the changes introduced in October 2022 in the mechanism for the conduction of auctions of gas storage capacities, market participants and infrastructure operators are generally satisfied with the auctions and the rules for selling storage capacity that have been in place since 2018. The majority of the respondents was in favour of the changes to the mechanism, providing more flexibility for market participants to book capacity.

Some respondents stressed the changes may not be sufficient to guarantee the subscription and filling of storage facilities next winter in the event of a prolonged negative summer-winter spread. They suggest more far-reaching changes, such as (i) remunerating shippers for subscribing and filling capacity, either by abolishing the reserve price for auctions or by setting up an ad hoc remuneration mechanism and (ii) setting to zero the tariff term of the transmission tariff applicable to the transmission-storage interface points.

Difficulties and risks with the implementation of the measure

Given the tight market conditions for gas storage (high gas price, and low or negative seasonal spread), CRE Decision 2022-251 introduced more flexibility for SSOs to auction their capacities. The decision introduced auction dates that are set freely by SSOs on all working days, in order to adapt to unfavourable and volatile market conditions.

Application of the measure in 2022/23

The application of this measure fully covered the filling trajectories and the filling target for France in 2022 and the same is expected for 2023. The obligation of market participants holding storage capacity to meet their filling obligation of 85% as of November 1st was already in place since 2018. The extent to which the changes of 2022 (increasing the frequency of auctions) contributed to increasing capacity booking (and utilization) cannot be defined.

Appointment of dedicated entity (point (i) of Article 6b)

Implementation of the measure

According to the French Energy Code Article L. 421-7-2, gas SSOs are responsible for filling potential gaps between the filling targets and actual filling levels, as a last resort measure, upon ministerial request. These volumes are considered as security stocks. The implementing Decree was published by the Ministry on August 10th, 2023, but the necessary ministerial ruling has not been published yet. As a result, this measure has not been activated yet.

The Minister responsible for energy, after consulting CRE, must set a filling trajectory for each SSO. This trajectory includes intermediate filling objectives as well as a minimum filling objective on November 1st of each year (the objectives have not been set yet). If the level of storage capacities booked by the market participants (including additional stocks) or the level of utilization of the booked capacities suggests that the filling level at the SSO's facilities will be lower than the minimum set by the filling trajectory, the Minister orders the relevant SSO to constitute the security stocks necessary to meet this minimum target. To do this, the SSOs use, as priority, the unbooked storage capacities of their facilities. They can also mobilise the unused part of the capacity already booked by storage users, including the unused injection/withdrawal capacity to inject / withdraw gas volume.

The SSOs purchase on the market the gas necessary to establish the stocks, according to modalities that will be determined by CRE. The Regulator also sets up the procedure and conditions that SSOs should follow to sell the security stocks.

Recovery of costs associated with implementation of the measure

The costs associated with the establishment by SSOs of the security stocks necessary to respect the filling trajectory, reduced by the income associated with the sale of these stocks, are expenses attributable to public service obligations, which are compensated by the State. Advance payments may be made, upon CRE's decision, if the activity of maintaining the stocks is deemed as possible to compromise the economic viability (particularly the cashflows) of the SSOs.

The costs are socialized (via a tax on consumer bills). The costs will be assessed and validated by CRE. The SSOs will be compensated through the State budget and included in a levy recovered through the bills of both electricity and gas consumers.

Monitoring and transparency

CRE monitors the achievement of the objectives of the filling trajectory and monitors compliance. It defines by deliberation the methods of constitution of security stocks by the operators of the storage facilities and the methods of transfer of these stocks. In particular, it develops tools for predicting a risk of not achieving the filling objectives set by the filling trajectories/targets.

Effects on the gas market

No effects are reported as the measure was not activated, due to the fact that storage levels reached 100% on November 1st, 2022.

Difficulties and risks with the implementation of the measure

There are no difficulties and risks to be reported since the measure has not been activated so far.

Application of the measure in 2022/23

The measure did not contribute to reaching the 2022 filling target. It was not activated due to the fact that the auctions were successful, and the filling levels were high. The same is expected for 2023.

National measures in place prior to the Gas Storage Regulation

Allocation of storage capacity in France has already been carried out via auctions since 2018, including imposing storage filling obligations to holders of booked capacity. Amendments to the regulatory framework in 2022 aimed to facilitate capacity booking, and thus its utilization. This measure has already been described in the Section above (see [Tender of capacities](#)).

Key takeaways

- The underground storage facilities in France have a working volume of 136 TWh, corresponding to approx. 30% of the country's annual gas consumption.
- France has succeeded so far in meeting the filling trajectories and targets, set in the Gas Storage Regulation, as well as the national target (85% on November 1st, 2022). On November 1st, 2022, the filling level was 100%.

- Measures taken in 2022 do not seem to have led to considerably higher volumes of gas in storage compared to pre-2021 levels, as the legal and regulatory framework implemented in 2018 has proven robust and very efficient in ensuring the security of gas supply.
- The French storage framework consists in several mechanisms, most of which have already been in place before the Gas Storage Regulation:
 - Since 2018, storage capacities are allocated via an auction system. Maximisation of capacity sales is enhanced by setting a zero reserve price. Auction rules are set by the regulator CRE, and regularly reassessed and updated (amendments were consulted on and decided by CRE in 2022).
 - The French Energy Code provides for a filling obligation that applies to the shippers holding storage capacities, which requires them to fill up to a minimum level as of November 1st of each year (set at 85% by Decree since 2018). Shippers failing to respect this obligation would face fines and still need to inject gas to meet the obligation.
 - The Law provides the government with the power to impose shippers and/or SSOs to book additional storage capacities, if security of gas supply was to be threatened (this measure is known as the 'safety net').
 - Since 2022 and the Gas Storage Regulation, a new Law has introduced that the Minister responsible for energy sets, after consulting CRE, a filling trajectory for each gas storage operator. This trajectory includes intermediate filling objectives as well as a minimum filling objective on November 1st of each year. In 2022, the measure was not activated as the auctions went well, and the filling levels were high. The same is anticipated for 2023.
- CRE is responsible for monitoring these measures.

Germany

Overview

Gas storage infrastructure (August 1 st , 2023)	
Aggregate GWV	250.1 TWh
Injection capacity	4467.2 GWh/d
Withdrawal capacity	7107.3 GWh/d

Storage filling targets of Gas Storage Regulation and actual gas in storage					
	2022			2023	
	Target	Actual		Target	Actual
1 August	45%	69%	1 February	45%	78%
1 September	53%	85%	1 May	10%	67%
1 October	80%	92%	1 July	30%	80%
1 November	80%	99%	1 September	65%	94%
			1 November	90%	N/A

Measures applied in the MS for gas storage			
a) Minimum volume in gas storage		f) Financial incentives for market participants	
b) Tender of capacities		g) Unused booked capacities	✓
c1) Balancing stock managed by TSO		h) Strategic storage	✓
c2) Obligations imposed on designated entities	✓	i) Appointment of dedicated entity	✓
d) Coordinated instruments		j) Discounts on storage tariffs	
e) Voluntary joint procurement mechanisms		k) Capital and operational expenditures	
Other			

Applicable legal and regulatory framework

The German Energy Industry Act (EnWG) was amended in April 2022¹⁹⁹, a few months before the Gas Storage Regulation entered into force, with the Gas Storage Act (Part 3a; Sections 35a to 35g EnWG) that introduces storage level requirements, and measures to attain them.

On July 29th, 2022, the Federal Ministry for Economic Affairs and Energy (BMWK) issued an Ordinance²⁰⁰ (Gas Storage Level Ordinance) adjusting and supplementing the storage level requirements.

¹⁹⁹ [Link](#) to the EnWG.

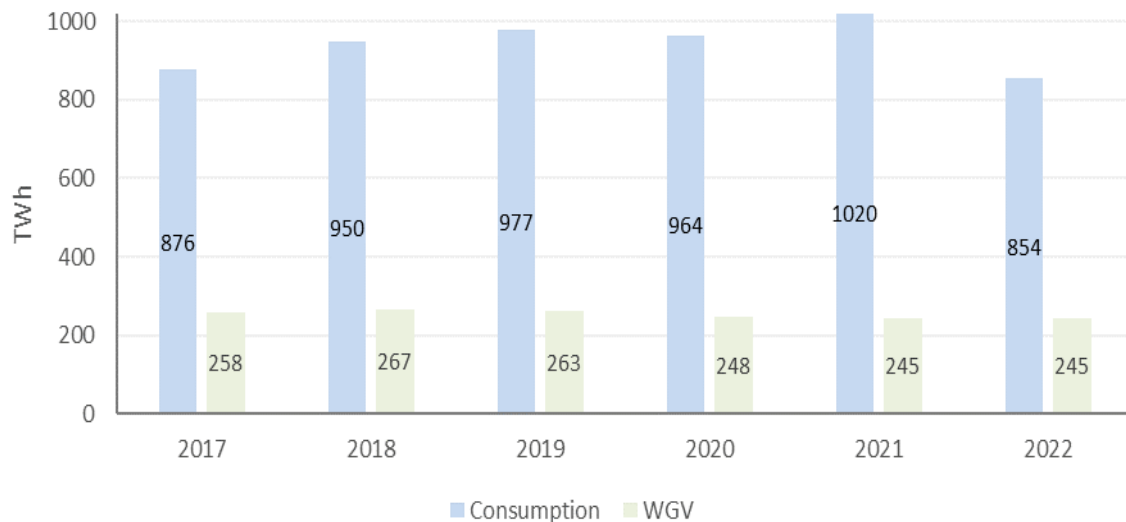
²⁰⁰ [Link](#) to Gas Storage Level Ordinance.

Following the Gas Storage Act, the Federal Network Agency (BNetzA) issued Decision BK7 - 22-052²⁰¹, that approved the methodology for the design of the neutrality charge proposed by the market area manager, as stipulated in Section 35e EnWG. Prior to the approval of the methodology, a consultation with market participants took place, and feedback received was incorporated in the approved version of the methodology.

Gas storage infrastructure

The underground gas storage infrastructure in Germany has a total gas working volume of 250 TWh, withdrawal capacity of 7,107 GWh/d and injection capacity of 4,467 GWh/d²⁰². Although Germany has the largest storage capacity in the EU, accounting for over 20% of the Union’s working volume, this capacity corresponds to less than 30% of the country’s annual gas consumption. Figure 51 shows how the storage capacity compares to the annual consumption for the period 2017 to 2022.

Figure 51: Storage capacity and annual gas consumption from 2017 to 2022²⁰³



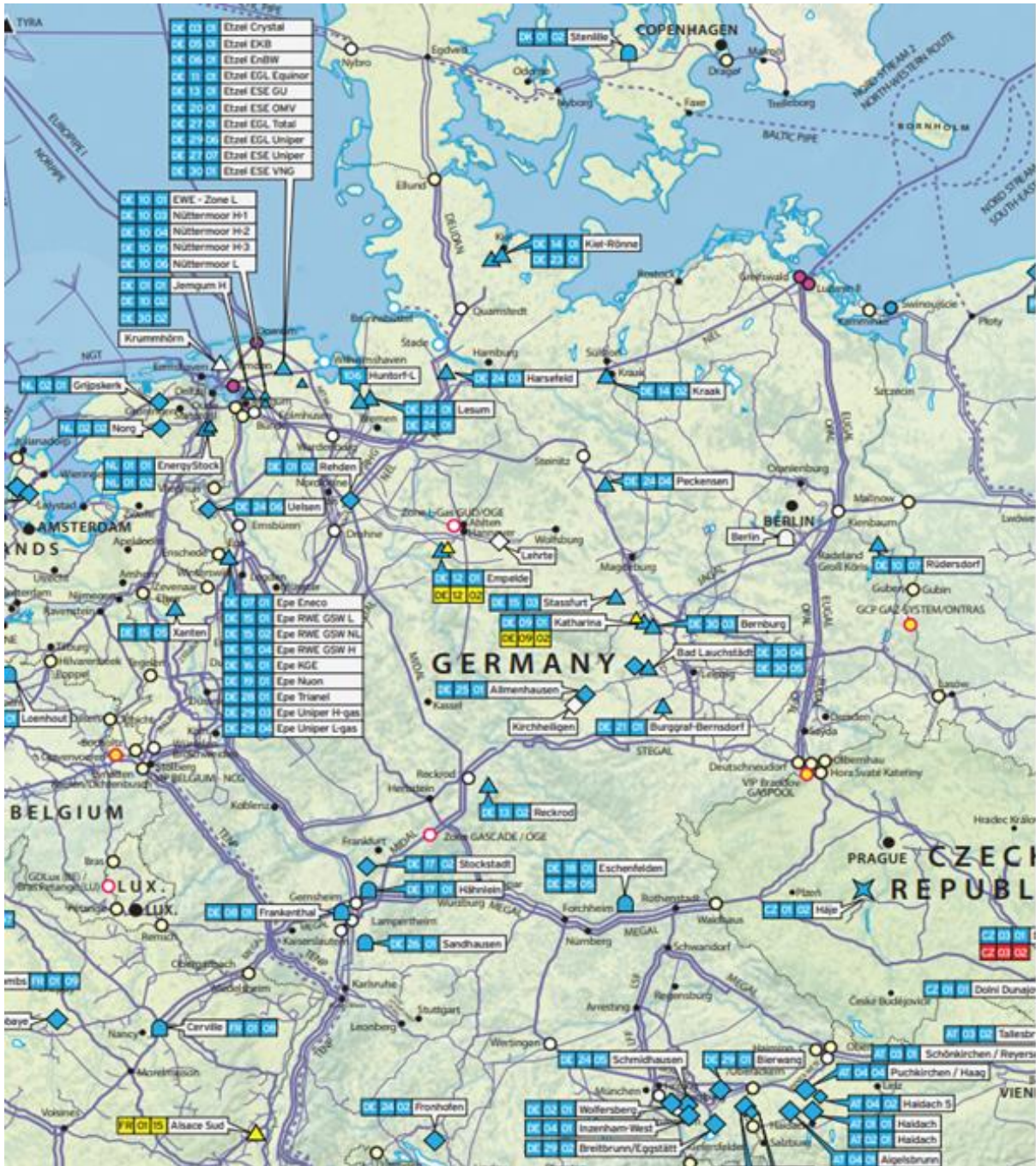
Germany has around 50 underground gas storage facilities, the largest being UGS Rehden (operated by Astora), with a capacity of 43.7 TWh. The locations of the country’s storage facilities are presented in the map below.

²⁰¹ [Link](#) to Decision BK7 - 22-052.

²⁰² Source: GIE (August 1st, 2023).

²⁰³ Sources: GIE, Eurostat.

Figure 52: Underground gas storage facilities in Germany²⁰⁴



The storage facilities in Germany are operated by multiple SSOs: Astora (Germany), Bayernugs, EDF Gas Deutschland, EnBW Etzel Speicher, Eneco Gasspeicher, Enercity, Enovos Storage, Equinor Storage Deutschland, Erdgasspeicher Peissen, EKB, EWE Gasspeicher, Hansewerk, KGE, MET Speicher, MND Energy Storage Germany, Nafta Speicher Inzenham, Nuon Epe Gasspeicher, OMV Gas Storage Germany, RWE Gas Storage West, Storengy Deutschland, SWKiel Speicher, TEP, Trianel Gasspeicher Epe, Uniper Energy Storage, VNG Gasspeicher GmbH. The technical characteristics of the facilities operated by each SSO (aggregate values of all facilities) are presented in Table 78.

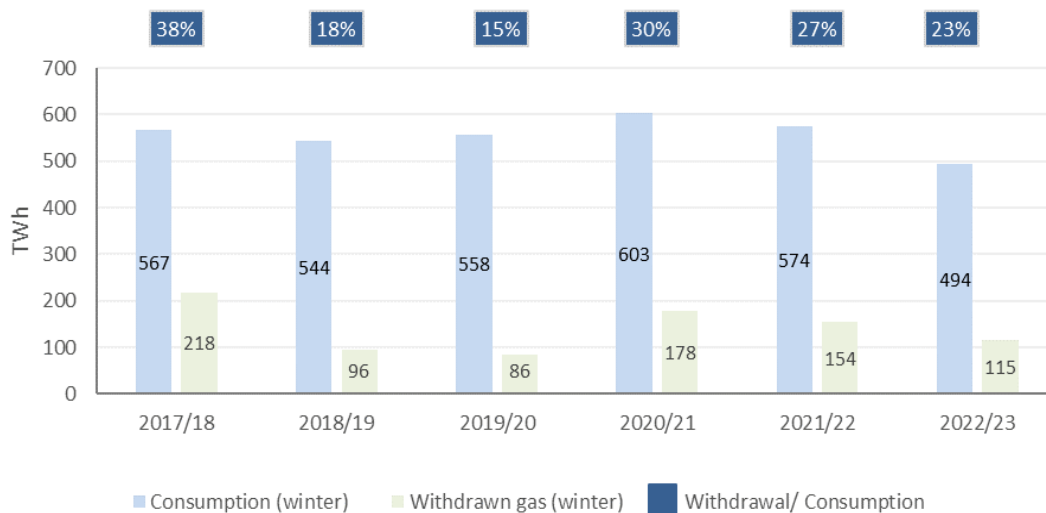
²⁰⁴ Source: GIE storage Map.

Table 78: Gas storage operators and infrastructure

Name	GWV (TWh)	Injection (GWh/d)	Withdrawal (GWh/d)
Astora (Germany)	52.78	489.9	753.51
Bayernugs	4.12	279.65	65.09
EDF Gas Deutschland	1.99	54	94.5
EnBW Etzel Speicher	2.12	54	94.5
Eneco Gasspeicher	1.44	46.8	93.6
Enercity	2.25	19.7	73.92
Enovos Storage	0.97	9.68	16.13
Equinor Storage Deutschland	2.2	210.67	361.15
Erdgasspeicher Peissen	6.06	134.58	269.16
EKB	10.57	0	0
EWE Gasspeicher	17.83	241.34	504.48
Hansewerk	2.39	48.38	80.64
KGE	2.06	41.04	109.44
MET Speicher	3.05	80.59	97.37
MND Energy Storage Germany	2.33	32.74	49.01
Nafta Speicher Inzenham	4.92	45.79	66.5
Nuon Epe Gasspeicher	2.77	84.97	141.61
OMV Gas Storage Germany	4.93	71.76	118.56
RWE Gas Storage West	17.17	287.38	725.83
Storengy Deutschland	18.67	232.27	528.13
SWKiel Speicher	0.63	11.52	27.12
TEP	0.91	10.8	13.32
Trianel Gasspeicher Epe	2.12	82.66	165.31
Uniper Energy Storage	61.04	1298.76	1770.72
VNG Gasspeicher GmbH	24.74	598.178	887.71

Gas storage operation and filling targets

In 2022 withdrawals from the German gas storages during the winter period (November of one year to March of the next) covered 23% of demand in these months. In the past, the share of gas withdrawals in gas demand ranged significantly, from 15% in 2019/20 to 38% in 2017/18 (Figure 53).

Figure 53: Use of gas storage to cover demand in the winter season²⁰⁵


The filling targets and trajectories for Germany in 2022 and 2023, as established in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301, are presented in the Table below. Germany has set national targets with the EnWG and a subsequent Ordinance, which are different from the targets in the Gas Storage Regulation, for the milestones in October, November, and February (the targets concern each storage facility separately). For November 1st, 2022, the national target (95%) was significantly higher than the 80% set by the Regulation.

 Table 79: Targets and trajectories for Germany in 2022 and 2023²⁰⁶

2022	1 August		1 September		1 October		1 November				
	EC	NT ²⁰⁷	EC	NT	EC	NT	EC	NT			
	45%		53%		80%	85%	80%	95%			
2023	1 February		1 May		1 July		1 September		1 October	1 November	
	EC	NT	EC	NT	EC	NT	EC	NT	NT	EC	NT
	45%	40%	10%		30%		65%		85%	90%	95%

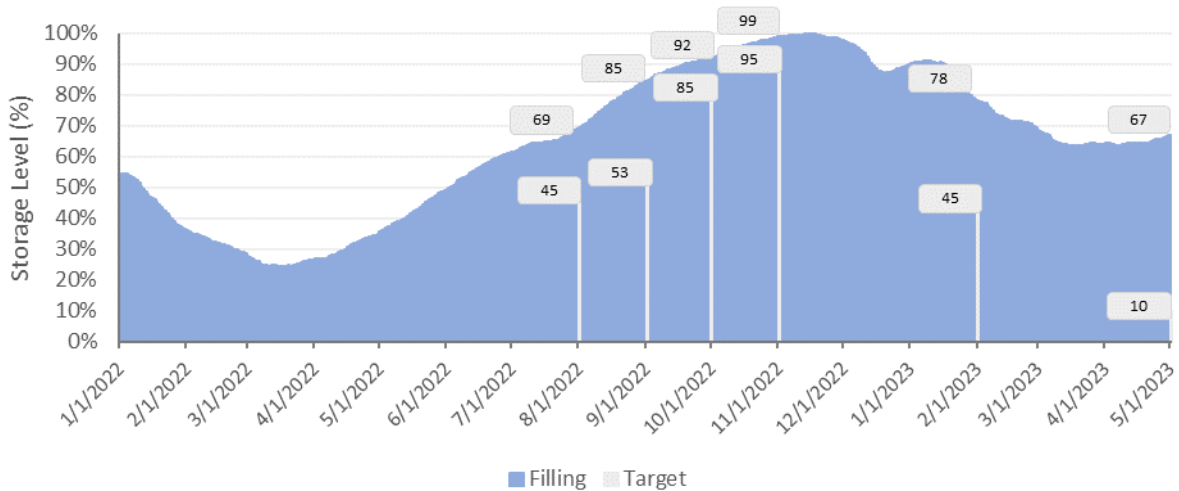
Germany has succeeded in meeting the targets of both the Gas Storage Regulation and EnWG for 2022 and 2023 (so far), as shown in Figure 54. On November 1st, 2022, the filling level reached 99%, and remained at very high levels throughout 2023.

²⁰⁵ Source: GIE, OMV, Hansewerk, VNG, Eurostat.

²⁰⁶ Filling trajectories and targets as stated in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301, and national targets according to EnWG and Ordinance of July 27th, 2022 ([Link](#)).

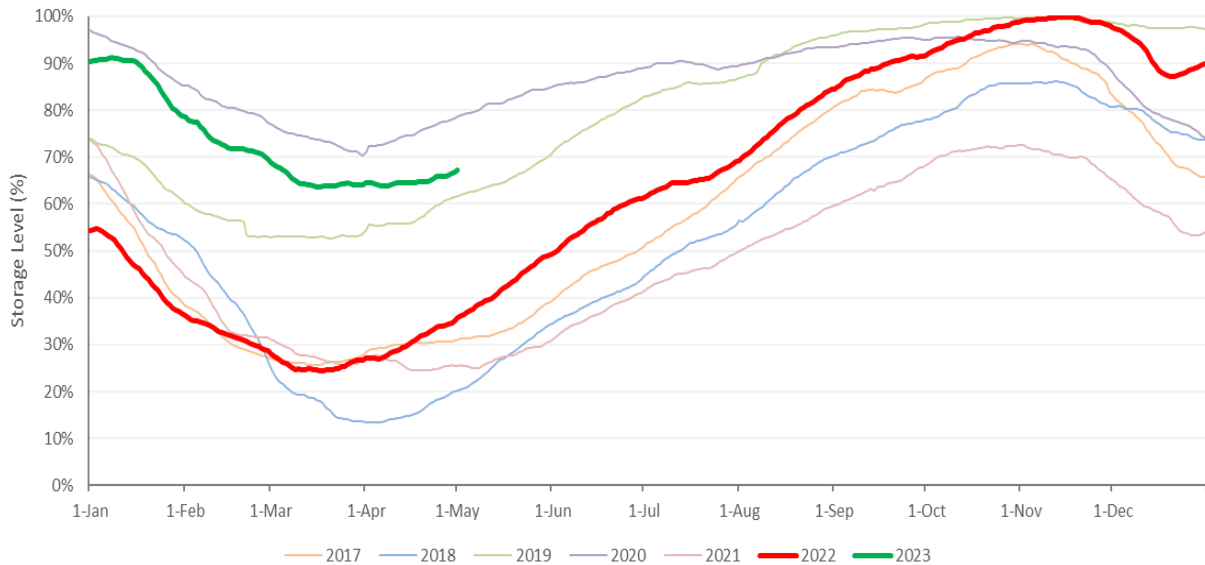
²⁰⁷ EC: Target by Gas Storage Regulation and NT: National Target.

Figure 54: Daily gas in storage vs filling targets in 2022 and 2023^{208,209}



The filling level in Germany in the summer of 2022 was considerably lower than in 2019 and 2020. However, by mid-November 2022 storages were completely full, following the trend of past years (2017, 2019, 2020) that storages were filled above 90%. In the beginning of 2023 filling levels remained higher than most of the previous years, except in 2020 (Figure 55). Overall, measures implemented in 2022 appear to have led to high filling levels that were observed in 2019 and 2020.

Figure 55: Comparison of daily gas filling trends between 2017 and 2023²¹⁰



Overview of national measures

The Gas Storage Act calls for a set of measures to be undertaken by the market area manager, Trading Hub Europe (THE), in order to ensure that the minimum storage levels foreseen in the Act are achieved. The measures apply only to storage facilities located in Germany with a transmission system exit to the THE market area. These measures comprise three “stages”:

²⁰⁸ Source: GIE, OMV, Hansewerk, VNG.

²⁰⁹ Where targets from the Gas Storage Regulation and national targets apply, the highest is reported.

²¹⁰ Source: GIE, OMV, Hansewerk, VNG.

- Stage 1 involves market-based activities by the market participants for filling storage facilities for their own use, as well as tenders for storage options by THE to increase the filling levels.
- In stage 2 THE can conduct additional short-term tenders for storage options, to meet the filling targets.
- In stage 3 THE can proceed with its own purchases of gas and injection in storage facilities to cover any differences between actual and targeted gas stocks.

The three stages described above do not have to be carried out in a specific merit order and can be combined with each other. The costs of THE for implementing the measures are recovered through a compensation mechanism. Part of the tendered storage options must be maintained in the storage facilities, as strategic stocks, to be made available to THE, if the later exercises a call-off request.

To support implementation of these measures, the SSOs may release to THE booked but unused capacity of storage users.

The measures foreseen in the Gas Storage Act are valid until March 31st, 2025. On May 12th, 2023, the BMWK announced that it advocates for an extension of the Gas Storage Act by two years until March 31st, 2027²¹¹, however this amendment to the Law has not been formalized yet.

The mechanism outlined above combines a number of measures from the list of Article 6b(1) of the Gas Storage Regulation:

Measure	Implementation	Relevance to Article 6b(1) measures
Obligation of THE to conduct tenders for storage options in stages 1 and 2.	From 2022 to 2025 (potential extension to 2027)	Imposing an obligation on other designated entities for the purpose of safeguarding the security of gas supply in the case of an emergency (point c2).
Right of SSOs to release booked but unused capacity of storage users to THE.	From 2022 to 2025 (potential extension to 2027)	Requiring storage capacity holders to use or release unused booked capacities, while still obliging the storage capacity holder not using the storage capacity to pay the agreed price for the whole term of the storage contract (point g).
Part of the storage options tendered by THE must be maintained by the service providers in storage with a call-off option by THE.	From 2022 to 2025 (potential extension to 2027)	Adopting effective instruments for the purchase and management of strategic storage by public or private entities (point h).
Possibility of THE to purchase and inject in storage facilities its own gas volumes, to meet the filling targets.	From 2022 to 2025 (potential extension to 2027)	Appointing a dedicated entity tasked with meeting the filling target in the event that the filling target would not otherwise be met (point i).

These measures are analysed in detail below.

²¹¹ Source: Trading Hub Europe news ([Link](#)).

National measures implemented due to the Gas Storage Regulation

Obligations imposed on designated entities (point c2 of Article 6b)

Implementation of the measure

Section 35a EnWG assigns to the market area manager, THE, the obligation to ensure security of supply and take appropriate measures with a view to meeting the storage level requirements of the Gas Storage Act. THE's main mechanism, pursuant to Section 35c(1) EnWG, is the procurement of strategic storage options, under market-based, transparent, and non-discriminatory public tendering procedures. Any such tender for strategic storage options by THE must be first approved by BMWK and BNetzA.

In this context, THE carries out public tenders at its bidding platform, to sign contracts for Strategic Storage-Based Options (SSBO) products. The providers of SSBO products offer to THE the following:

- Ensuring that specific percentages of the contractually agreed gas quantities are stored at a defined storage facility at specific dates (contracted storage quantity), and
- Continuously maintaining part of the contractually agreed gas quantities at the storage facility, to be available for THE to call-off at any time (call-off quantity)²¹².

THE launches tenders by publishing in its website invitations to tender. Depending on the needs for storage filling, the tenders may have nation-wide coverage (market area tenders) or concern specific storage zones (zone-specific tenders) or specific storage facilities (storage-specific tenders). Participation to these tenders is allowed to balancing group managers of THE's market area that have undergone through prequalification, following a procedure published by THE²¹³. The bidders must determine the storage facility they offer as delivery point.

The terms and conditions for SSBO products for 2022/23 have been published by THE²¹⁴. Adjustments for future tenders are possible. According to the current terms and conditions, the contracts for SSBO products commence on October 1st of a year until February 1st of the subsequent year, and during this contract period, providers have to keep in storage:

- At least 90% of the contracted storage quantity on October 1st.
- 100% of the contracted storage quantity on November 1st.
- At least 45% of the contracted storage quantity on February 1st.
- 20% of the contracted storage quantity throughout the contract, as call-off quantity.

In case THE has previously issued a call order for the call-off quantity, the percentages above are reduced accordingly.

The provider of the SSBO product is responsible for booking adequate storage capacity (working gas quantities and injection rates), as well as exit capacity at the transmission system to which the storage facility is connected. Both injection capacity and transmission exit capacity can be interruptible, however the provider bears the risks of interruption and not being able to provide the SSBO product.

²¹² The call-off quantities are strategic stocks, and are thus further described in the section below, detailing the measure "[Strategic storage](#)".

²¹³ THE Prequalification Rules for Participation in Tenders for SSBO Products ([Link](#)).

²¹⁴ THE Terms and Conditions Governing the Conclusion of Contracts for and the Use of Stage 1 "Strategic Storage-Based Options" ([Link](#)).

For the SSBO product, the provider charges to THE:

- A fee for keeping the foreseen quantities in storage (service fee), which remains constant throughout the contract period.
- A charge for ensuring the availability of the call-off quantities (capacity charge), which remains constant throughout the contract period.
- A charge for the withdrawal of gas quantities (in €/MWh), in case THE exercises its call-off rights (commodity charge). The commodity charge is payable only if a call order is issued by THE and is applied on the gas quantities requested by THE. The charge comprises the day-ahead (D+1) index price "EEX European Gas Spot Index (EGSI) THE €/ MWh" for day D, adjusted by a premium or discount that the provider offers during the SSBO tender.

During a tender for SSBO products, the bids are ranked in accordance with the total projected costs in Euro, as an aggregate of the service fee, the capacity charge, and the total commodity price²¹⁵. For market area tenders, the bids are ranked regardless of the storage facility to which each bid corresponds, for zone-specific tenders all bids within the zone are ranked together, while for storage-specific tenders the ranking takes place separately for each facility.

THE may impose penalties to providers in case they are not compliant with the requirements of their SSBO contract. These penalties depend on the service that the provider failed to offer:

- In case the provider failed, wholly or partially, to store the required quantities on the due date, then the penalty (P) to be paid by the provider amounts to:

$$P = SQ \cdot 0.33 \cdot SF_{Avmax} \cdot 2$$

where:

- SQ: Percentage points (%) of quantities short of the targeted quantities
- SF_{Avmax} : The highest between the service fee offered by the provider and the unit price of service fees of all providers for the storage zone, which is assigned to the respective storage facility, multiplied by the contracted quantity of the provider
- In case the provider failed, wholly or partially, to maintain the required call-off quantities, then the penalty (P_d) to be paid by the provider for each day of breach amounts to:

$$P_d = CaC_d \cdot 2$$

Where CaC_d is the total capacity charge per day corresponding to the whole contract period.

- In case the provider failed to make available to THE, wholly or partially, call-off quantities upon request, then the penalty (P_D) to be paid by the provider for each day of breach amounts to:

$$P_d = SQ_c \cdot CoC_d \cdot 2$$

Where:

- SQ_c : Quantity short of the call-off quantity (MWh)
- CoC_d : average of the commodity charge (€/MWh)

²¹⁵ Calculated as the product of call-off quantities, premium/discount offered, and a probability factor for the occurrence of the call-off.

If the provider breaches several of its obligations at the same time, then the highest of the relevant penalties applies. In the event of multiple breaches of obligations during a contract period, the individual penalties are aggregated, and THE applies a maximum penalty of 200% on the price components in each case, for the entire contract period.

No penalties are foreseen for THE in case the targets of the Gas Storage Regulation or the national targets are not met.

Recovery of costs associated with implementation of the measure

According to Section 35e EnWG, THE must pass on its costs for implementing its tasks ensuring security of supply to the balancing group managers of the market area, in a non-discriminatory and transparent process. To this end, THE applies a neutrality charge, incorporating its costs and revenues from implementing the measures, to ensure that the market area manager will not gain or lose from its security of supply activities. The methodology for the design of the neutrality charge is approved by BNetzA (the current methodology has been approved with Decision BK7 - 22-052), and the basis for calculating the charge is published by THE in its website.

THE's methodology approved by BNetzA provides that the costs and revenues are calculated for the whole period through which the Gas Storage Act is in force (reference period), and the neutrality charge is calculated in shorter apportionment periods, with a 3- or 6-months' duration:

- An initial 3-month period from October 1st, 2022, to December 31st, 2022.
- 6-month periods between January 1st, 2023, and December 31st, 2024.
- A final 3-month period from January 1st, 2025, to March 31st, 2025.

It is noted that although BNetzA's decision refers to a reference period up to March 31st, 2025, in the latest calculation of the neutrality charge, for the period July 1st, 2023, to December 31st, 2023²¹⁶, THE takes into account a period up to March 31st, 2027, due to a possible extension of the Gas Storage Act until that date.

Calculation of the neutrality charge takes into account all costs and revenues of THE related to implementing the measures of the Gas Storage Act:

- Costs may include:
 - Procurement of SSBO products by THE (in stages 1 and 2).
 - Procurement and injection of gas by THE (in stage 3)²¹⁷.
 - Call orders for call-off quantities.
 - Financing costs for THE's security of supply activities.
 - Human and material resources.
- Revenues concern sales of gas that has been procured and stored by THE (in stage 3).

Each apportionment period, any surplus or deficit from the previous period is included in the neutrality charge. THE publishes the evolution of the neutrality account, providing its monthly balance since the start of the reference period.

²¹⁶ THE, Statement of the Basis of the Gas Storage Neutrality Charge ([Link](#)).

²¹⁷ This measure is further described in the section below, detailing the measure "[Appointment of a dedicated entity](#)".

The neutrality charge is imposed on the volumes that a balancing group physically withdraws at exit points connecting users with standard load profiles or metered load profiles and at cross-border IPs/VIPs (i.e., quantities subject to the application of the neutrality charge).

Based on the above, the neutrality charge is calculated according to the formula below:

$$\text{Neutrality charge}_{p+1} = \frac{\text{neutrality charge account}_p + \sum \text{projected costs}_n - \sum \text{projected revenues}_n}{\sum \text{projected quantity subject to neutrality charge}_n}$$

Where p is the apportionment period and n is the reference period.

Monitoring and transparency

BMWK, together with BNetzA are responsible for monitoring the implementation of the Gas Storage Act, and particularly the achievement of the storage filling obligations. The SSOs are responsible for providing to BMWK, BNetzA and THE proof of compliance with the filling trajectories and targets. Additionally, each SSO must submit to BNetzA, and THE information related to the filling levels, gas stocks in its storage facilities and proof that the respective gas storage facility meets the requirements. During this monitoring, the filling level of each storage user at each storage facility is examined, to ensure that appropriate actions for storage filling are taken if necessary.

Additionally, THE monitors the progress of the providers of SSBO products in fulfilling their filling targets. THE reserves the right to ask from the provider, and from the SSO of the respective storage facility information that the provider meets its obligations.

The activities of THE related to security of supply are carried out in a transparent manner. THE publishes at its website:

- All information and documentation related to the tenders of SSBO products, including invitations to tender, rules for participation, contractual terms and conditions, results of the tenders (volumes and costs).
- Information related to gas volumes purchased and stored by THE (stage 3) and the part of these that has been sold.
- Neutrality charge, its calculation basis and monthly balance of the neutrality account.

However, the rationale on the basis of which THE proposes to BMWK and BNetzA to undertake procuring SSBO products, or procuring and injecting gas in storage facilities, is not published.

Effects on the gas market

No effects on the gas market have been reported.

Difficulties and risks with the implementation of the measure

Some issues related with the implementation of SSBO tenders are the following:

- The SSBO tenders were launched by THE after the injection period had commenced. As a result, interest for storage filling obligations was limited, and THE had to procure significant gas volumes on its own.
- The tenders carried out by THE sought to procure SSBOs at storage regions rather than at specific storages. This does not take into account the physical characteristics of individual facilities.
- Interruptible storage capacity should not be used within for enhancing security of supply.

Another issue is definition of the gas quantities to be procured via SSBO tenders. Cost efficient use of these tenders requires estimation of the required gas quantities, on top of the market-based quantities the market players will inject into the storage facilities. The market players' storage activity however is hard to predict, as last year's structural changes in the supply mix with the stop of Russian gas imports make it harder to rely on historic behaviour of market players to predict filling of storages in the future.

Application of the measure in 2022/23

THE conducted two tenders for SSBO products²¹⁸ in 2022, one launched on May 9th, 2022, and one on May 30th:

- In the first tender, THE requested SSBO products corresponding to a total gas volume of 59,605 GWh, of which 11,921 GWh as call-off quantities. As a result of this tender, 48,295 GWh were awarded, of which 9,659 GWh as call-off quantities. The total costs for the awarded quantities amount to 371 mil. €, of which 200.5 as service fee (contracted storage quantities) and 170.5 as capacity charge (call-off quantities). The average surcharge on the index price for the call option amounted to 13.6 €/MWh, ranging significantly however, from 0 to 300 €/MWh.
- In the second tender, THE requested SSBO products corresponding to a total gas volume of 35,717.5 GWh, of which 7,143.5 GWh as call-off quantities. All of the requested quantities were awarded. The total costs for the tender amounts to 481 mil. €, of which 232 as service fee (contracted storage quantities) and 249 as capacity charge (call-off quantities). The average surcharge on the index price for the call option amounted to 19.7 €/MWh, ranging significantly however, from a discount of 20 €/MWh to a premium of 200 €/MWh.

The total gas quantities secured by THE as storage options via these tenders amounted to 84 TWh, at a cost of 852 mil. €. The unit cost of this measure is therefore 10.1 €/MWh. This cost relates only to the storing of gas by providers of SSBO products but excludes potential costs in case THE exercises its call-off rights (which were not realized in 2022/23).

THE's costs for implementing its security of supply activities are recovered through the neutrality charge. The neutrality charge was initially set at 0.59 €/MWh for the period October 1st to December 31st, 2022, and remained unchanged in the next period from January 1st, 2023, to June 30th, 2023. The charge then more than doubled, amounting to 1.45 €/MWh from July 1st, 2023, to December 31st, 2023. The latest charge incorporates a change in the calculation period for costs and revenues, which was changed by THE, following agreement with BNetzA, from March 2025 to March 2027²¹⁹.

No SSBO tenders were conducted by THE in 2023.

Unused booked capacities (point g of Article 6b)

Implementation of the measure

In case it is apparent that the storage level requirements defined in the Gas Storage Act cannot be achieved at a storage facility, because a storage user has booked firm storage capacity but is not using it, then Section 35b(5) EnWG obligates SSOs to make available to the market area manager, THE, the booked but unused capacity, including the injection and withdrawal rates. The capacity released from each storage user is proportionate to its unused capacity necessary to meet the filling targets of the

²¹⁸ Source: THE website: "Results SSBO tender level 1" ([Link](#)).

²¹⁹ This change is due to the expected 2-year extension of the measures that has been announced by BMWK.

storage facility. The capacity must be released to THE in a timely manner, to ensure that the filling targets can be met.

The storage user, which had its booked capacity released, must still pay to the SSO the storage usage fees, with the exception of variable fees for injection and withdrawal (i.e., the energy costs incurred during gas injection to and withdrawal from the storage facility).

According to Section 35b(6) EnWG, the SSOs must introduce in the contract for access to their storage facilities, provisions that allow the SSO to release unused capacity to THE. For contracts signed before April 30th, 2022, these provisions applied after July 14th, 2022. If a storage user did not agree with the provisions related to Section 35b until July 1st, 2022, the SSO had the right to terminate the contract without notice.

The SSOs have amended their terms and conditions, to include the required provisions of the Gas Storage Act. For example, Storengy Deutschland GmbH has added in its general terms and conditions²²⁰ checkpoints that allow the SSO to identify cases of storage users that are not utilizing their booked capacity sufficiently for the facility to meet the filling targets:

- The storage users should use their contracted firm and/or interruptible injection rate to result in a filling level of their working gas accounts at a minimum of:
 - 85% of their booked capacity on October 1st, starting in 2022
 - 95% of their booked capacity on November 1st, starting in 2022
 - 40% of their booked capacity on February 1st, starting in 2023
- In the beginning of July of each year (until the expiry of the measures in March 2025), the SSO shall inform the storage users of the filling level required in their working gas accounts, particularly to ensure that the storage facility will reach the 75% minimum filling level on September 1st, as foreseen in the Gas Storage Level Ordinance.
- If the working gas volume at a storage facility is below the levels below (indicating risks in meeting the filling target of September 1st), the SSO must make available to THE, to the maximum possible extent, the booked capacity of all storage users, including their injection rate:
 - Below 10% on June 2nd, 2022.
 - Below 5% on May 1st, starting in 2023
 - Below 10% on June 1st, starting in 2023

Before releasing the capacity to THE, the SSO endeavours to notify the relevant storage user(s), to allow them to undertake actions for utilizing the booked capacity to meet the required filling levels. Nevertheless, the SSO must ensure that capacity is made available to THE with sufficient time to undertake actions to fill the relevant storage facility.

The measure is in effect until May 31st, 2025 (i.e., until the expiry of the provisions of the Gas Storage Act).

²²⁰ Storengy Deutschland GmbH, General Terms and Conditions for the Storage of Gas, ([Link](#)).

Recovery of costs associated with implementation of the measure

No specific mechanism for recovery of costs associated with this measure is foreseen, as the storage users having their capacity released are still required to pay the storage tariff, excluding the variable costs for injection and withdrawal.

Monitoring and transparency

As stipulated in Section 35b(6), BNetzA may request from the SSOs evidence for the implementation of their obligations under this measure. To this end, some SSOs (such as RWE Gas Storage West) request from their storage user's information related to their filling level in relation to the storage capacity they have booked on a firm basis.

The SSOs are not required to publish information related to booked and unused capacity of storage users that has been made available to THE.

Effects on the gas market

No effects on the gas market have been reported.

Difficulties and risks with the implementation of the measure

No difficulties and risks have been reported with relation to the implementation of this measure.

Application of the measure in 2022/23

No storage capacity was released by the SSOs in 2022 and 2023.

Strategic storage (point h of Article 6b)

Implementation of the measure

Section 35d(1) EnWG requires the market area manager, THE, to use strategic storage options procured via tenders as well as gas stocks procured and maintained by THE itself, in order to prevent or mitigate disruptions of energy supply, compensate for an unexpected and significant reduction of gas supplies, or eliminate regional bottlenecks. To ensure the availability of gas to carry out this task if required, THE has included in the SSBO product the obligation of the provider to maintain part of its contracted gas quantities at the storage facility, to be available for THE to call-off at any time (see measure [Obligations imposed on designated entities](#) above). This call-off quantity is currently set by THE at 20% of the contracted quantities of the provider.

The decision to release the call-off quantities is taken by BMWK, in agreement with BNetzA, and after consulting THE. To release the quantities, THE issues a call order to the provider of the relevant SSBO product. In these orders, priority is given to the SSBO products in storage facilities that would address the emergency more effectively. The suitable SSBO products are in turn ranked in accordance with their cost, from lowest to highest.

A call order must be issued by THE with a lead time of at least 3 hours. The quantities must be withdrawn with a constant hourly flow rate. The provider of the SSBO product must ensure that withdrawal capacity at the facility and entry capacity at the transmission system are available. Booking of interruptible capacity is allowed, however in this case the provider bears the risks of interruption and not being able to provide the call-off quantities as requested.

THE may impose penalties to providers in case they fail, wholly or partly, to maintain the required call-off quantities in storage, or to be unable to provide the quantities upon a call order (see measure [Obligations imposed on designated entities](#) above).

Filling of the storage facilities, following the release of the call-off quantities, is decided by BMWK, in agreement with BNetzA, and after consulting THE. Depending on this decision, THE may be required to carry out additional tenders for SSBO products.

Recovery of costs associated with implementation of the measure

THE recovers the costs for maintaining call-off quantities, and the costs for releasing these quantities, if required, through the neutrality charge, described in the measure [Obligations imposed on designated entities](#) above.

Monitoring and transparency

Monitoring of the measure's implementation is carried out by BMWK and BNetzA, within the frame of monitoring application of the whole Gas Storage Act, as described in the measure [Obligations imposed on designated entities](#) above.

THE publishes in its website information about the results (quantities and costs) of the SSBO tenders, which also include the contracted call-off quantities, and their corresponding capacity and commodity charges agreed with the providers of the SSBO products.

Effects on the gas market

The obligation set to THE by the Gas Storage Act to make available gas quantities if required upon request by BMWK and BNetzA results in the need to create gas stocks. This obligation is passed on to the market participants that are contracted to offer SSBO products, who have to keep 20% of the contracted quantities in storage between October and February.

The SSBO products aim to act supplementary to the gas volumes that market participants would store in the storage facilities on their own, with a view to meeting the storage level obligations by the respective due dates. If the SSBO tenders are properly sized and planned, the working volume at the storage facilities that is reserved for the strategic options would not correspond to capacity sought after by market participants and would therefore not affect the storage flexibility potential that the market would like to use. On the other hand, however, if SSBO tenders intersect with capacity that market participants intend to use, then there is a risk of reducing the flexibility potential of the respective storage.

Difficulties and risks with the implementation of the measure

No difficulties with the implementation of the measure have been reported. However, as described in the section above, market participants have noted concerns in relation to the measure's benefits in security of supply, and its impact on the flexibility potential of storage.

Application of the measure in 2022/23

With the two SSBO tenders conducted in May 2022, THE secured call-off quantities of 16,802.5 GWh for the period October 1st, 2022 – February 1st, 2023 (9,659 GWh from the first tender and 7,143.5 GWh from the second). The cost for these quantities (aggregate capacity charge of the contracted SSBO products in the whole market area) amounts to around 420 mil. € (170 mil. € for the first tender and 249 mil. € for the second)²²¹.

THE was not required to release the call-off quantities in 2022 and 2023. Test call orders were carried out by THE, without identifying any issues or inefficiencies in the procedure.

²²¹ Source: THE website: "Results SSBO tender level 1" ([Link](#)).

Appointment of dedicated entity (point i of Article 6b)

Implementation of the measure

Section 35c(2) EnWG assigns to the market area manager, THE, to undertake supplementary actions, following approval by BMWK and agreement with BNetzA, in case the stage 1 SSBO tenders do not provide sufficient filling of the storage facilities to meet the minimum storage levels foreseen in the Gas Storage Act. These supplementary actions may either be short-term tendering of SSBO products (stage 2) and/or procurement and storing of physical gas quantities by THE.

THE has not issued documentation, such as prequalification rules, terms, and conditions, etc., for stage 2 SSBO tenders (the available documentation concerns stage 1 tenders).

According to Section 35d(4), in case THE has procured gas quantities and stored them in storage facilities, it must sell these quantities at the latest from January 1st to the end of the respective storage year. However, if the filling targets for the next period are not guaranteed without resorting to additional measures, THE may refrain from selling its gas quantities, unless this is requested by BMWK in agreement with BNetzA.

Recovery of costs associated with implementation of the measure

THE recovers the costs for procuring its own gas quantities and storage capacity, and for conducting short-term tenders through the neutrality charge, described in the measure [Obligations imposed on designated entities](#) above.

Monitoring and transparency

Monitoring of the measure's implementation is carried out by BMWK and BNetzA, within the frame of monitoring application of the whole Gas Storage Act, as described in the measure [Obligations imposed on designated entities](#) above. In addition, THE must submit to BMWK and BNetzA information related to sales of procured and stored gas quantities.

THE publishes in its website information about the volumes of gas quantities it has purchased, and the amount of these that it has sold back. Additionally, through the reporting for the neutrality account, THE publishes in its website information on the costs and revenues of gas purchases in stage 3.

Effects on the gas market

Market participants have voiced concerns over the large gas quantities that THE purchased in 2022. They consider that the measure was not used as a last resort mechanism, as originally intended, since THE proceeded with buying gas instead of performing additional tenders for SSBO products. Gas procurement decisions were policy-driven, to meet the filling targets, instead of market-based, resulting in THE purchasing gas at very high spot prices in Q3 of 2022. Considering that recuperating from these high costs is not likely, THE's deficit would have to be recovered through the neutrality charge, affecting gas prices for a long period. Furthermore, the timing that THE will proceed with releasing this gas to the market would potentially distort prices, providing non-market based signals.

Difficulties and risks with the implementation of the measure

No difficulties have been reported with relation to the implementation of this measure. There have, however, been concerns with regards to the impact of the measure on the operation of the gas market, as described above.

Application of the measure in 2022/23

THE announced²²² that in 2022 it procured nearly 50 TWh, which was stored in various storage facilities. By March 31st, 2023, around 12.5 TWh was sold, while the remaining volumes will remain in the Rehden, Katharina and Wolfersberg storage facilities. THE has already booked capacity of 35 TWh at these facilities²²³. The booked capacity corresponds to around 14% of the overall working volume in the German storage facilities.

According to the neutrality account information published by THE, the cost for procuring gas in 2022 amounted to 8.7 bil. €, corresponding to a unit cost of around 174 €/MWh.

National measures in place prior to the Gas Storage Regulation

No measures aiming to enhance filling of gas storage facilities were in place in Germany prior to 2022.

Key takeaways

- The underground storage facilities in Germany have a working volume of 245 TWh, the largest in the EU. However, this capacity corresponds to below 30% of its annual gas demand.
- Germany has succeeded in meeting the filling trajectories and targets, set in the Gas Storage Regulation and the targets in the national legislation. On November 1st, 2022, the filling level was 99%. The measures implemented in 2022 appear to have led to high filling levels that were observed in 2019 and 2020.
- The market area manager, Trading Hub Europe (THE), is responsible for ensuring that the national filling level obligations are achieved. The measures that can be undertaken by THE include tenders for strategic storage-based options (SSBO products) and own purchases of gas and injection in storage facilities. Decisions of THE to carry out such measures are approved by BMWK and BNetzA.
- SSBO products are procured in public and non-discriminatory tenders. The providers of SSBO products undertake to:
 - Ensure that specific percentages of the contractually agreed gas quantities are stored at a defined storage facility at specific dates, and
 - Maintain 20% of the contractually agreed gas quantities at the storage facility, to be available for THE to call-off at any time (i.e., in the form of strategic gas stocks).
- Costs incurred by THE for procuring SSBO products and purchasing and storing gas quantities are recovered through a tariff (neutrality charge), which also takes into account THE's revenues from the security of supply activities. The charge is allocated to balancing groups proportionately to their physical withdraws at exit points connecting users with standard load profiles or metered load profiles and at cross-border IPs/VIPs.
- In case capacity constraints at storage facilities do not allow THE to perform its security of supply activities, the respective SSOs must release to THE capacity booked but not used by

²²² Source: THE Press Release: "THE informs about storage activities", April 3rd, 2023 ([Link](#)).

²²³ Source: THE Press Release: "Contracted storage capacities for storage year 2023/2024", February 6th, 2023 ([Link](#)).

storage users. In this case, the storage user continues to pay the SSO for the capacity except for variable injection and withdrawal fees.

- Monitoring of the measures' implementation is carried out by BMWK, with BNetzA. The SSOs are responsible for reporting on the compliance with the filling trajectories and targets.
- THE publishes information related to its security of supply activities, including results of the tenders for SSBO products (quantities and costs), procurement of its own gas quantities, monthly evolution of costs and revenues. However, the basis on which THE proceeds with securing gas quantities, via SSBOs or own purchases, is not published.
- In 2022 THE secured as gas options 84 TWh, 20% of which remained in storage as strategic stocks (16.8 TWh), at a cost of 852 mil. €. No call-off quantities were released by THE in 2022 or 2022. THE also procured and stored in 2022 50 TWh, at a cost of 8.7 bil. €. Around 25% of these quantities were sold by THE, while the rest will remain stored for the next winter season.
- Market participants have expressed concerns on the fact that -to a large extent- THE resorted to buying its own gas quantities (37% of gas quantities secured) at very high prices, although this is considered as a measure of last resort. This has a significant impact on the neutrality charge imposed by THE and may result in price distortions when THE sells this gas in the market.

Hungary

Overview

Gas storage infrastructure (August 1 st , 2023)	
Aggregate GWV	67.9 TWh
Injection capacity	488.8 GWh/d
Withdrawal capacity	801.8 GWh/d

Storage filling targets of Gas Storage Regulation and actual gas in storage					
2022			2023		
	Target	Actual		Target	Actual
1 August	45%	55%	1 February	51%	59%
1 September	60%	66%	1 May	37%	47%
1 October	70%	76%	1 July	65%	71%
1 November	80%	88%	1 September	86%	90%
			1 November	90%	N/A

Measures applied in the MS for gas storage			
a) Minimum volume in gas storage	✓*	f) Financial incentives for market participants	
b) Tender of capacities		g) Unused booked capacities	
c1) Balancing stock managed by TSO		h) Strategic storage	✓
c2) Obligations imposed on designated entities		i) Appointment of dedicated entity	
d) Coordinated instruments		j) Discounts on storage tariffs	
e) Voluntary joint procurement mechanisms		k) Capital and operational expenditures	
Other			

* Measure in place prior to the Gas Storage Regulation and not amended in 2022

Applicable legal and regulatory framework

Before 2022, Hungary already had in place provisions in its regulatory framework, concerning the role of underground storage facilities in enhancing security of supply:

- Article §30.(2) of the Government Regulation 19/2009. (I.30.) on the implementation of Act XL of 2008 on the Gas Supply²²⁴.
- Act XXVI of 2006 on the strategic stockpiling of natural gas²²⁵.

²²⁴ [Link](#) to the Government Regulation 19/2009.

²²⁵ [Link](#) to the Act XXVI of 2006.

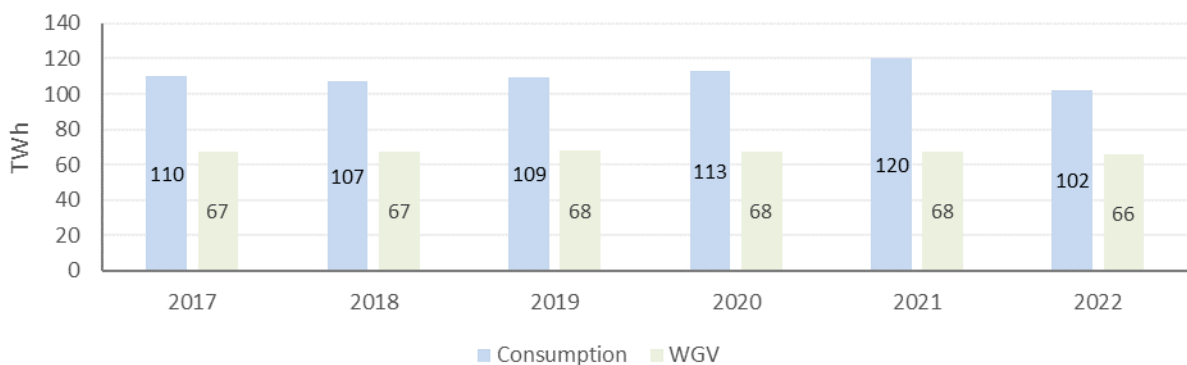
- ITM Regulation 2021/59 (XII.15.) on the level of the natural gas security stocks²²⁶.

In 2022, TIM Regulation 10/2022 (VIII.4.) introduced provisions for special gas stocks and the conditions of their establishment²²⁷.

Gas storage infrastructure

The underground gas storage infrastructure in Hungary has a total gas working volume of 67.9 TWh, withdrawal capacity of 801.8 GWh/d and injection capacity of 488.8 GWh/d²²⁸. Hungary has large storage capacity compared to its annual gas demand, corresponding to an average of around 60% (64% in 2022). Figure 56 shows how the storage capacity compares to the annual consumption for the period 2017 to 2022.

Figure 56: Storage capacity and annual gas consumption from 2017 to 2022²²⁹



Hungary has five underground gas storage facilities, the largest being Zsana with a storage capacity of 22.7 TWh²³⁰. The locations of the country’s UGSs are presented in the map below.

Figure 57: Underground gas storage facilities in Hungary²³¹



²²⁶ [Link](#) to the ITM Regulation 2021/59 (XII.15.).

²²⁷ [Link](#) to the TIM Regulation 10/2022 (VIII.4.).

²²⁸ Source: HGS, HEXUMS (August 1st, 2023).

²²⁹ Sources: HGS, HEXUMS, Eurostat.

²³⁰ Source: HGS <https://mfgt.hu/en/Tevekenysegunk/Gaztarolok>.

²³¹ Source: GIE Storage Map.

Storage facilities in Hungary are operated by HGS and HEXUM. The technical characteristics of the storage facilities of each SSO are presented in Table 80.

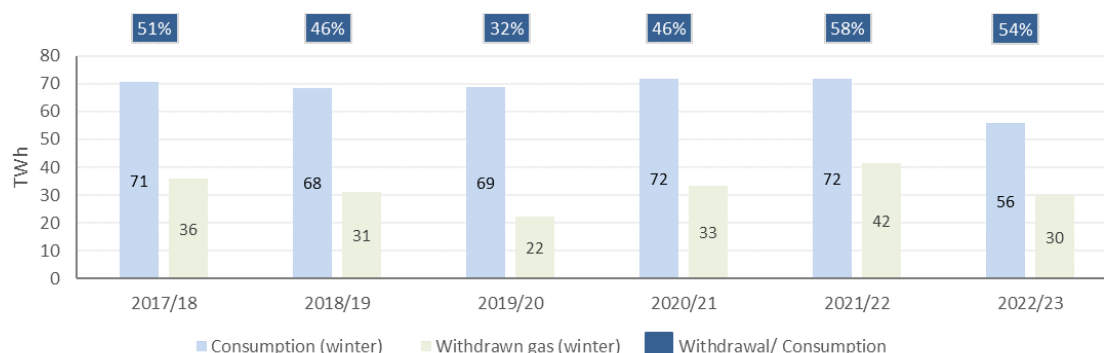
Table 80: Gas storage operators and infrastructure

Name	GWV (TWh)	Injection (GWh/d)	Withdrawal (GWh/d)
HGS	47.84	354.72	537.9
<i>Zsana</i>	23.44	183.62	302.43
<i>Hajdúszoboszló</i>	17.71	111.25	172.82
<i>Pusztaderics</i>	3.67	31.32	31.32
<i>Kardoskút</i>	3.02	28.52	31.32
HEXUM (UGS Szöreg-1)	20.11	134.06	263.9

Gas storage operation and filling targets

Between 2017 and 2022, gas withdrawals from the Hungarian storage facilities in the winter period (November of one year to March of the next) corresponded to a share of gas demand that ranged significantly, namely from 32% to 58% (Figure 58).

Figure 58: Use of gas storage to cover demand in the winter season²³²



The filling targets and trajectories for Hungary in 2022 and 2023, as established in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301, are presented in the Table below. No national targets have been set, different from those in the Gas Storage Regulation.

Table 81: Targets and trajectories for Hungary in 2022 and 2023²³³

2022	1 August	1 September	1 October	1 November	
	45%	60%	70%	80%	
2023	1 February	1 May	1 July	1 September	1 November
	51%	37%	65%	86%	90%

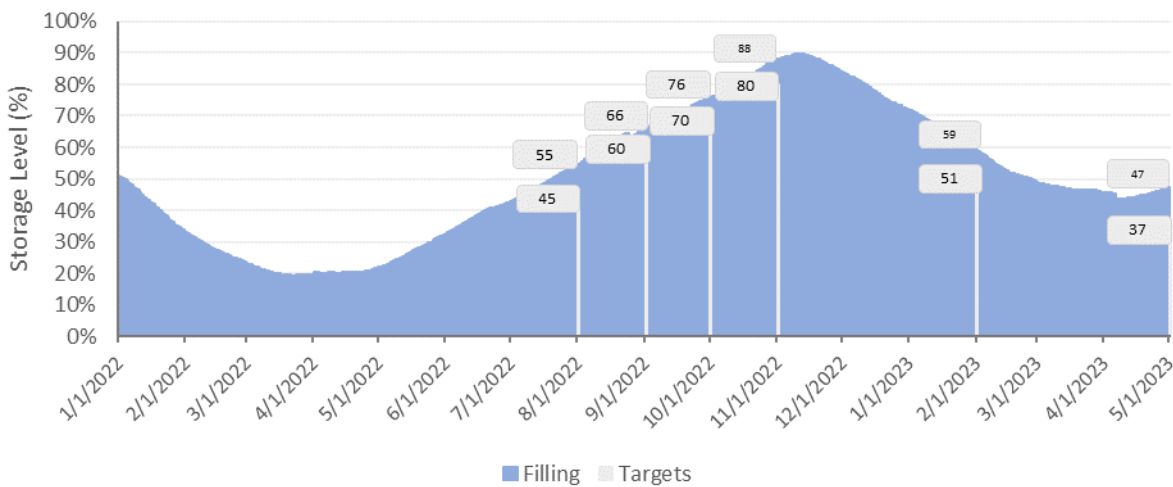
²³² Source: HGS, HEXUM, Eurostat.

²³³ Filling trajectories and targets as stated in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301.

Hungary satisfies the conditions laid down in Article 6a(2) of the Gas Storage Regulation, due to the fact that the capacity of the underground storage facilities in Hungary²³⁴ as a share of the average annual gas consumption over the preceding five years (2017 – 2021) amounts to 59%, and thus is higher than the 35% threshold of the Regulation. Although Hungary applies the 35% rule, the country still complies with the targets as laid out in the Gas storage Regulation and the Implementing Regulation.

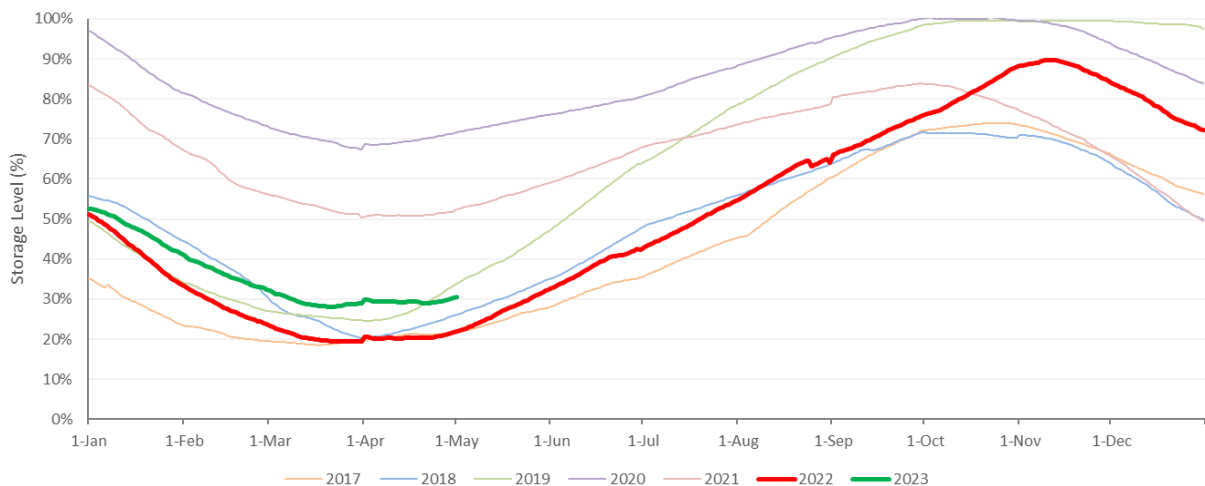
Hungary has succeeded in meeting and even exceeding the EC Gas Regulation storage filling trajectories and targets for 2022 and 2023 (so far), as shown in Figure 59. On November 1st, 2022, the filling level reached 88%.

Figure 59: Daily gas in storage vs filling targets in 2022 and 2023²³⁵



The storage filling levels in 2022/23 remained lower compared to those observed in 2019 and 2020, even during the winter period (Figure 60).

Figure 60: Comparison of daily gas filling trends between 2017 and 2023²³⁶



²³⁴ As of November 1st, 2022.

²³⁵ Source: HGS, HEXUM.

²³⁶ Source: HGS, HEXUM.

The charges for injection and withdrawal offered by HGS²³⁷ have increased considerably, showing a 75% increase in 2022 compared to the 2021 levels (Table 82).

Table 82: Evolution of withdrawal and injection fee²³⁸

Fee	2019	2020	2021	2022
Withdrawal (€/MWh)	0.041	0.035	0.028	0.049
Injection (€/MWh)	0.281	0.288	0.256	0.448

Overview of national measures

Hungary already had in place two measures involving storage facilities for security of supply purposes, prior to the entry into force of the Gas Storage Regulation:

- a storage obligation was in place requiring universal service providers²³⁹ to store an amount of gas, determined by MEKH, by October 1st of each year in underground storage facilities.
- A dedicated entity, the Hungarian Hydrocarbon Stockpiling Association (HUSA), was tasked with establishing and maintaining natural gas security stocks.

In July 2022, after the entry into force of the Gas Storage Regulation, the Hungarian Government with TIM Regulation 10/2022 (VIII.4.) decided on the creation of an additional, special natural gas reserve (approximately 750 mcm). The creation of these stocks was also entrusted to the HUSA.

The mechanism outlined above combines two measures from the list of Article 6b(1) of the Gas Storage Regulation:

Measure	Implementation	Relevance to Article 6b(1) measures
Universal gas suppliers are obligated to maintain security stocks.	Prior to 2022	Requiring gas suppliers to store minimum volumes of gas in storage facilities, including in underground gas storage facilities and/or in LNG storage facilities, those volumes to be determined on the basis of the amount of gas supplied by gas suppliers to protected customers (point a).
The HUSA is entrusted with maintaining the natural gas security stocks and the special natural stocks.	Amended in 2022	Adopting effective instruments for the purchase and management of strategic storage by public or private entities (point h).

These measures are analysed in detail below.

It should be noted that the default capacity allocation mechanism is auctions. Since the relevant regulations were not amended with a view to facilitating achievement of the storage filling targets,

²³⁷ Source: HGS website: Service and fees ([Link](#)).

²³⁸ Values converted to Euro with an exchange rate of 379.5 HUF/EUR (Source: ECB on 11/7/2023).

²³⁹ Universal service providers are suppliers supplying gas at regulated prices and under regulated conditions to households and microenterprises.

this mechanism is not analysed further in this Study, although it corresponds to point (b) of Article 6b(1) of the Gas Storage Regulation.

Furthermore, the revenues required for the capital and operational expenditures of the underground storage facilities in Hungary are recovered through regulated storage tariffs (with a profit cap). This cost recovery mechanism has been in place for several years, and, although it corresponds to point (k) of Article 6b(1) of the Gas Storage Regulation, it is not related to measures for enhancing security of supply, and thus is not analysed further in this Study.

National measures implemented due to the Gas Storage Regulation

Strategic storage (point (h) of Article 6b(1))

Implementation of the measure

Act No. XXVI of 2006 assigned to the Hungarian Hydrocarbon Stockpiling Association (HUSA) the responsibility of safeguarding natural gas stocks. There are two distinct reserves of gas to be maintained, the security stocks and the special gas reserve. HUSA began maintaining the special gas reserves in August 2022, in order to ensure filling of the storage facilities. The volumes to be stockpiled by the stockpiling entity are determined by the Minister responsible for Energy Affairs. TIM Regulation 2021/59 (XII.15.), determines the quantities for security stocks and TIM Regulation 10/2022. (VIII. 4.) the special gas reserve:

- The natural gas security stocks amounted to 9.5 TWh in 2021 and 12.7 TWh in 2022.
- The additional, special natural gas reserve amounted to 7.1 TWh in 2022.

The HUSA may sell or otherwise use the stocks and replenish the amount required to reach the specified stock level.

In case that the HUSA fails to fulfil its stockpiling obligations the standard penalties for noncompliance with the legal regulatory framework apply (§. 119 (1) of Act XL of 2008 on the Gas Supply).

Recovery of costs associated with implementation of the measure

A security stockpiling fee, determined by HUSA, is paid by all gas end-consumers, excluding household consumers. Gas suppliers / traders collect the fee from their final customers and submit the funds to HUSA. Large consumers directly buying gas in the organized market or directly importing gas pay the respective fee to HUSA themselves. The stockpiling fee is allocated to the final consumers on the basis of their gas consumption. The fee covers the costs associated with the establishment and storage of reserves. MEKH is not required to approve the fee.

In 2023 the stockpiling fee for the security stocks increased almost 4 times compared to 2022, while the fee for the special stocks was introduced in the beginning of October 2022²⁴⁰:

Stockpiling fee	From 1/7/2022	From 1/10/2022	From 1/1/2023	From 1/4/2023
Security stocks	0.47	0.47	1.23	1.79
Special stocks	-	1.89	1.96	1.40

For the purchase of the special stocks, HUSA was allowed to borrow a maximum of 2,012 mil. €.

²⁴⁰ [Link](#) to stockpiling fee.

Monitoring and transparency

The operation of the HUSA is monitored by an Oversight Committee which consists of representatives of the Government, the MEKH and hydrocarbon companies.

HUSA regularly publishes the actual level of stocks that it maintains²⁴¹.

Effects on the gas market

As the stockpiling obligation has been in effect for more than a decade, it had no significant new effects on the gas market. However, the fact that the stocks to be maintained had to be extended, due to the introduction of special stocks in 2022, the stockpiling fee increased, which in turn increased the affected end-user energy costs.

Difficulties and risks with the implementation of the measure

No difficulties or risks with the implementation of the measure were reported.

Application of the measure in 2022/23

The security stocks and the additional special stocks for 2022 amounted to 12.7 TWh and 7.1 TWh, respectively, as defined in TIM Regulation 2021/59 and TIM Regulation 10/2022 respectively. No changes to the stocks is foreseen in 2023.

National measures in place prior to the Gas Storage Regulation

Minimum volume in gas storage (point (a) of Article 6b(1))

Implementation of the measure

In Hungary, the universal supply providers (suppliers selling gas at regulated prices and under regulated conditions to households and microenterprises), are required to store gas before the start of the winter period. After the start of the winter period, the universal providers may withdraw gas from storage without restrictions. The volumes are determined by MEKH, taking into account the winter peak consumption of the last 120 months.

This measure has been in effect for more than a decade. The obligation for MVM Next Ltd. (currently the sole universal supplier) is 19.8 TWh for both the winter of 2022/2023 and the winter of 2023/2024.

The measure to store gas is a legal obligation, so the standard penalties for noncompliance with the legal regulatory framework apply (§. 119 (1) of Act XL of 2008 on the Gas Supply).

Recovery of costs associated with implementation of the measure

The mechanism through which the universal gas supplier is being compensated for implementing the measure is by including the cost of storage use to the end-users' (households and micro-enterprises) regulated tariff (as it does for all other system use costs).

Monitoring and transparency

MEKH is responsible for monitoring the implementation of the measure. According to the Government Regulation 19/2009, the universal service provider is obligated to present to MEKH, the following:

²⁴¹ Source: HUSA ([Link](#)).

- Storage capacities until March 31st
- The extent of the stored stock until October 1st

The supplier's obligation is published on MEKH's website by March 1st, of each year, together with the justification for its calculation²⁴².

Effects on the gas market

Since this measure has been in place for a decade, no new effects on the gas market were reported.

Difficulties and risks with the implementation of the measure

This measure was in place even before the gas crisis as a default measure to ensure the winter supply of households. As a result, no unexpected new challenges were observed.

Application of the measure in 2022/23

The storage obligation for 2022 was 19.8 TWh, while the aggregate target was at 38.28 TWh. The same amount of 19.8 TWh will be maintained by the single universal operator for November 1st, 2023.

Key takeaways

- The underground storage facilities in Hungary have a working volume of 67.9 TWh, corresponding to approx. 60% of the country's annual gas consumption (64% in 2022).
- Even though Hungary applies the 35% rule, the country still succeeded so far in meeting the filling trajectories and targets, set in the Gas Storage Regulation. On November 1st, 2022, the filling level reached 88%.
- Hungary is implementing a new measure and an old measure to enhance security of supply:
 - The Hungarian Hydrocarbon Stockpiling Association is responsible for establishing and maintaining two distinct reserves of gas: the natural gas security stocks and the special natural gas stocks. In 2022, the security stocks amounted to 12.7 TWh and the special stocks to 7.1 TWh. The implementation of this measure is monitored by the Oversight Committee which consists of representatives of the Government, the MEKH and hydrocarbon companies.
 - The universal supply provider (MVM Next Ltd. - supplier selling gas at regulated prices and under regulated conditions to households and microenterprises), is required to store gas before the start of the winter period. The volumes are determined by MEKH, based on the winter peak consumption of the last 120 months. For both winter of 2022/2023 and the winter of 2023/2024, the obligation for MVM Next Ltd is set at 19.8 TWh. This measure has been in effect for more than a decade and MEKH is responsible for monitoring its implementation.

²⁴² The amount of natural gas to be stored in 2023-2024 ([Link](#)).

Italy

Overview

Gas storage infrastructure (August 1 st , 2023)	
Aggregate GWV	195.2 TWh
Injection capacity	1,698.4 GWh/d
Withdrawal capacity	2,914.2 GWh/d

Storage filling targets of Gas Storage Regulation and actual gas in storage					
2022			2023		
	Target	Actual		Target	Actual
1 August	58%	73%	1 February	45%	71%
1 September	66%	83%	1 May	36%	66%
1 October	73%	91%	1 July	54%	82%
1 November	80%	95%	1 September	72%	94%
			1 November	90%	N/A

Measures applied in the MS for gas storage			
a) Minimum volume in gas storage		f) Financial incentives for market participants	✓
b) Tender of capacities	✓*	g) Unused booked capacities	✓*
c1) Balancing stock managed by TSO	✓	h) Strategic storage	✓*
c2) Obligations imposed on designated entities	✓	i) Appointment of dedicated entity	✓
d) Coordinated instruments		j) Discounts on storage tariffs	
e) Voluntary joint procurement mechanisms		k) Capital and operational expenditures ²⁴³	✓*
Other			

* Measure in place prior to the Gas Storage Regulation and not amended in 2022

Applicable legal and regulatory framework

In 2022, changes in the Italian regulatory framework introduced new measures related to the operation of gas underground storage facilities, to enhance security of supply, the most important of which include:

- Decree-Law n. 17 of March 1st, 2022²⁴⁴, that among other provisions sets a national filling target for underground storage facilities.

²⁴³ The SSOs recover their capital and operational expenses through the charges for the use of storage. This is not examined as a separate measure but is already covered as part of the other measures analysed for Italy.

²⁴⁴ [Link](#) to Decree-Law 1 March 2022.

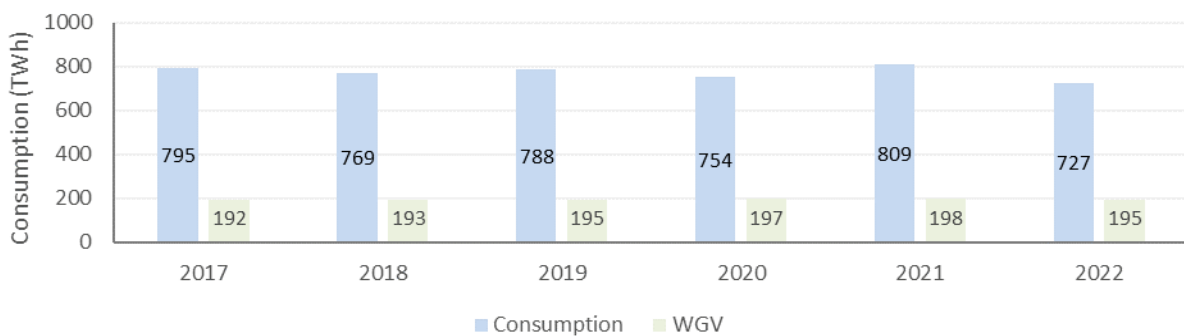
- Ministerial Decree n. 138 of April 1st, 2022²⁴⁵ by the Ministry of the Environment and Energy Security (MASE), relating to the modalities of storages for the period 2022 – 2023.
- Ministerial Decree MASE n. 253 of June 22nd, 2022²⁴⁶, that includes provisions regarding the safety of the national gas system.
- Decree-Law n. 50 of May 17th, 2022²⁴⁷ and Ministerial Decree MASE n. 287 of July 20th, 2022²⁴⁸, that assigns to Gestore dei Servizi Energetici (GSE) storage filling of last resort obligations.
- The Autorità di Regolazione per Energia Reti e Ambiente (ARERA) issued a number of regulations relevant to the operation of gas storages, notably:
 - Resolution 110/2022/R/gas²⁴⁹ of March 15th, 2022
 - Resolution 165/2022/R/gas²⁵⁰ of April 8th, 2022
 - Resolution 189/2022/R/gas²⁵¹ of April 27th, 2022
 - Resolution 274/2022/R/gas²⁵² of July 24th, 2022

Storage related security of supply measures were in place in Italy many years before 2022 and the EC Gas Storage Regulation. Specifically, Decree-Law n. 164 of May 23rd, 2000²⁵³ that implemented Directive 98/30/EC included provisions assigning strategic storage obligations to SSOs.

Gas storage infrastructure

The underground gas storage infrastructure in Italy has a total gas working volume of 195.2 TWh, withdrawal capacity of 2,914 GWh/d and injection capacity of 1,698 GWh/d²⁵⁴. Italy’s storage capacity corresponds to around 25% of the country’s annual gas consumption. Figure 61 shows how the storage capacity compares to the annual consumption for the period 2017 to 2022.

Figure 61: Storage capacity and annual gas consumption from 2017 to 2022²⁵⁵



²⁴⁵ [Link](#) to Ministerial Decree 1 April 2022.

²⁴⁶ [Link](#) to Ministerial Decree 22 June 2022.

²⁴⁷ [Link](#) to Decree-Law 17 May 2022.

²⁴⁸ [Link](#) to Ministerial Decree 20 July 2022.

²⁴⁹ [Link](#) to Resolution 110/2022/R/gas.

²⁵⁰ [Link](#) to Resolution 165/2022/R/gas.

²⁵¹ [Link](#) to Resolution 189/2022/R/gas.

²⁵² [Link](#) to Resolution 274/2022/R/gas.

²⁵³ [Link](#) to Decree-Law 23 May 2000.

²⁵⁴ GIE (August 1st, 2023).

²⁵⁵ Sources: GIE, Eurostat.

Italy has a total of 13 underground gas storage facilities. 10 facilities are coupled under Stogit virtual gas storages (VGSs), 3 facilities are coupled under Edison VGS and 1 belongs to IGS. The locations of the country's storage facilities are presented in the map below.

Figure 62: Underground gas storage facilities in Italy²⁵⁶



Storage facilities in Italy are operated by Edison Stoccaggio, IGS and Stogit. The technical characteristics of the storage facilities of each SSO are presented in Table 83.

Table 83: Gas storage operators and infrastructure²⁴⁴

Name	GWV (TWh)	Injection (GWh/d)	Withdrawal (GWh/d)
Edison Stoccaggio	11.0	79.0	95.53
VGS Edison Stoccaggio (Collalto, Cellino, San Potito & Cotignola)	11.0	79.0	95.53
IGS	2.48	17.82	35.65
UGS Cornegliano	2.48	17.82	35.65
Stogit	181.71	1601.63	2783.07
VGS Stogit (Fiume Treste, Bordolano, Sabbioncello, Minerbio, Sergnano, Ripalta, Cortemaggiore, Brugherio, Settala)	181.71	1601.63	2783.07

In addition to the underground gas storage facilities, Italy can also store gas at its LNG facilities, with aggregate storage capacity of 616,590 m³ LNG, as shown in the Table below.

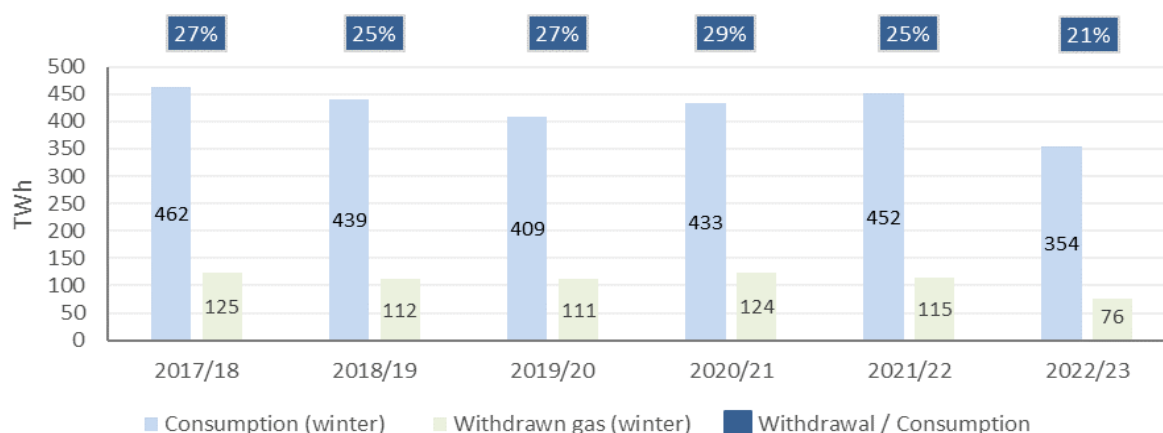
²⁵⁶ Source: GIE Storage Map.

Table 84: Storage capacity at LNG facilities²⁵⁷

Storage Facilities	Storage Capacity (m ³ LNG)
Panigaglia LNG Terminal	75,000
FSRU OLT Offshore LNG Toscana	137,160
Rovigo LNG Terminal	250,000
Piombino FSRU	154,430

Gas storage operation and filling targets

Withdrawals of gas from the Italian underground storage facilities during the winter period (November of one year to March of the next) over the past 5 years correspond to around 20% - 30% of the overall gas consumption in the market (Figure 63).

Figure 63: Use of gas storage to cover demand in the winter season²⁵⁸

The filling targets and trajectories for Italy in 2022 and 2023, as established in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301, are presented in the Table below. The Decree-Law n. 17 of March 1st, 2022, set stricter national targets for Italy, foreseeing a filling level target of 90% starting from the storage year 2022/23.

Table 85: Targets and trajectories for Italy in 2022 and 2023²⁵⁹

2022	1 August	1 September	1 October	1 November	
	58%	66%	73%	80%	
2023	1 February	1 May	1 July	1 September	1 November
	45%	36%	54%	72%	90%

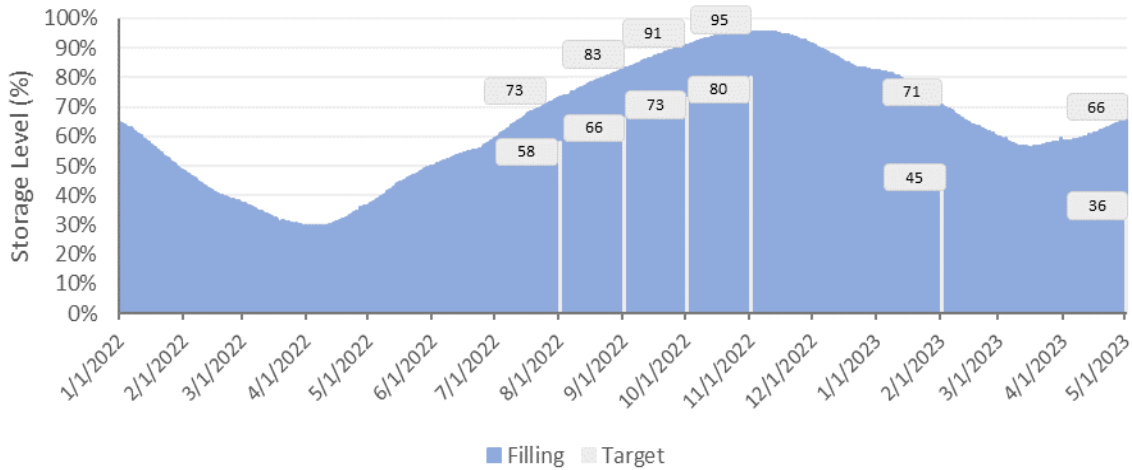
²⁵⁷ Source: GIE.

²⁵⁸ Source: GIE (for withdrawal) and Eurostat (for consumption).

²⁵⁹ Filling trajectories and targets as stated in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301.

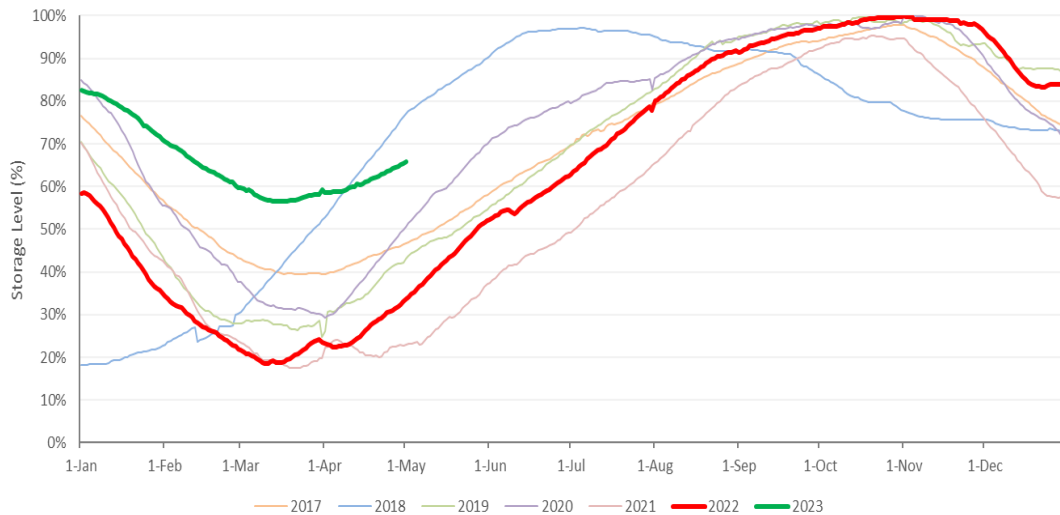
Italy has succeeded in meeting the EC Gas Regulation storage filling trajectories and targets for 2022 and 2023 so far, as shown in Figure 64. The 90% national target was also met on November 1st, 2022, as the filling level on that day was 95%.

Figure 64: Daily gas in storage vs filling targets in 2022 and 2023²⁶⁰



The storage filling trend at the Italian storage facilities was similar to most storage cycles over the past 5 years. The filling levels in the beginning of 2023, however, have been considerably higher than the corresponding periods of the previous years and especially for 2019 to 2021 (Figure 65). Overall, measures implemented in 2022 allowed gas stocks to return filling levels similar to those observed pre-2021 during the withdrawal period, while the stocks in the beginning of 2023 remained higher in comparison to the past 5 years.

Figure 65: Comparison of daily gas filling trends between 2017 until 2023²⁶¹



Stogit storage tariffs have remained almost at the same level for the past 5 years, decreasing slightly in 2023 compared to the previous years, as shown in the Table below.

²⁶⁰ Source: GIE.

²⁶¹ Source: GIE.

Table 86: Evolution of tariffs²⁶²

Type of Fee	2018	2019	2020	2021	2022	2023
Storage (c€/KWh/year)	0.1008	0.0994	0.0977	0.0993	0.1005	0,0908
Injection (c€/KWh/day/year)	7.1996	7.0462	6.9234	6.8573	6.9357	6,2767
Withdrawal (c€/KWh/day/year)	9.1678	9.0963	9.5999	9.6844	9.7826	8,8404

Overview of national measures

Italy already had in place storage related security of supply measures since early 2000s', with SSOs being tasked with establishing and maintaining strategic storage reserves. This obligation has remained unchanged in 2022 and contributed to the storage filling target.

In 2022, additional measures were introduced, to increase the storage filling levels and ensure that the targets are achieved (most of which were temporary applying only for the 2022/23 winter season):

- Increase of the frequency of auctions for monthly storage injection capacity (once per week) from April 1st to October 31st, 2022.
- For the storage year 2022/23, offering of capacity for modulation services at zero reserve price in the auctions. Additionally costs for technical operation of compression and treatment facilities not charged to storage users.
- Assignment of the obligation of filling of last resort to Snam (as balancing manager) and Gestore dei Servizi Energetici (GSE) until the end of 2022.
- Procurement by Snam and injection in storage of gas volumes for the operation of the transmission system and the storage facilities for 2022.
- Establishment of contracts for differences for storage users in 2022.
- Provision of a stock premium to storage users, to increase their filling level in 2022.
- Application of penalty to storage users that hold gas stocks below the minimum level assigned to them by the SSO.

The mechanism outlined above combines a number of measures from the list of Article 6b(1) of the Gas Storage Regulation:

Measure	Implementation	Relevance to Article 6b(1) measures
The number of auctions for monthly storage capacity products increased. Additionally, reserve price for auctions is set to zero and part of SSOs operational costs are not charged to storage users.	Thermal year 2022 – 2023 ²⁶³	Requiring storage system operators to tender their capacities to market participants (point b).

²⁶² Snam Storage Tariffs ([Link](#)).

²⁶³ A thermal year extends from April 1st of a year to March 31st of the next one.

Procurement of gas by Snam and injection in storage for operation of transmission and storage.	Thermal year 2022 – 2023	Requiring transmission system operators or entities designated by the Member State to purchase and manage balancing stock exclusively for carrying out their functions as transmission system operators (point c1).
Snam and GSE have undertaken to provide filling of last resort in case the filling targets cannot be met ²⁶⁴ .	Temporary measure only in 2022	Imposing an obligation on other designated entities for the purpose of safeguarding the security of gas supply in the case of an emergency (point c2).
Establishment of contracts for differences Provision of a stock premium to storage users. Penalty to storage users for stocks below the level assigned by SSO.	Thermal year 2022 – 2023	Providing financial incentives for market participants, including for storage system operators, such as contracts for difference, or providing compensation to market participants for the shortfall in revenues or for costs incurred by them as a result of obligations on market participants, including storage system operators which cannot be covered by revenue (point f).
SSOs have been tasked with establishing and maintaining strategic storage reserves.	Prior to 2022	Adopting effective instruments for the purchase and management of strategic storage by public or private entities (point h).

These measures are analysed in detail below.

A use-it-or-lose-it mechanism for storage capacity was established in 2019, with ARERA's Resolution 67/2019/R/gas, as an anti-hoarding mechanism, without any changes to it to increase storage filling, in line with the Gas Storage Regulation requirements. As a result, although this measure corresponds to point (g) of Article 6b(1) it is not analysed further in this Study.

The revenues required for the capital and operational expenditures of the underground storage facilities in Italy are socialized through transmission tariffs, only to the final customers in the country (no costs are allocated to cross-border points)²⁶⁵. This cost recovery mechanism has been in place for many years, and, although it corresponds to point (k) of Article 6b(1) of the Gas Storage Regulation, it is not related to measures for enhancing security of supply, and thus is not analysed further in this Study.

²⁶⁴ This measure could also fall under the measure appointing a dedicated entity with meeting the filling targets (point i).

²⁶⁵ The approved tariffs for storage are published by ARERA in this [Link](#).

National measures implemented due to the Gas Storage Regulation

Tender of capacities (point b of Article 6b)

Implementation of the measure

Allocation of storage capacity has been carried out with auctions for several years. ARERA's Resolution 67/2019/R/gas²⁶⁶ (RAST) determined the modalities for the storage services and the mechanism through which the SSOs allocate capacity.

STOGIT offers capacity at the PRISMA booking platform, whereas Edison Stoccaggio and IGS make their capacity available through their own platforms. The capacity products offered include seasonal and monthly products with different types of services offered (peak, flat and fast cycle modulation services, and multi-annual service). Products for short-term services (monthly, weekly, daily, intraday) are being offered as well.

The auction algorithm applied is the "offer price"²⁶⁷, with the exception of the seasonal peak modulation service, which is offered with a "uniform price"²⁶⁸ auction procedure. For short-term capacity products, the uniform price algorithm is applied.

To facilitate contracting of storage capacity, Ministerial Decree n. 138 of April 1st, 2022, increased the frequency of the auctions carried out for products with monthly injection. According to this decree, auctions for such products had to be carried out on a weekly basis from April 1st to October 31st, 2022. This measure was temporary and did not continue in 2023.

Resolution 110/2022/R/gas introduced additional incentives to storage users for utilizing their capacity. A zero-reserve price was set at the auctions for modulation storage services. Furthermore, the SSOs should not charge to storage users the costs associated with the technical consumption of the compression and treatment plants. This was a temporary measure²⁶⁹, applied only for the thermal year 2022-2023, to facilitate storage filling in 2022, when summer-winter spreads were negative.

Recovery of costs associated with implementation of the measure

Capacity is offered at the auctions at a reserve price, in line with the summer-winter spread. Compensation of the SSOs for offering capacity via auctions is carried out in accordance with the regulated regime for storages, i.e., the maximum allowed revenue charged to final customers through the transmission tariffs (no costs are allocated at cross-border points).

No changes were made in the existing storage tariff regime to provide additional compensation for the one-off measures implemented. The SSOs will recover any revenue losses due to the offering of capacity at zero reserve price and not charging part of the operational costs through the existing reconciliation mechanism.

Monitoring and transparency

Auctions are being carried out in accordance with the rules set by ARERA in its Resolutions. The Ministry is responsible for monitoring the results of the auctions, as well as the weekly trends of

²⁶⁶ [Link](#) to Resolution 67/2019/R/gas.

²⁶⁷ Details on the offer price auction algorithm can be found [here](#).

²⁶⁸ Details on the uniform price auction algorithm can be found [here](#).

²⁶⁹ ARERA does not consider this measure as discounts to storage tariffs, as this was a temporary measure put in place to facilitate storage filling in a period of negative spreads, while the clearing price that storage users would pay could be higher than zero.

storage filling, based on information that is provided by the SSOs (this monitoring requirement was introduced in 2022²⁷⁰).

Effects on the gas market

No impact of the measure on the gas market has been reported (auctions have been used as the mechanism to allocate capacity for several years).

Difficulties and risks with the implementation of the measure

No difficulties or risks with the implementation of the measure were reported (auctions have been used as the mechanism to allocate capacity for several years).

Application of the measure in 2022/23

As the auctions are the only allocation mechanism for storage capacity in the market, all booked storage capacity, except that reserved by the SSOs for the strategic storage service, was allocated via tendering.

As capacity booking cannot by itself ensure storage filling, it is not possible to determine quantitatively the contribution of increasing the frequency of monthly auctions before the winter period to the achievement of the filling target.

Furthermore, the impact of the incentives related to storage charges (zero reserve price at auctions, not charging part of SSOs' operational costs) of the filling levels cannot be isolated, as capacity booking at the auctions and its subsequent utilization by the storage users depends on multiple factors.

Balancing stock managed by TSO (point c1 of Article 6b)

Implementation of the measure

To increase the filling level, Ministerial Decree n. 138 of April 1st requires Snam (as the major transmission system operator) to procure and inject in the storages gas volumes for:

- the operation of the transmission system (unaccounted for gas, consumption, losses and "delta in-out" of the distribution companies) for the period November 2022 – March 2023, and
- the management of the technical consumption of the SSOs for the thermal year 2022 – 2023.

The quantities to be procured corresponding to the transmission system operation are based on the needs recorded during for the months January, February, March, November, and December of 2021. The quantities required by the SSOs to operate their facilities are defined directly by the corresponding SSO.

The obligations of Snam for procuring and storing operational gas are detailed in ARERA's Resolution 165/2022/R/gas. Snam must procure the necessary volumes at the AGS segment (segment for the supply of system gas) of Gestore dei Mercati Energetici (GME). The price is determined in an auction at marginal price. For procurement of gas, the maximum price is offered by the TSO is the average price of the transactions recorded on the offer day in the continuous trading market, for the delivery day, and increased by 7 €/MWh for the quantities procured for the storage facilities.

Snam must book capacity at the SSOs' auctions, together with the market participants. To facilitate injection of the procured volumes, Snam has the right to procure short-term storage services.

²⁷⁰ Articles 1(7) and 4(5) of the Ministerial Decree relating to storage capacity for the period 2022 – 2023 ([Link](#)).

The measure was temporary and applied only in 2022.

Recovery of costs associated with implementation of the measure

The costs incurred by Snam to procure gas and book capacity at the storages are covered as part of the neutrality mechanism for the balancing of the transmission system²⁷¹, which is paid to the TSO by the Cassa per i Servizi Energetici e Ambientali (Cassa). Snam has the right to request compensation for the financing costs actually incurred in relation to the procurement of gas, up to the limit of the debt ratio foreseen in its WACC parameters.

Monitoring and transparency

Monitoring of this measure is carried out by ARERA, as part of the overall monitoring of the TSO's obligations and activities.

Snam published in its website information regarding the purchases of gas to implement this measure, while the costs were reported in the company's half year report for 2022.

Effects on the gas market

No impact of the measure on the gas market has been reported.

Difficulties and risks with the implementation of the measure

No difficulties or risks with the implementation of the measure were reported.

Application of the measure in 2022/23

To implement this measure, Snam procured and stored approx. 0.7 bcm of gas for the operation of the transmission system and technical consumption of the storage facilities.

Obligations imposed on designated entities (point c2 of Article 6b)

Implementation of the measure

In order to ensure that the filling targets are achieved, the Ministry assigned to Snam (in its capacity as the major transmission company) and GSE the task of filling of last resort. With this mechanism, the two entities are assigned with a budget to procure gas and store it in the underground facilities. This obligation was set for Snam and GSE only for 2022.

Snam and GSE did not have obligations to procure specific volumes of gas. Instead, a budget was assigned to them, and the entities were to procure gas at the market up to that amount.

The obligations of Snam for the service of filling of last resort are detailed in ARERA's Resolution 274/2022/R/gas. Snam must procure the necessary volumes at the AGS segment (segment for the supply of system gas) of GME. The price at which Snam procures gas is determined by an auction at marginal price open to all market participants.

Booking of storage capacity by Snam is carried out by participating at the SSOs' auctions, together with the market participants. To facilitate injection of the procured volumes, Snam has the right to procure short-term storage services.

The task of the GSE for the service of filling of last resort is defined in the Ministerial Decree n. 287 of July 20th, 2022, which foresees three possible methods for GSE to procure and store gas:

²⁷¹ The mechanism is defined in ARERA's Resolution 312/2016/R/gas ([Link](#)).

- Signing a service contract between GSE and Snam, so that the latter undertakes to buy gas at the AGS segment of the market and then transfer the stocks to GSE.
- Concluding bilateral agreements with entities in which the State has direct or indirect participation, so that these entities procure additional quantities in addition to the regular ones purchased and increase their stock.
- Procurement of gas quantities by GSE, with gas delivered at PSV and then injected at storage facilities, with GSE acquiring the necessary capacity.

To book capacity at the storage facilities, GSE has to take part in the auctions, together with the market participants.

Recovery of costs associated with implementation of the measure

The mechanisms applied for Snam and GSE to recover their costs, for providing the filling of last resort service, were different.

For Snam, a budget of 3.3 bil. € could be dispersed by the Cassa to the company (initially 2 bil. €, then increased by 0.5 and 0.8 bil. € with additional Resolutions by ARERA). To ensure that Snam is cost neutral from performing its filling of last resort service, the following apply:

- The difference between the purchase price of the stored gas and the selling price, once Snam provides it in the market, must be settled at the Cassa.
- The financing costs actually incurred in relation to the procurement are recognized to Snam, up to the limit of the debt ratio foreseen in its WACC parameters.

For GSE, Decree-Law n. 50 of May 17th, 2022, assigns a zero-interest State loan of 4 bil. €. GSE will repay the loan using the revenues from sales of the procured gas. To ensure cost neutrality of GSE, any unrecovered costs will be recognized by ARERA.

Monitoring and transparency

Monitoring of Snam's obligations for the filling of last resort service is carried out by ARERA and the Ministry. To this end, in 2022 Snam was obligated to submit, within the first week of each month of the injection period a report on the service, including the volumes procured, the relevant costs and the resources from the Cassa that were used. Additionally, Snam informed the Ministry of its actions to procure gas.

The Ministry is also responsible for monitoring GSE's obligations for the filling of last resort service, as GSE was required to inform the Ministry on its schedule for procuring gas.

Effects on the gas market

No impact of the measure on the gas market has been reported.

Difficulties and risks with the implementation of the measure

No difficulties or risks with the implementation of the measure were reported.

Application of the measure in 2022/23

As described above, a budget of 7.3 bil. € (3.3 bil. € for Snam and 4 bil. € for GSE) was assigned. To fulfil its obligation, GSE assigned to Snam the procurement of gas, and also signed bilateral agreements with State companies.

The volumes of gas procured by Snam in 2022 as a last-resort service amounted to approx. 17 TWh²⁷². GSE procured an additional 17.9 TWh, through service contracts with Snam (for 8.73 TWh) and ENI (for 9.25 TWh).²⁷³

Financial incentives for market participants (point f of Article 6b)

Implementation of the measure

Financial incentives were offered to market participants, to increase their filling levels at the underground storage facilities. These incentives were in the form of:

- A “stock premium” (subsidy) that was offered to users of the storage facilities.
- The possibility to conclude contracts for differences, and
- A penalty to storage users in case their stocks are below the minimum level assigned by the respective SSO.

The main provisions concerning the stock premium are included in Resolution 165/2022/R/gas. Storage users having booked seasonal and monthly storage products were eligible to receive the subsidy. The amount received was determined by:

- The gas stocks of the storage user are defined as:
 - For monthly injection products: the minimum between the minimum stocks on November 1st, 2022, and on the end of the month of injection.
 - For seasonal injection products, the stocks on November 1st, 2022, were used.
- The premium provided is set up to a maximum of 5 €/MWh (depending on the summer-winter spread).

The stock premium is paid to the storage users by Snam (in its capacity as balancing manager). The SSOs notify Snam of the stocks of each user, so that Snam can calculate the subsidy to be granted to each user. Snam then communicates the amount to ARERA and the Cassa, so that the latter can pay the corresponding amount to Snam. The payment to the system users was settled in December 2022.

With Resolution 189/2022/R/gas, ARERA provided to storage users that have booked monthly injection capacity in 2022 the possibility to enter into contracts for differences (CfDs) with Snam (in its capacity as balancing manager), which decreased their exposure to high gas prices in Q2 and Q3 of 2022. For capacities booked until June 10th, 2022, users should request signing of CfDs until June 15th, 2022. For capacity booked afterwards, users should request CfDs within 5 days from the capacity booking.

The CfD foresees a compensation to be assigned for each day of the period between November 1st, 2022, and March 31st, 2023 (reference period), either to the storage user, or to Snam, depending on the price differential between an effective price, based on the price paid for gas by the user, and a reference price, that is determined in Resolution 189/2022/R/gas²⁷⁴. The reference price is defined taking into account the day-ahead price at the PSV and excludes the stock premium paid to storage users.

²⁷² Source: ARERA.

²⁷³ Source: GSE Annual Report, 2022.

²⁷⁴ The complete definitions of the terms used in the CfD mechanism, and the methodology for calculating the reference price are defined in Resolution 189/2022/R/gas and its Annex A.

The CfDs are linked with an obligation of the storage user to maintain in storage sufficient gas stocks, for each day of the reference period, taking into account a withdrawal profile that is defined by the corresponding SSO prior to the reference period.

If for a day of the reference period, the difference between the effective price for the storage user, and the reference price is positive, then the user undertakes to pay compensation to Snam. Reversely, if the difference is negative, then Snam pays the user. The compensation to be paid is determined taking into account the price difference, the gas is storage and the withdrawal profile defined by the SSO. Settlement of these amounts is carried out by Snam on a monthly basis.

Furthermore, Resolution 110/2022/R/gas increased a penalty applied to storage users in case their filling levels are low. According to Resolution 67/2019/R/gas, a storage user must pay a fee if at the end of each month during the injection period (April 1st – October 31st) the stocks that the user maintains in storage are lower than a minimum level set by the SSO. Resolution 110/2022/R/gas set this fee at 1.15 €/MWh if a user's stocks at the end of October 2022 were lower than the minimum requirements of the SSO. The measure was temporary and applied only for 2022.

Recovery of costs associated with implementation of the measure

Although Snam pays the stock premium to the storage users, the costs are covered with funds provided by the Cassa. This way Snam is cost neutral for providing this subsidy.

The same also applies to the costs deriving from payments by Snam to storage users that hold CfDs. Snam determines the amounts to be paid, which are then reimbursed by the Cassa.

Monitoring and transparency

ARERA is responsible for monitoring the disbursement of the stock premium to storage users. Snam provides information to ARERA with regards to the amounts to be granted to the users.

No information is published concerning the amounts provided to storage users as stock premium, and the use of CfDs, i.e., the number of users that opted for the measure and amounts provided to them through the mechanism.

Effects on the gas market

No impact of the measure on the gas market has been reported.

Difficulties and risks with the implementation of the measure

The main challenge with setting up financial incentives for storage users concerned the very short period of time available to define an appropriate level of premium to be provided to storage users as stock premium, to establish the formula for the CfD.

Application of the measure in 2022/23

The stock premium had a significant contribution to ensuring that the filling level in the Italian storages reaches the required targets. It is estimated that this measure's contribution corresponds to almost 43% of the volume of gas stored. The importance of this measure is also indicated in the feedback provided by market participants to consultations carried out by ARERA²⁷⁵.

²⁷⁵ Indicatively, feedback from such consultations is provided in the Preamble of Resolution 189/2022/R/gas.

On the other hand, interest for CfDs was very limited in the market, contributing to just 1% of the stored gas volumes. This limited interest can be attributed to the complexity of the CfDs application, in comparison to the stock premium that the storage users received.

National measures in place prior to the Gas Storage Regulation

Strategic storage (point h of Article 6b)

Implementation of the measure

To safeguard security of supply, operators of underground storage facilities in Italy are required to provide a strategic storage service, i.e., maintain strategic reserves in their facilities. This measure was put in place in 2000, with Decree-Law n. 164 of May 23rd, and was not revised in 2022.

The Ministry of the Environment and Energy Security determines, on an annual basis the obligation of each SSO with regards to the strategic storage service. The actual gas stocks were established in the 2000s' and are now maintained by the SSOs in their facilities.

The strategic reserves cannot be used commercially and can only be drawn upon in case of an emergency, following explicit permission by the Ministry. The capacity necessary to maintain the gas stocks in the underground facilities is reserved by the SSOs and is not open for capacity allocation.

Recovery of costs associated with implementation of the measure

The costs of the SSOs to establish and maintain the strategic reserves are included in the operators' allowed revenue.

Monitoring and transparency

Monitoring of the SSOs' stockholding obligations is done by the Ministry.

The strategic storage volumes' obligations of each SSO (both in energy and volumetric units) are published annually by the Ministry, in a relevant statement.

The SSOs publish information on the volumes of the strategic storage that they maintain each year.

Effects on the gas market

The measure has been in place since 2000s' thus no impact on the gas market can be considered.

Difficulties and risks with the implementation of the measure

No difficulties or risks with the implementation of the measure were reported.

Application of the measure in 2022/23

The Ministry has announced that the strategic storage volumes for the storage year 2023 – 2024 will amount to 4.62 bcm (corresponding to 49.3 TWh), out of which 4.48 bcm will be maintained by STOGIT, and 140 mcm by Edison Stoccaggio. The same strategic storage volumes were required for the storage year 2022 – 2023. This corresponds to approximately 25% of the overall gas storage capacity of the Italian underground gas storages.

Key takeaways

- The underground storage facilities in Italy have a working volume of 195 TWh, corresponding to 20% - 30% of the country's annual gas demand.
- Italy has succeeded so far in meeting the filling trajectories and targets set in the Gas Storage Regulation, as well as a national target of 90% set by the Italian legislation. On November 1st, 2022, the filling level was 95%.
- Despite the very challenging market conditions, the measures implemented in 2022 have led to almost same filling levels compared to pre-2021 during the withdrawal period, and the stocks in the beginning of 2023 remained higher in comparison to the past 5 years.
- Since the beginning of the 2000', the SSOs were obligated to establish and maintain strategic reserves in their storages, which can be used only in case of emergency, following permission by the Ministry of the Environment and Energy Security. For 2022 and 2023 the strategic reserves amounted to 4.6 bcm. These reserves were established by the SSOs many years ago, therefore there are no additional costs incurred in 2022 due to this measure.
- Several temporary measures were put in place to facilitate storage filling only during the winter period 2022/23:
 - Auctions for monthly storage injection capacity were carried out once per week from April 1st to October 31st, 2022. Additionally, the auctions for modulation storage services were carried out with zero reserve price, and the SSOs did not charge storage users for the technical consumption of compression and treatment plants. Revenue losses due to the implementation of the measure are recovered through the existing storage tariff reconciliation mechanism.
 - Snam was tasked with procuring and injecting in storage the gas volumes required for the operation of the transmission system and the storage facilities. The costs are recovered through the neutrality mechanism for the system balancing of the transmission system, paid by the Cassa per i Servizi Energetici e Ambientali (Cassa). The gas volumes stored in 2022 amounted to 0.7 bcm.
 - Snam and Gestore dei Servizi Energetici (GSE) undertook storage filling of last resort obligations, to ensure that sufficient gas is in storage during the winter period. For this measure a budget of up to 3.3 bil. € could be allocated to Snam by the Cassa, and 4 bil. € to GSE in the form of a zero-interest State loan. Snam procured 1.3 bcm of gas in 2022 through this mechanism. Both Snam and GSE are to sell the procured gas to the market and return the revenues to the Cassa and the State, respectively.
 - As financial incentives, storage users are provided with a stock premium, to ensure the required levels of storage filling in the end of October 2022. The option to sign contracts for differences was also offered to storage users. The stock premium measure had a significant contribution to securing the required filling levels, as its contribution corresponds to almost 60% of the volume of gas stored in 2022. On the other hand, interest for the CfDs was limited (contributing just 1% of the stored volumes), mainly due to the measure's complexity.
 - A penalty was applied to storage users that hold gas stocks below the minimum level assigned by the SSO in the end of October 2022.

- The measures related to the offering of storage capacity by the SSOs, Snam's obligations for procuring operational gas and the provision of stock premiums and CfDs are monitored by ARERA. The Ministry monitors the filling of last resort obligations of Snam and GSE (Snam is also monitored by ARERA).

Latvia

Overview

Gas storage infrastructure (August 1 st , 2023)	
Aggregate GWV	22.6 TWh
Injection capacity	128 GWh/d
Withdrawal capacity	74 GWh/d

Storage filling targets of Gas Storage Regulation and actual gas in storage					
2022			2023		
	Target	Actual		Target	Actual
1 August	25%*	48%	1 February	20%	44%
1 September	28%	50%	1 May	18%	40%
1 October	32%	53%	1 July	28%	62%
1 November	35%	58%	1 September	39%	83%
			1 November	39%	N/A

* Latvia falls under Article 6a(2) of the Gas Storage Regulation. The filling trajectories and target have been adjusted as foreseen in Annex Ia of the Regulation: pro rata intermediate target shall be calculated by multiplying the value indicated in the table of Annex Ia, by the limit of 35 % and by dividing the result by 80 %.

Measures applied in the MS for gas storage		
a) Minimum volume in gas storage	f) Financial incentives for market participants	
b) Tender of capacities	g) Unused booked capacities	
c1) Balancing stock managed by TSO	h) Strategic storage	✓
c2) Obligations imposed on designated entities	i) Appointment of dedicated entity	
d) Coordinated instruments	j) Discounts on storage tariffs	
e) Voluntary joint procurement mechanisms	k) Capital and operational expenditures	
Other		

Applicable legal and regulatory framework

The main legislative document containing provisions on the use of Latvia's storage facility for security of supply is the Energy Law²⁷⁶, issued on September 3rd, 1998, and amended later in 2022²⁷⁷, aiming to strengthen continuity of gas supply, with supplements in Articles 1 and 82 (the meaning of energy supply, security reserves and the requirements in order to ensure continuous supply with natural gas).

²⁷⁶ [Link](#) to Energy Law.

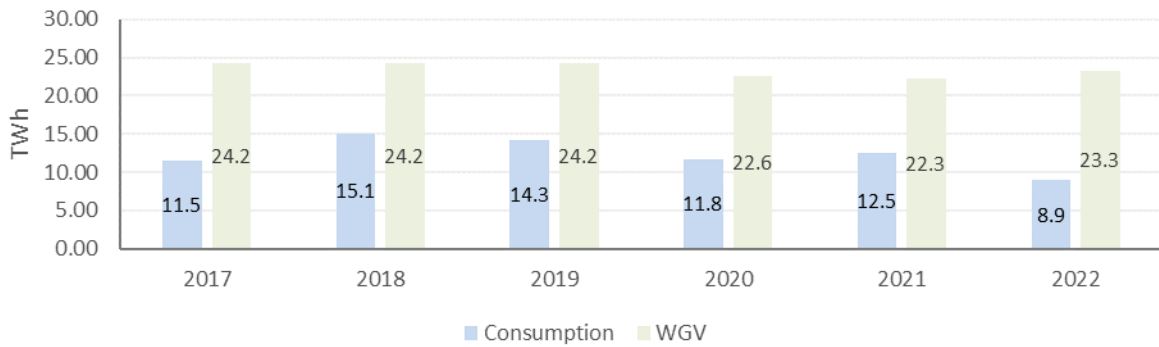
²⁷⁷ [Link](#) to 2022 amendment of Energy Law.

Furthermore, Decision No.1/14²⁷⁸ of the Public Utilities Commission (PUC) defines the terms for the operation of Inčukalns underground gas storage, including the capacity allocation mechanism.

Gas storage infrastructure

The underground gas storage infrastructure in Latvia has a total gas working volume of 22.6 TWh, withdrawal capacity of 74 GWh/d and injection capacity of 128 GWh/d²⁷⁹. Between 2017 and 2022, the country’s storage capacity was significantly higher than the annual consumption. Latvia also stores natural gas on behalf of neighbouring countries. Figure 66 shows how the storage capacity compares to the annual consumption for the period 2017 to 2022.

Figure 66: Storage capacity and annual gas consumption from 2017 to 2022²⁸⁰



Latvia has a single underground gas storage facility, Inčukalns UGS, shown in the map below.

Figure 67: Underground gas storage facilities in Latvia²⁸¹



The storage facility is operated by Conexus. Its technical characteristics are presented in Table 87.

Table 87: Gas storage operators and infrastructure²⁸²

Name	GWV (TWh)	Injection (GWh/d)	Withdrawal (GWh/d)
Conexus (Inčukalns UGS)	22.6	128	74

²⁷⁸ [Link](#) to Decision No. 1/14.

²⁷⁹ Source: GIE (August 1st, 2023).

²⁸⁰ Sources: GIE Eurostat.

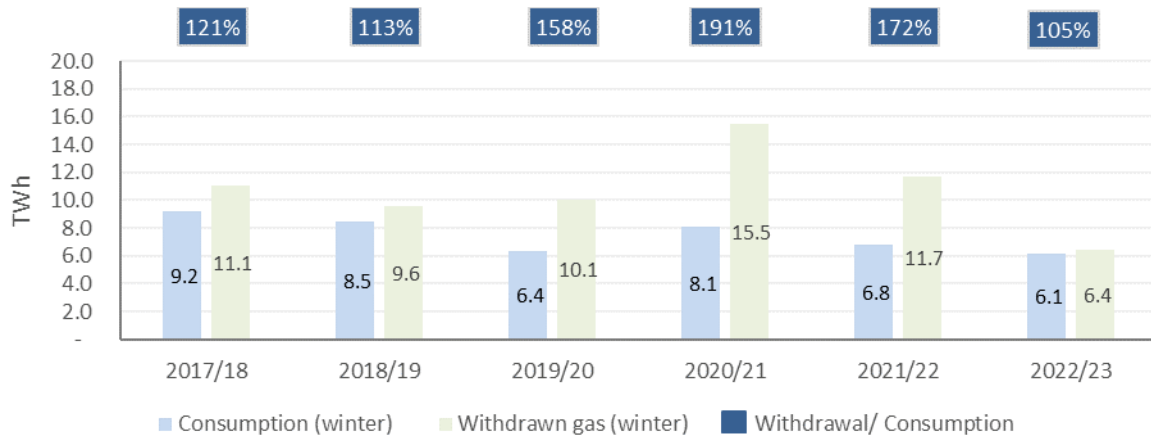
²⁸¹ Source: GIE Storage Map.

²⁸² Source: GIE. Figures as of 27/06/2023.

Gas storage operation and filling targets

Between 2017 and 2023, gas withdrawals from the Inčukalns underground gas storage during the winter (November of one year to March of the next) were significantly higher than gas demand in the same period, as part of the withdrawn gas was delivered to other countries in the Baltics (Figure 68).

Figure 68: Use of gas storage to cover demand in the winter season²⁸³



Latvia satisfies the conditions laid down in Article 6a(2) of the Gas Storage Regulation, due to the fact that the capacity of its underground storage facility²⁸⁴ as a share of the average annual gas consumption over the preceding five years (2017 – 2021) amounts to 185%, and thus is way higher than the 35% threshold of the Regulation. The filling targets and trajectories for the country in 2022 and 2023, as established in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301, are presented in the Table below (the trajectories and targets have been adjusted as foreseen in Gas Storage Regulation for Member States falling under Article 6a(2)²⁸⁵). No national targets have been set, different from those in the Gas Storage Regulation.

Table 88: Targets and trajectories for Latvia in 2022 and 2023²⁸⁶

2022	1 August	1 September	1 October	1 November	
	25%	28%	32%	35%	
2023	1 February	1 May	1 July	1 September	1 November
	20%	18%	28%	39%	39%

The filling level of Inčukalns UGS in 2022/23 was lower than the gas stocks during the period 2019 – 2021 (Figure 69).

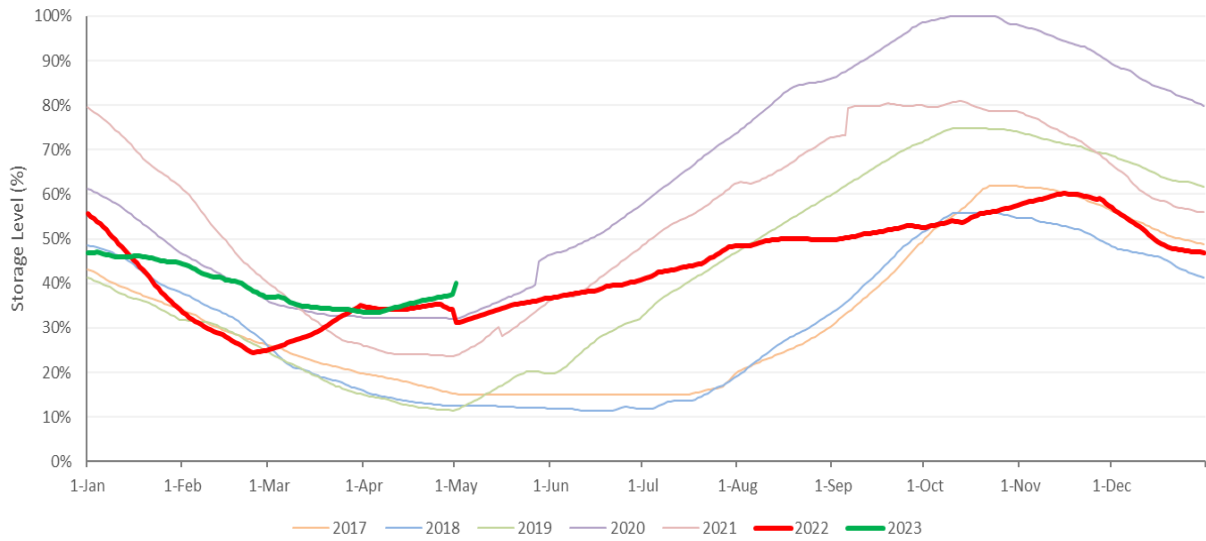
²⁸³ Source: GIE (for withdrawal) and Eurostat (for consumption).

²⁸⁴ As of November 1st, 2022.

²⁸⁵ For Member States falling under Article 6a(2), the pro rata intermediate target shall be calculated by multiplying the value indicated in the table by the limit of 35 % and by dividing the result by 80 %.

²⁸⁶ Filling trajectories and targets as stated in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301.

Figure 69: Comparison of daily gas filling trends between 2017 and 2023²⁸⁷



Storage tariffs at the Latvian storage facility (offered as bundled one- and two-year products) were almost halved between the 2019/20 and 2020/21 storage cycles and continued decreasing in 2021/22. The tariff for the one-year product decreased by another 15% for the 2023/24 cycle (Table 89).

Table 89 Evolution of tariffs²⁸⁸

Tariffs	2019/20	2020/21	2021/22	2022/23	2023/24
1-year bundled (€/MWh)	3.5206	1.3792	1.0226	1.0226	0.8761
2-year bundled (€/MWh)	4.9006	2.8474	1.0865	1.0865	1.0865

Overview of national measures

The Energy Law already included, prior to 2022, a measure for using its storage facility for security of supply purposes, by requiring the TSO to maintain a strategic natural gas reserve. The amendments to the Law in 2022, designated the State-owned company Latvenergo to maintain a safety reserve of energy supply (additional to the strategic reserve of the TSO). The gas quantities of the strategic reserve for 2023 are defined in the Law (1.8 – 2.2 TWh).

The mechanism outlined above corresponds to point (h) from the list of Article 6b(1) of the Gas Storage Regulation:

Measure	Implementation	Relevance to Article 6b(1) measures
Strategic reserve maintained by the TSO, and safety reserve procured and stored by a State-designated company (Latvenergo).	Amended in 2022	Adopting effective instruments for the purchase and management of strategic storage by public or private entities (point (h) of Article 6(b)(1)).

This measure is analysed in detail below.

²⁸⁷ Source: GIE.

²⁸⁸ Source: Conexus storage booking tariffs ([Link](#)).

Regarding the latter, since 2000 (with changes introduced in 2021) storage capacity has been allocated through tenders. Although this measure corresponds to point (b) of Article 6b(1) of the Gas Storage Regulation, the mechanism was not put in place for security of supply purposes and thus it is not analysed further in this Study.

National measures implemented due to the Gas Storage Regulation

Strategic storage (point (h) of Article 6b(1))

Implementation of the measure

Until 2022, the Energy Law (Section 1, Paragraph one, Clause 5¹) required the TSO, JSC Conexus Baltic Grid, to maintain a strategic natural gas reserve in the Inčukalns underground gas storage, amounting to 0.315 TWh.

With the amendments of 2022, the Energy Law defines introduced the term "safety reserves" (Section 1, Paragraph one, Clause 7¹), as natural gas reserves which are property of the State, maintained in order to ensure continuous supply of natural gas and prevent the occurrence of an energy crisis. These safety reserves are additional to the strategic reserve maintained by the TSO.

The Transitional Provisions of the Law (Paragraph 59) provide that the safety reserves are purchased and injected into the Inčukalns underground gas storage by the State-owned company Latvenergo. The gas volumes to be stored must amount to 1.8 to 2.2 TWh and should be established by January 1st, 2023. The Cabinet of Ministers must reexamine the quantities of the safety reserves every 2 years, on the basis of an assessment carried out by the Ministry of Economy.

Conexus, the Latvian TSO and SSO, must ensure the availability of Inčukalns underground gas storage capacity for the safety reserves. In particular, the storage capacity required by Latvenergo to maintain the gas stocks is deducted from the available capacity offered by the SSO to the market participants for the next season.

The safety reserves may not be sold by Latvenergo. The Cabinet of Ministers decides on their use in case of emergency (described in Cabinet Regulation No. 312²⁸⁹).

Recovery of costs associated with implementation of the measure

Latvenergo covers all its costs, related to the purchase of gas and its transportation through cross-border points, through the State budget.

Conexus recovers the relevant storage costs by including them in the transmission tariffs charged for the national exit point.

Monitoring and transparency

The Ministry of Climate and Energy is responsible for monitoring the implementation of the measure.

The gas volumes that Latvenergo should establish as safety reserves are published in the Energy Law. The associated costs however are not published.

Effects on the gas market

No impact of the measure on the gas market has been reported.

²⁸⁹ [Link](#) to Cabinet Regulation 312.

Difficulties and risks with the implementation of the measure

No difficulties or risks with the implementation of the measure were reported.

Application of the measure in 2022/23

For 2023, the safety reserves should amount to 1.8 – 2.2 TWh, depending on the availability of supply of liquefied natural gas ships. The gas stocks established by Latvenergo in the Inčukalns underground gas storage in September 2023 amounted to 1.84 TWh. The TSO, Conexus, continued to keep in storage 0.315 TWh. Consequently, the aggregate reserves maintained in Inčukalns UGS amount to 2.155 TWh.

National measures in place prior to the Gas Storage Regulation

The establishment of safety reserves was already in place since 1998. This measure was amended in 2022 and therefore discussed in the Section above (see measure [Strategic storage](#)).

Key takeaways

- There is only one underground storage facility in Latvia (Inčukalns UGS) with a capacity of 22.6 TWh. The facility's capacity is significantly higher than the country's annual gas consumption and is used by neighbouring Baltic States.
- Latvia is compliant with the targets of the Gas Storage Regulation, by satisfying the conditions laid down in Article 6a(2) (capacity as a share of average annual gas consumption amounts to 185%, with the threshold being at 35%).
- The amendments to the Energy Law in 2022 assigned to State-owned Latvenergo the task of setting up a gas reserve in the Inčukalns UGS. This reserve cannot be sold, and can be used in case of a crisis, following decision by the Cabinet of Ministers.
- According to the Law, Latvenergo should establish gas reserves of 1.8-2.2 TWh until the end of 2022 (1.84 TWh were in place in September 2023). The gas quantities will be reassessed by the Cabinet of Ministers every two years.
- The costs of Latvenergo are covered by the State budget, except for the storage tariffs, which are charged in the transmission tariffs to the national exit point.

Netherlands

Overview

Gas storage infrastructure (August 1 st , 2023)	
Aggregate GWV	142.5 TWh
Injection capacity	1,412.6 GWh/d
Withdrawal capacity	2,834.2 GWh/d

Storage filling targets of Gas Storage Regulation and actual gas in storage ²⁹⁰					
	2022			2023	
	Target	Actual		Target	Actual
1 August	54%	68%	1 February	31%	68%
1 September	62%	78%	1 May	25%	61%
1 October	71%	92%	1 July	41%	79%
1 November	80%	92%	1 September	57%	95%
			1 November	73%	N/A

Measures applied in the MS for gas storage		
a) Minimum volume in gas storage	f) Financial incentives for market participants	✓
b) Tender of capacities	g) Unused booked capacities	
c1) Balancing stock managed by TSO	h) Strategic storage	
c2) Obligations imposed on designated entities	i) Appointment of dedicated entity	✓
d) Coordinated instruments	j) Discounts on storage tariffs	
e) Voluntary joint procurement mechanisms	k) Capital and operational expenditures	
Other		

Applicable legal and regulatory framework

To facilitate filling of the underground storage facilities, the National EZK and LNV Subsidies Regulation, was amended on May 27th, 2022, with Regulation WJZ/22208367 of the Ministry of Economic Affairs and Climate Policy, to include a subsidy concerning the filling of the Bergermeer gas storage facility (Article 4(9))²⁹¹.

²⁹⁰ The intermediate filling trajectory targets for the Netherlands have to be calculated on the basis of the provisions provided for in Article 6a(3) of the Gas Storage Regulation, as a result of the exports to the UK. This leads to the following targets for 2023: 31% (1 Feb); 25% (1 May); 41% (1 July); 57% (1 Sept) and 73% (1 Nov).

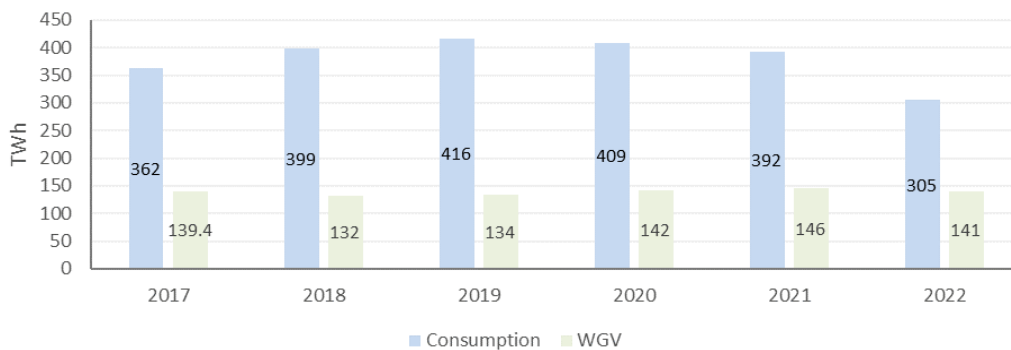
²⁹¹ [Link](#) to the National EZK and LNV Subsidies Regulation.

Furthermore, Article 82(3) of the Mining Act²⁹², provides to the Ministry of Economic Affairs and Climate Policy the competence to order Energie Beheer Nederland B.V. (EBN) to perform additional tasks in favour of the energy policy. The Ministry made use of this provision in 2022 and 2023, and with Letters to the House of Representatives of the States General on April 22nd, 2022 (Nr. 29023)²⁹³, December 9th, 2022 (DGKE-DE/22573501)²⁹⁴ and June 23rd, 2023 (DGKE-DE / 27574197)²⁹⁵ it assigned storage filling duties to EBN.

Gas storage infrastructure

The underground gas storage infrastructure in the Netherlands has a total gas working volume of 142.5 TWh, withdrawal capacity of 2,834 GWh/d and injection capacity of 1,413 GWh/d²⁹⁶. On average, the storage capacity corresponds to 37% of the country’s gas consumption over the period 2017 – 2021, while in 2022 this share amounted to 46%. Figure 70 shows how the storage capacity compares to the annual consumption for the period 2017 to 2022.

Figure 70: Storage capacity as share of the annual gas consumption from 2017 to 2022²⁹⁷



Netherlands has a total of 7 underground gas storage facilities (the facilities in Nuttermoor are located in Germany but are connected to the Dutch grid). The largest facility is UGS Norg, with a capacity of 59.3 TWh. The locations of the country’s UGSs are presented in the map below.

Figure 71: Underground gas storage facilities in Netherlands²⁹⁸



²⁹² [Link](#) to the Mining Act.

²⁹³ [Link](#) to the Letter of the Ministry in April 2022.

²⁹⁴ [Link](#) to the Letter of the Ministry in December 2022.

²⁹⁵ [Link](#) to the Letter of the Ministry in 2023.

²⁹⁶ Source: GIE (August 1st, 2023).

²⁹⁷ Sources: GIE, Eurostat.

²⁹⁸ Source: GIE Storage Map.

Storage facilities in the Netherlands are operated by EnergyStock, EWE Gasspeicher, NAM and TAQA. The technical characteristics of the storage facilities of each SSO are presented in Table 90.

Table 90: Gas storage operators and infrastructure

Name	GWV (TWh)	Injection (GWh/d)	Withdrawal (GWh/d)
EnergyStock (UGS EnergyStock)	3.65	316.8	432
EWE Gasspeicher ²⁹⁹	2.5	65.3	97.2
UGS Nuttermoor H-1	1.5	48.7	69.6
UGS Nuttermoor H-4	1	16.6	27.6
NAM	83.19	602.81	1421.62
UGS Grijskerk	23.85	154.06	620.2
UGS Norg	59.34	448.75	801.45
TAQA	48.15	427.69	523.43
UGS Bergermeer	48.15	427.69	523.43
UGS Alkmaar	5	0	360

In addition to the underground gas storage facilities, the Netherlands can also store gas at its LNG facilities, with aggregate storage capacity of 695,210 m³ LNG, as shown in the Table below.

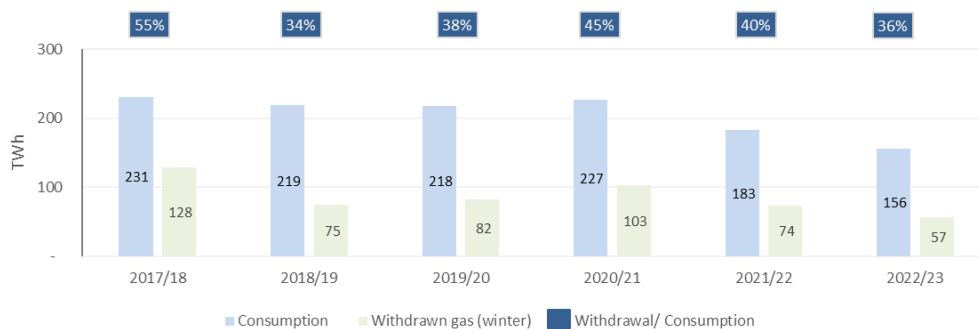
Table 91: Storage capacity at LNG facilities³⁰⁰

Storage Facilities	Storage Capacity (m3 LNG)
EemsEnergy LNG Terminal	155,210
Rotterdam Gate Terminal	540,000

Gas storage operation and filling targets

Withdrawals of gas from the Dutch underground storage facilities during the winter period (November of one year to March of the next) have ranged considerably. In 2017/18 gas withdrawals in winter corresponded to 55% of gas consumption during that period, while in 2022/23 this share dropped to 36% (Figure 72).

Figure 72: Use of gas storage to cover demand in the winter season³⁰¹



²⁹⁹ The physical location of the storage sites is in Germany; however, they only serve the Dutch market.

³⁰⁰ Source: GIE.

³⁰¹ Source: GIE, EnergyStock and Eurostat.

The filling targets and trajectories for the Netherlands in 2022 and 2023, as established in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301, are presented in the Table below (for 2023 these have been adjusted making use of the clauses in Article 6b(3) of the Regulation). The Dutch Government has also set as a national target to reach 90% filling level in 2023/24³⁰².

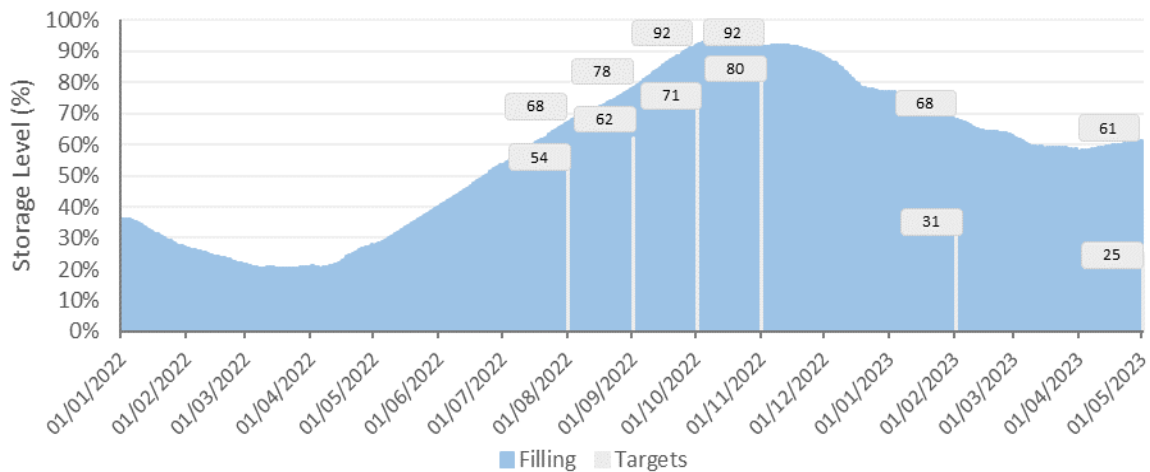
Table 92: Targets and trajectories for Netherlands in 2022 and 2023³⁰³

2022	1 August	1 September	1 October	1 November		
	54%	62%	71%	80%		
2023³⁰⁴	1 February	1 May	1 July	1 September	1 November³⁰⁵	
	31%	25%	41%	57%	EC	NT
					73%	90%

The Netherlands satisfies the conditions laid down in Article 6a(2) of the Gas Storage Regulation, as the capacity of its underground storage facilities³⁰⁶ as a share of the average annual gas consumption over the preceding five years (2017 – 2021) amounts to 35.3%, marginally above the 35% threshold of the Regulation. Although the Netherlands satisfies the conditions laid down in Article 6a(2), it does not make use of this clause.

The Netherlands has succeeded in meeting and even exceeding the EC Gas Regulation storage filling trajectories and targets for 2022 and 2023 so far, as shown in Figure 73. On November 1st, 2022, the filling level reached 92%.

Figure 73: Daily gas in storage vs filling targets in 2022 and 2023³⁰⁷



³⁰² Letter of the Ministry in December 2022 ([Link](#)).

³⁰³ Filling trajectories and targets as stated in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301.

³⁰⁴ The 2023 trajectories and target for the Netherlands have been calculated on the basis of the provisions of Article 6a(3) of the Gas Storage Regulation, due to exports to the UK.

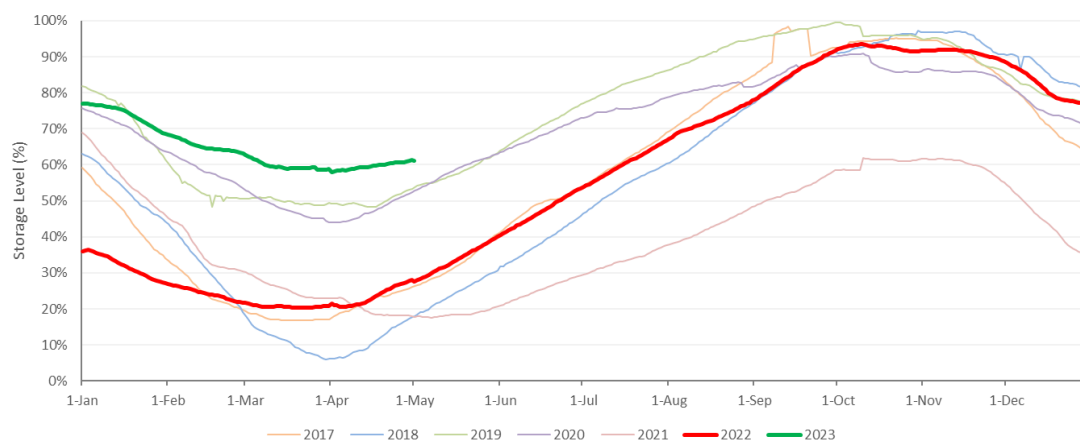
³⁰⁵ EC: Target in Commission Implementing Regulation (EU) 2022/2301, NT: National Target

³⁰⁶ As of November 1st, 2022.

³⁰⁷ Source: GIE, EnergyStock.

The storage filling level during the winter of 2022 followed the same trend with that of the past 5 years, with the exception of 2021, during which the gas in storage was considerably lower. Filling levels in the beginning of 2023 have been slightly higher than those observed in 2019 and 2020 (Figure 74). Measures implemented in 2022 appear to have contributed to attaining filling levels similar to those pre-2021.

Figure 74: Comparison of daily gas filling trends between 2017 and 2023³⁰⁸



Overview of national measures

On May 27th, 2022, the Ministry of Economic Affairs and Climate Policy published a decision which amended the National EZK and LNV Subsidies Regulation, so as to expand the subsidy model to provide incentives to the gas market participants to fill the gas storage facility of Bergermeer during the winter period of 2022 – 2023. The measures focus only on UGS Bergermeer because it is the only commercial seasonal storage in the Netherlands and thus can be filled by market participants. For UGS Norg and Grijskerk other arrangements have been made between the Government and GasTerra, which fills these gas storages.

Furthermore, in 2022, the Ministry of Economic Affairs and Climate Policy instructed EBN to fill the storage facility of Bergermeer in the event that market participants do not undertake sufficient actions to fill the storage fully by themselves.

The mechanism outlined above correspond to points (f) and (i) from the list of Article 6b(1) of the Gas Storage Regulation:

Measure	Implementation	Relevance to Article 6b(1) measures
Subsidy model incentivizing market participants to fill the gas storage facility of Bergermeer.	2022 (to be prolonged to 2023)	Providing financial incentives for market participants, including for storage system operators, such as contracts for difference, or providing compensation to market participants for the shortfall in revenues or for costs incurred by them as a result of obligations on market participants, including storage system operators which cannot be covered by revenue (point f).

³⁰⁸ Source: GIE, EnergyStock.

EBN was assigned by the Ministry to fill the storage facility of Bergermeer in the event that market parties do not fill the storage completely.	2022 – 2023 (prolonged to 2024)	Appointing a dedicated entity tasked with meeting the filling target in the event that the filling target would not otherwise be met (point i).
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These measures are analysed in detail below.

National measures implemented due to the Gas Storage Regulation

Financial incentives for market participants (point (f) of Article 6b)

Implementation of the measure

The amendment of the National EZK and LNV Subsidies Regulation in May 2022 introduced a subsidy scheme, aiming to stimulate market participants to fill:

- Unbooked capacity in the Bergermeer gas storage (corresponding to 4.17 TWh), and
- Capacity already booked by the market participants.

The goal of the subsidy is to cover price risks occurring through the summer-winter spread. The scheme was initially established for 2022. The Government has announced its intention to extend the subsidy scheme for 2023 (approval by the European Commission is pending).

Parties eligible to receive the subsidy are those having signed in 2022 a standard storage service agreement with the operator of UGS Bergermeer, TAQA. The eligibility rules include criteria that do not allow entities established outside the EU, with direct or indirect Russian State interests (of over 50%), to apply for the subsidy (especially considering that 40% of the facility's capacity has been booked by Gazprom).

To apply for the subsidy, market participants have to take part in a tender, in which they may offer a discount ("afslag") to the subsidy to be received. The subsidy is awarded on the basis of a merit order of the amounts requested. The Rijksdienst voor Ondernemend Nederland (RVO), an agency of the Dutch Government, has undertaken to receive and evaluate the subsidy applications.

The subsidy awarded in a storage user is calculated based on the following formula:

$$\text{Subsidy} = \text{spread} - \text{"afslag"} + \text{price guarantee.}$$

Where:

- "Spread" is the price spread that takes into account the weighted arithmetic average of the TTF Q1-23/DA spread for the period between June 13th until October 20th, 2022, excluding the days where the spread was below -16 euro/MWh³⁰⁹. The TTF Q1-23/DA spread is the value of TTF Q1 2023, less the value of TTF Day-Ahead, for a day in the price period on which the gas storage Bergermeer was available for injection.
- "afslag": is the discount offered by the market participant when applying for the subsidy. In 2022, for parties who intended to fill unbooked capacity the discount was capped to a maximum 6.831 €/MWh while for storage already booked the cap was equal to 3.991 €/MWh (different caps apply for the 2023 scheme).

³⁰⁹ For the respective period in 2023, the threshold was adjusted to -15 euro/MWh.

- “Price guarantee”: is a guarantee that the market parties must pay, equal to 0.264 €/MWh for 2022, and 0.8096 €/MWh for 2023.

If the result of the formula is negative, then the subsidy in €/MWh is allocated to the storage user and applies to the obligation for storage filling undertaken by the user.

The subsidy is connected to the obligation of the recipients to sustain a certain amount of gas in storage on November 1st, 2022, and February 1st, 2023. In particular, the recipient of the subsidy must ensure that the amount of stored gas at Bergermeer on their behalf:

- On November 1st, 2022, is equal to 100% of the capacity for which a subsidy was granted, and
- On February 1st, 2023, is at least 38% of the capacity for which a subsidy was granted.

Recovery of costs associated with implementation of the measure

Currently, the subsidy costs are part of the State budget. However, there are plans to introduce in the legislation a surcharge on the transmission tariffs, so that the costs are borne by the market participants. Such a surcharge may apply at the earliest from 2025 onwards.

Monitoring and transparency

The RVO is responsible for monitoring implementation of the measure. Furthermore, the recipients of the subsidy should inform the Ministry in case their storage filling obligations for November and February are not met.

The results of the subsidy scheme (number of participants, volumes awarded, and subsidy granted) are published by the Ministry.

Effects on the gas market

The measure had no impact on the market (due to the positive spread in 2022 the subsidy scheme was not used in practice).

Difficulties and risks with the implementation of the measure

No difficulties or risks with the implementation of the measure were reported.

Application of the measure in 2022/23

The budget assigned to the subsidy for 2022 was 406 mil. €, subsequently adjusted to 366 mil. €. For 2023 the budget for the measure amounts to 240 mil. €.

In 2022, 8 companies applied for the subsidy concerning the unbooked capacity of 4.17 TWh, of which 4 were awarded with the subsidy. For the capacity already booked, 12 companies applied, of which 5 were assigned a subsidy for a total capacity of 8.41 TWh³¹⁰. In total, the subscribed capacity through the subsidy in 2022 amounted to 12.7 TWh awarded.

Due to the positive summer-winter spread, the actual cost of the measure for the Government was zero (the subsidy formula resulted in a positive value).

³¹⁰ [Link](#) to the results of the subsidy tenders.

Appointment of dedicated entity (point (i) of Article 6b)

Implementation of the measure

In 2022, applying Article 82(3) of the Mining Act, the Ministry of Economic Affairs and Climate Policy assigned to EBN (a state-owned entity financially participating in hydrocarbon extraction) the responsibility of filling the underground storage facility of Bergermeer, in the event that the facility is not filled by the storage users.

The gas stocks that EBN must procure are defined by the Ministry of Economic Affairs and Climate Policy. EBN acts like any market participant. It buys gas at the TTF, and books capacity to inject the gas volumes into the storage facility. It then sells the gas it buys on TTF, during the winter period, unless otherwise instructed by the Government.

The Ministry initially requested EBN to store 5 – 11 TWh, depending on the storage filling of the users. Later, this requirement was increased to 15 TWh. As 40% of Bergermeer's available storage capacity is owned by Gazprom, interruptible capacity should be used to fill-in the storage. This is allowed on the basis of the standard storage service agreement between Gazprom and the SSO.

The measure was extended for 2023 in December 2022 (DGKE-DE/22573501). EBN was instructed to maintain in storage its stocks that were in place at the Bergermeer UGS on January 1st, 2023, i.e., 7 TWh. EBN will keep gas in storage until the first quarter of 2024 and purchase additional gas to meet the sales obligations it has entered into during the first quarter of 2023. EBN was also instructed to start filling the facility in January to the level of 15–20 TWh, if this is not done by storage users. As in 2022 interruptible storage capacity should be used.

The Ministry and EBN agreed on a maximum purchase price and a maximum negative spread, to guarantee that in the event of a very cold winter (when gas prices are high), EBN will not unnecessarily remove gas from the market, which may result in gas prices to increase. These conditions also aim to ensure that EBN does not store gas at very high prices or a very negative spread.

Recovery of costs associated with implementation of the measure

The costs for implementing the measure are covered from the State budget. The subsidy provided to EBN is defined each year by the Ministry, foreseen contribution to the management costs (injection, transport, financing cost) and gas procurement. The part of the budget that is not used by EBN to buy gas is returned to the State as dividends.

Monitoring and transparency

Implementation of the measure is monitored by the Ministry of Economic Affairs and Climate Policy in weekly reports. The Ministry reports to the Dutch Parliament in periodical updates on the security of gas supply.

The amounts of gas procured by EBN in 2022 were published in its annual report.

Effects on the gas market

A maximum purchase price and a maximum negative spread has been set for EBN in 2023, so that EBN does not remove gas from the market when prices are high, thus limiting the impact of the measure.

Difficulties and risks with the implementation of the measure

No difficulties or risks with the implementation of the measure were reported.

Application of the measure in 2022/23

In 2022 a budget of 480 mil. € was allocated to the measure, and EBN was instructed to procure at least 11 TWh. EBN procured 12.2 TWh.³¹¹ On December 31st, 2022, EBN had in the Bergermeer UGS 7.2 TWh which corresponds to a 15.8% share of the facility's working gas³¹². The actual cost of the purchases made by EBN has not been disclosed. EBN was given a subsidy of 480 mil. € in 2022, out of which any amount not spent would be returned to the State as dividend.

EBN's 7.2 TWh in storage at the end of 2022 "rolled-over" to 2023. In 2023 EBN received a subsidy of 520 mil. € and has been instructed to fill UGS Bergermeer with up to 20 TWh of gas stocks in the event that the facility is not filled by the storage users.³¹³

National measures in place prior to the Gas Storage Regulation

No measures aiming to enhance filling of gas storage facilities were in place in the Netherlands prior to 2022.

Key takeaways

- The underground storage facilities in the Netherlands have a working volume of 142 TWh. In 2022 to total storage capacity corresponded to 46% of the year's gas consumption.
- The Netherlands has succeeded so far in meeting the filling trajectories and targets, set in the Gas Storage Regulation (no national targets other than those in the Regulation have been set). On November 1st, 2022, the filling level was 92%.
- A subsidy scheme was established in 2022, to incentivise market participants to fill the Bergermeer storage facility. The subsidy is granted if the summer-winter spread is negative. Parties with direct or indirect Russian State interests (of over 50%), are explicitly excluded from the subsidy.
- In 2022 the subscribed capacity though the subsidy amounted to 12.7 TWh awarded. No subsidy was granted, though as the summer-winter spread ended being positive.
- In 2022, the Ministry of Economic Affairs and Climate Policy assigned to Energie Beheer Nederland B.V. (EBN) the responsibility of filling the underground storage facility of Bergermeer if this is not done by the storage users. The measure was extended further in 2023. Interruptible storage capacity must be used by EBN, as 40% of the capacity has been booked by Gazprom.
- Since the beginning of 2023, EBN can buy gas up to a maximum purchase price and a maximum negative spread, to guarantee that EBN will not unnecessarily remove gas from the market if prices are high.
- In 2022, 480 mil. € were allocated to EBN, to procure 5 – 11 TWh. EBN procured 12.2 TWh of gas, 7.2 TWh of which remained in storage on December 31st, 2022 (15.8% of the UGS's capacity). These volumes were maintained in storage in 2023. In 2023, 520 mil. € have been

³¹¹ [Subsidieregeling vullen gasopslag Bergermeer van start | Nieuwsbericht | Rijksoverheid.nl](#)

³¹² EBN Annual Report, 2022 ([Link](#)).

³¹³ [Nieuwe subsidieregeling voor vullen gasopslag Bergermeer | Nieuwsbericht | Rijksoverheid.nl](#)

allocated to EBN, to fill UGS Bergermeer with up to 20 TWh of gas. EBN publishes the gas purchases in its annual reports.

- The costs of both measures are covered by the State budget. However, for the subsidy scheme, the Ministry is considering introducing a surcharge on the transmission tariffs from 2025 onwards, so that the system users pay for it.
- Monitoring of both measures is carried out by the Ministry of Economic Affairs and Climate Policy. The Ministry publishes the results of the subsidy scheme in its website.

Poland

Overview

Gas storage infrastructure (August 1 st , 2023)	
Aggregate GWV	37.5 TWh
Injection capacity	345.03 GWh/d
Withdrawal capacity	595.86 GWh/d

Storage filling targets of Gas Storage Regulation and actual gas in storage					
2022			2023		
	Target	Actual		Target	Actual
1 August	80%	99%	1 February	45%	85%
1 September	80%	99%	1 May	30%	51%
1 October	80%	98%	1 July	50%	71%
1 November	80%	99%	1 September	70%	96%
			1 November	90%	N/A

Measures applied in the MS for gas storage			
a) Minimum volume in gas storage		f) Financial incentives for market participants	
b) Tender of capacities		g) Unused booked capacities	
c1) Balancing stock managed by TSO		h) Strategic storage	
c2) Obligations imposed on designated entities	✓*	i) Appointment of dedicated entity	
d) Coordinated instruments		j) Discounts on storage tariffs	
e) Voluntary joint procurement mechanisms		k) Capital and operational expenditures	
Other			

* Measure in place prior to the Gas Storage Regulation and not amended in 2022

Applicable legal and regulatory framework

Poland's security of gas supply is regulated by two legislative documents:

- the Energy Law (April 10th, 1997)³¹⁴, and
- the Act on Stocks³¹⁵ (February 16th, 2007).

³¹⁴ [Link](#) to the Energy Law.

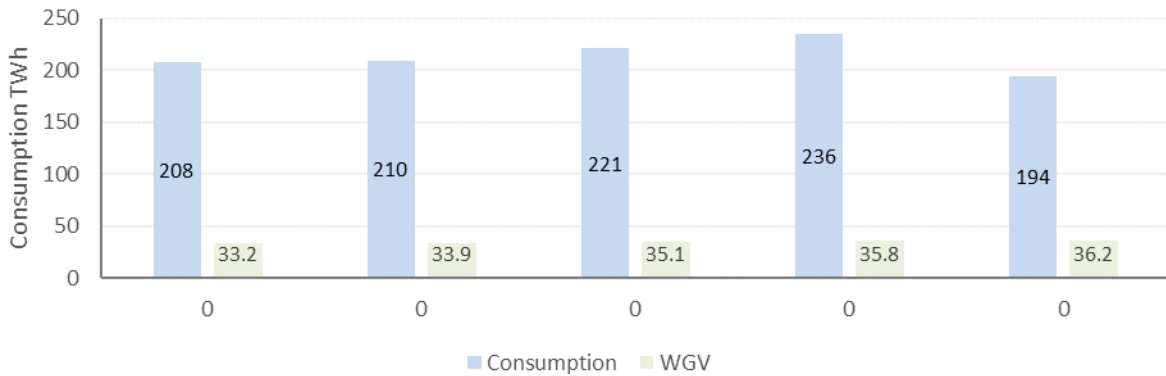
³¹⁵ [Link](#) to the Act of February 16th, 2007.

Both Acts are directly linked with the implementation of the provisions of EU Regulation No 2017/1938. Certain parts of these Acts were amended in August 2022. These amendments added provisions for managing emergency situations but did not substantially change the measures related to gas stockholding, related to the Gas Storage Regulation (the only relevant amendment concerned an increase of the days at which gas stocks should be made available, from 40 to 50, by September 30th, 2024, in Article 70d of the Act on Stocks).

Gas storage infrastructure

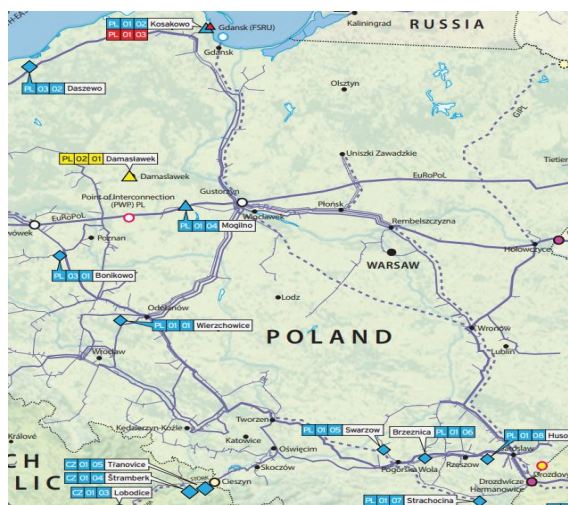
The underground gas storage infrastructure in Poland has a total gas working volume of 37.5 TWh, withdrawal capacity of 595.86 GWh/d and injection capacity of 345.03 GWh/d³¹⁶. Storage capacity in Poland corresponds to just below 20% of the country’s annual gas needs. Figure 75 shows how the storage capacity compares to the annual consumption for the period 2017 to 2022.

Figure 75: Storage capacity and annual gas consumption from 2017 to 2022³¹⁷



Poland has 7 underground gas storage facilities. Six of these are grouped into 2 virtual gas storages (VGSs). The largest storage facility is UGS Wierchowice, with a working gas volume of 14.7 TWh. The locations of the country’s UGSs are presented in the map below.

Figure 76: Underground gas storage facilities in Poland³¹⁸



³¹⁶ Source: GIE, [GSP](#) (August 1st, 2023).

³¹⁷ Sources: GIE, GSP, Eurostat.

³¹⁸ Source: GIE Storage Map.

All storage facilities are operated by GSP. The technical characteristics of each VGS are presented in Table 93.

Table 93: Gas storage operators and infrastructure

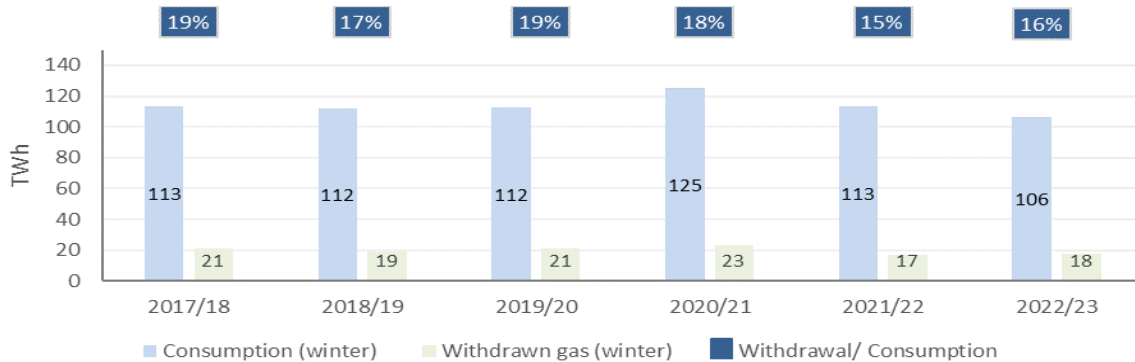
Name	GWV (TWh)	Injection (GWh/d)	Withdrawal (GWh/d)
GSP	37.54	345.03	595.86
VGS GIM Sanok	13	103.81	129.90
VGS GIM Kawerna	9.81	133.70	307.56
UGS Wierchowice	14.73	107.52	158.4

Poland also has LNG storage capacity at the Świnoujście LNG Terminal (total storage capacity of 320,000 m³ LNG); however, no storage services are offered at the terminal by its operator.

Gas storage operation and filling targets

Between 2017 and 2023 (up to date), gas withdrawals from the Polish underground storage facilities during the winter period (November to March of each gas year) correspond to a share of 15% - 20% of gas demand over the same period (Figure 77).

Figure 77: Use of gas storage to cover demand in the winter season³¹⁹



The filling targets and trajectories for Poland in 2022 and 2023, as established in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301, are presented in the Table below. No national targets have been set, different from those in the Gas Storage Regulation.

Table 94: Targets and trajectories for Poland in 2022³²⁰ and 2023³²¹

2022	1 August	1 September	1 October	1 November	
	80%	80%	80%	80%	
2023	1 February	1 May	1 July	1 September	1 November
	45%	30%	50%	70%	90%

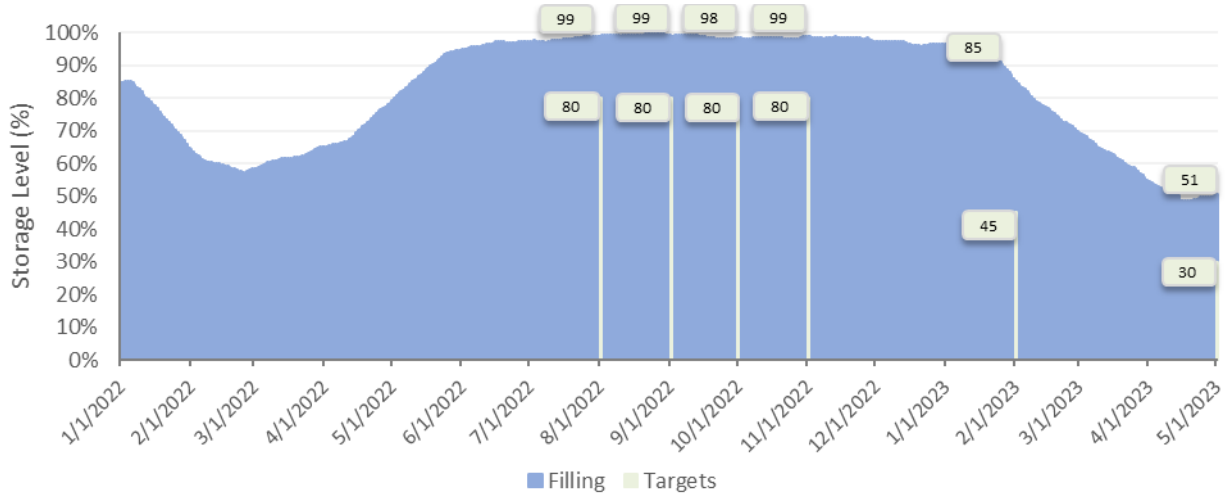
³¹⁹ Source: GIE (for withdrawal) and Eurostat (for consumption).

³²⁰ [Link](#) to Filling trajectories and targets as stated in Annex Ia of Regulation (EU) 2022/1032.

³²¹ [Link](#) to Filling trajectories and targets as stated in Annex Ia of Regulation (EU) 2022/1032.

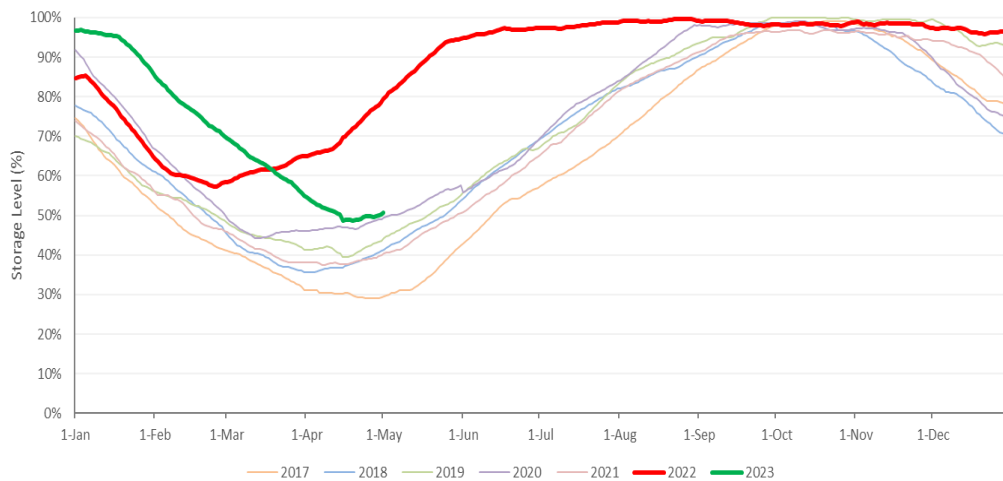
Poland has succeeded in meeting and even exceeding the EC Gas Regulation storage filling trajectories and targets for 2022 and 2023 so far (Figure 78). A storage filling of 99% was reached in August 2022, and remained at that level until December. Gas in storage continues to be higher than the foreseen trajectories in 2023 so far.

Figure 78: Daily gas in storage vs filling targets in 2022 and 2023³²²



Storage filling during the winter of 2022/23 followed the same trend with the previous years, as storages were almost filled in September of 2017 – 2021. In 2022 however storage fillings of above 95% were achieved in June, 3 months earlier than the previous years (Figure 79).

Figure 79: Comparison of daily gas filling trends between 2017 and 2023³²³



Overview of national measures

Poland already had in place a measure involving storage facilities for security of supply purposes, prior to the entry into force of the Gas Storage Regulation.

The Act on Stocks requires that gas suppliers and final consumers importing gas to maintain mandatory stocks covering 30 days of their average imports that can be delivered within 40 days to

³²² Source: GIE.

³²³ Source: GIE.

the Polish gas system. These stocks must be maintained in Polish storage facilities, or, under certain conditions, in storages of other countries.

The mechanism outlined above corresponds to point (c.2) from the list of Article 6b(1) of the Gas Storage Regulation:

Measure	Implementation	Relevance to Article 6b(1) measures
Gas suppliers and final consumers importing gas must maintain mandatory gas stocks covering 30 days of imports.	Prior to 2022 ³²⁴	Imposing an obligation on other designated entities for the purpose of safeguarding the security of gas supply in the case of an emergency (point (c.2) of Article 6(b)(1)).

This measure is analysed in detail below.

National measures implemented due to the Gas Storage Regulation

The measure applied in Poland, aiming to use the country's storage facility for security of supply purposes, were already in place before 2022 and the entry into force of the Gas Storage Regulation.

National measures in place prior to the Gas Storage Regulation

Imposed obligations on designated entities (point (c.2) of Article 6b)

Implementation of the measure

Chapter 3 of the Act on Stocks requires all entities importing gas (gas suppliers, operators, final consumers) to establish and maintain mandatory gas stocks in underground storage facilities. These stocks correspond to 30 days of their average daily gas net imports corresponding to the period from April 1st of the previous year to March 31st of the current year. Each gas importer estimates the volumes of gas stocks it must establish and submits these estimates to the Energy Regulatory Office (ERO) for verification, by May 15th of each year. The stocks must be put in place from October 1st of the current year to September 30th of the next year. For entities planning to start gas imports, URE determines the amount of mandatory stocks on the basis of import forecasts.

The mandatory stocks must be held in underground storage facilities in Poland, which are connected to the transmission or distribution system and have the technical capability to make the full quantity of the stocks available within 40 days (50 days as of September 30th, 2024). It is also possible for an entity to meet its obligation by storing gas at another Member State, of member of the European Free Trade Agreement or European Economic Area, provided that the technical parameters of the storages and transmission systems allow delivery of all the stored gas to the Polish system within 40 days (50 days as of September 30th, 2024), and that the entity has booked firm capacity at all the involved infrastructures.

³²⁴ An amendment in 2022 increased the days at which gas stocks should be made available, from 40 to 50, by September 30th, 2024. As this change has not been carried out yet, this measure is considered in the analysis as one in place prior to the Gas Storage Regulation.

The entities obligated to maintain mandatory stocks can outsource this responsibility to another trader upon ERO license (ticketing service). ERO ex-ante approves or denies a stock ticketing service agreement.

The mandatory gas stocks can be released by the TSO, upon decision by the Minister responsible for energy. In case the stocks were released, the entities responsible for stockholding must replenish them within 4 months (this period may be extended to 8 months following decision by the Minister).

Entities obligated to maintain mandatory stocks that fail to establish mandatory gas stocks are penalized, with a fine of 250% of the value of the gas missing to meet the obligation.

Recovery of costs associated with implementation of the measure

The mandatory stocks are assets of the entities that hold them. For entities with obligation to establish stocks that are subject to regulated tariffs (suppliers selling gas to households and defined public utility consumers), the costs for establishing and maintaining the reserves are considered as justified costs of the activity and are included in the tariff. For suppliers operating in the free market, costs are recovered from their customers.

Monitoring and transparency

ERO, the Minister responsible for energy and the TSO, Operator Gazociągów Przesyłowych GAZ-SYSTEM S.A., are monitoring implementation of the measure. The monitoring obligations of the involved parties are clearly described in the Act on Stocks. As part of the monitoring procedure:

- The SSO submits annually to the TSO information on the technical characteristics of its facilities, together with the mandatory stocks maintained by each entity. The TSO verifies the information and submits it to ERO and the Minister responsible for energy.
- ERO provides to the Minister and the TSO the volumes of mandatory gas stocks that each entity must establish.
- Entities must submit to ERO and the Minister information regarding their mandatory stocks in September, as well as their actions over the past year to establish these stocks.

ERO publishes in its annual report information on the aggregate stock volume and the number of entities obligated to maintain mandatory stocks.

Effects on the gas market

No impact of the measure has been reported. The measure has been in place for several years and has not changed as a result of the Gas Storage Regulation.

Difficulties and risks with the implementation of the measure

No difficulties or risks with the implementation of the measure were reported.

Application of the measure in 2022/23

In 2022 the mandatory gas stocks amounted to 15.94 TWh, assigned to 15 entities, which corresponds to 42% of the country's storage capacity³²⁵. It should be noted that the usual filling level is over 98% at the end of each injection season, implying that the application of this single measure is sufficient to Poland to reach its filling trajectories and targets.

³²⁵ Annual report of the President of URE, 2023 ([Link](#)).

Key takeaways

- The underground storage facilities in Poland have a working volume of 37.5 TWh, corresponding to around 15% - 20% of the country's annual gas demand.
- Poland has succeeded so far in meeting the filling trajectories and targets, set in the Gas Storage Regulation (no national targets other than those in the Regulation have been set). Storages were filled up to 99% from June until December 2022, and gas stocks remained at high levels in 2023 so far.
- Poland has not implemented any new measures to meet the targets of the Gas Storage Regulation. An obligation was already set to entities importing gas, to maintain mandatory gas stocks throughout the gas year, corresponding to 30 days of their average daily net imports. The entities should ensure that the full quantity of the stocks can be made available over a period of 40 days (50 days as of September 30th, 2024).
- The stocks are established in storage facilities in Poland, and under certain circumstances in storages of other countries (provided that the availability of the stocks is ensured). The volume of the stockholding obligation is defined by ERO, with information provided by the entities. The stocks can be released by the TSO, following decision by the Minister responsible for energy.
- For gas suppliers that are subject to regulated tariffs (suppliers selling gas to households and defined public utility consumers), the costs associated with the measure are eligible costs included in the tariff.
- The measure is monitored by ERO, the Minister responsible for energy and the TSO. The monitoring obligations of the involved parties are clearly described in the Act on Stocks.

Portugal

Overview

Gas storage infrastructure (August 1 st , 2023)	
Aggregate GWV	3.6 TWh
Injection capacity	24 GWh/d
Withdrawal capacity	85.7 GWh/d

Storage filling targets of Gas Storage Regulation and actual gas in storage					
2022			2023		
	Target	Actual		Target	Actual
1 August	72%	100%	1 February	70%	100%
1 September	75%	100%	1 May	70%	100%
1 October	77%	100%	1 July	80%	93%
1 November	80%	100%	1 September	80%	100%
			1 November	90%	N/A

Measures applied in the MS for gas storage			
a) Minimum volume in gas storage	✓*	f) Financial incentives for market participants	
b) Tender of capacities	✓*	g) Unused booked capacities	
c1) Balancing stock managed by TSO		h) Strategic storage	
c2) Obligations imposed on designated entities		i) Appointment of dedicated entity	
d) Coordinated instruments		j) Discounts on storage tariffs	
e) Voluntary joint procurement mechanisms		k) Capital and operational expenditures	
Other			

* Measure in place prior to the Gas Storage Regulation and not amended in 2022

Applicable legal and regulatory framework

The provisions of the Gas Storage Regulation are satisfied by employing pre-existing measures, which are defined in the following regulatory documents:

- Decree-Law No. 62/2020, Articles 96 & 97, which entered into force on August 29th, 2020³²⁶, defining obligations for security reserves, and

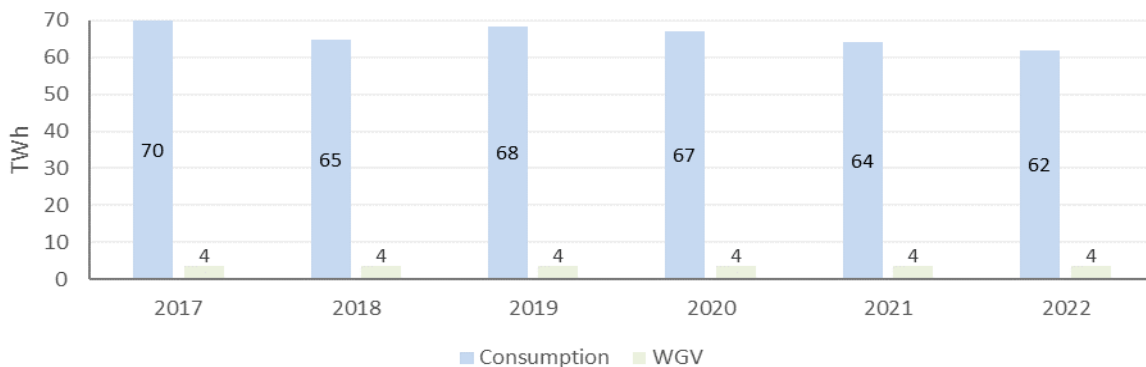
³²⁶ [Link](#) to the Decree-Law No. 62/2020.

- Ordinance 59/2022, which entered into force on January 29th, 2022, and sets the minimum national amount of gas security reserves and determines the constitution of an additional reserve in the national gas system³²⁷.

Gas storage infrastructure

The underground gas storage infrastructure in Portugal has a total gas working volume of 3.6 TWh, withdrawal capacity of 85.7 GWh/d and injection capacity of 24 GWh/d³²⁸. Storage capacity corresponds to a small part of annual gas demand, not exceeding 6%. Figure 80 shows how the storage capacity compares to the annual consumption for the period 2017 to 2022.

Figure 80: Storage capacity and annual gas consumption from 2017 to 2022³²⁹



Portugal has a single underground gas storage facility, Carrico, the location of which is shown in the map below.

Figure 81: Underground gas storage facilities in Portugal³³⁰



The storage facility in Portugal is operated by REN Armazenagem. The technical characteristics of the storage facility are presented in Table 95.

³²⁷ [Link](#) to Ordinance 59/2022.

³²⁸ Source: GIE (August 1st, 2023).

³²⁹ Sources: GIE, Eurostat.

³³⁰ Source: GIE Storage Map.

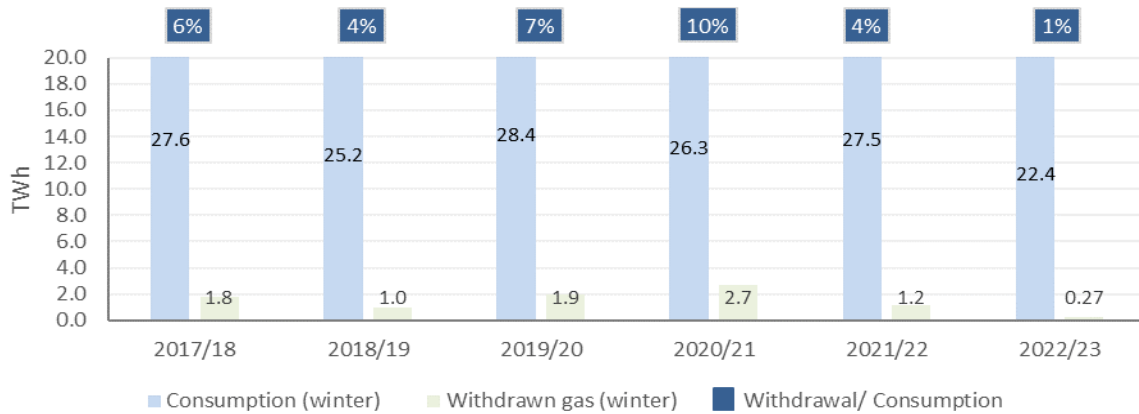
Table 95: Gas storage operators and infrastructure

Name	GWV (TWh)	Injection (GWh/d)	Withdrawal (GWh/d)
REN Armazenagem (Carrico)	3.6	24	85.7

In addition to the underground gas storage facilities, Portugal can also store gas at its LNG facility, of Sines LNG Terminal with total storage capacity of 390,000 m³ LNG³³¹.

Gas storage operation and filling targets

As a result of the low capacity, contribution of gas stored in the Portuguese underground storage facility in covering gas demand in the winter period (November of one year to March of the next) has been small, not exceeding 10% of consumption over the past 6 years, and being as low as 1% in the winter of 2022/23 (Figure 82).

 Figure 82: Use of gas storage to cover demand in the winter season³³²


The filling targets and trajectories for Portugal in 2022 and 2023, as established in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301, are presented in the Table below. No national targets have been set, different from those in the Gas Storage Regulation.

 Table 96: Targets and trajectories for Portugal in 2022 and 2023³³³

2022	1 August	1 September	1 October	1 November	
	72%	75%	77%	80%	
2023	1 February	1 May	1 July	1 September	1 November
	70%	70%	80%	80%	90%

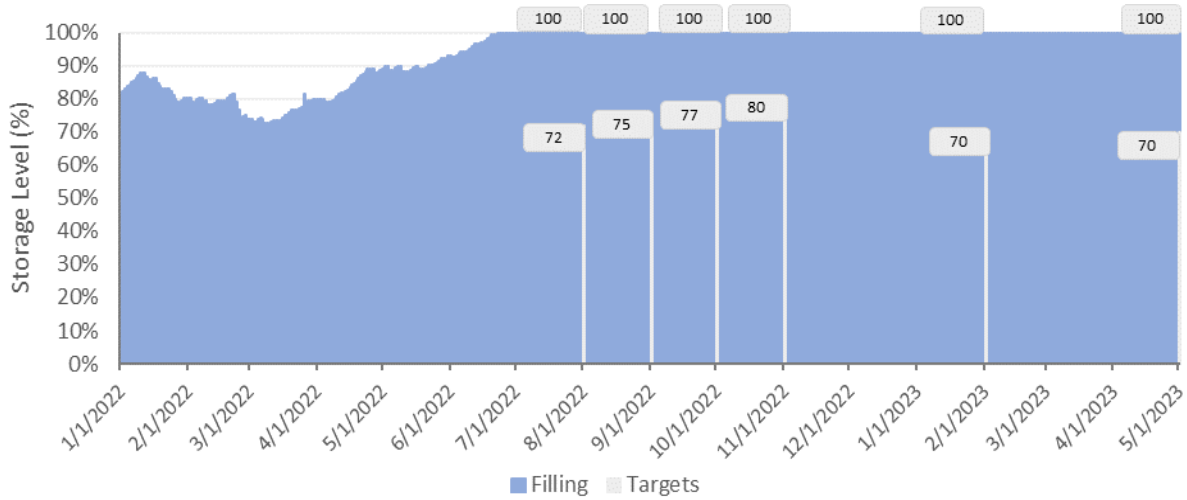
³³¹ Source: GIE.

³³² Source: GIE (for withdrawal) and Eurostat (for consumption).

³³³ Filling trajectories and targets as stated in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301.

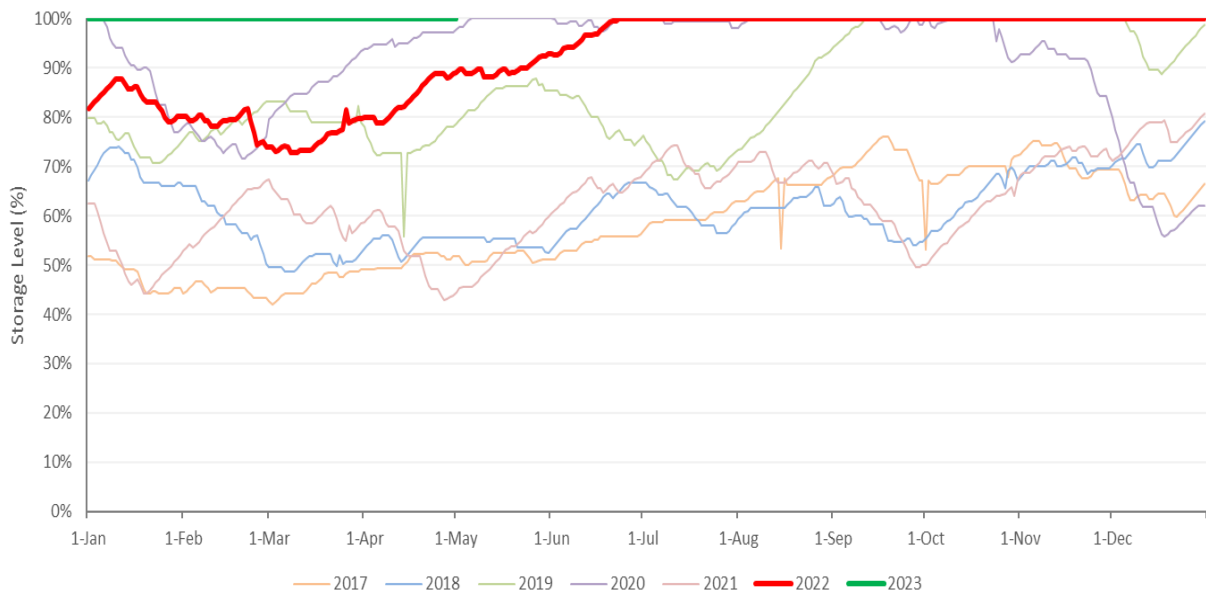
Portugal has succeeded in meeting and even exceeding the EC Gas Regulation storage filling trajectories and targets for 2022 and 2023 so far by achieving a 100% filling rate, which has been maintained so far throughout 2023 (Figure 83).

Figure 83: Daily gas in storage vs filling targets in 2022 and 2023³³⁴



Regarding the daily gas filling levels from 2017 to 2022, similar patterns are observed, however in 2022, contrary to the other years, from mid-June to the end of year the filling level remained steadily at 100% in 2023 (Figure 84). It appears that measures implemented in 2022 resulted in Carrico UGS being completely full for the most of storage year 2022/23, whereas in the past the filling levels fluctuated during the year.

Figure 84: Comparison of daily gas filling trends between 2017 and 2023³³⁵



³³⁴ Source: GIE.

³³⁵ Source: GIE.

Overview of national measures

In Portugal, no new measures were implemented as a result of the Gas Storage Regulation. The pre-existing measure of “security and additional” reserves satisfies the filling trajectories and targets established by Annex Ia of Regulation (EU) 2022/1032 and Annex of Commission Implementing Regulation (EU) 2022/2301.

In more detail, since 2020, Portugal had in place a measure obliging market participants to procure and maintain gas security reserves, at enough quantities to ensure the consumption of protected customers and the uninterrupted operation of the gas-fired power plants. In early 2022, the safety reserve obligation was supplemented by the so-called “additional reserves” obligation, due to the decommissioning of the coal-fired power plants in Portugal and the increase of dependence on combined cycle gas-fired plants³³⁶.

The storage capacity for these reserves is allocated to market participants via tenders that take place at specific allocation windows.

The mechanism outlined above corresponds to two measures from the list of Article 6b(1) of the Gas Storage Regulation:

Measure	Implementation	Relevance to Article 6b(1) measures
Market participants are obligated to maintain security and additional reserves.	Amended in early 2022 (prior to the targets set in the Gas Storage Regulation)	Requiring gas suppliers to store minimum volumes of gas in storage facilities, including in underground gas storage facilities and/or in LNG storage facilities, those volumes to be determined on the basis of the amount of gas supplied by gas suppliers to protected customers (point a).
Tenders with specific allocation windows are taking place to allow market participants to book storage capacity exclusively for the security and additional reserves.	Amended in early 2022 (prior to the targets set in the Gas Storage Regulation)	Requiring storage system operators to tender their capacities to market participants (point b).

These measures are analysed in detail below.

National measures implemented due to the Gas Storage Regulation

The measures applied in Portugal, aiming to use the country’s storage facility for security of supply purposes, were already in place before 2022 and the entry into force of the Gas Storage Regulation.

³³⁶ This amendment was not carried out to meet the filling trajectories and targets set in the Gas Storage Regulation.

National measures in place prior to the Gas Storage Regulation

Minimum volume in gas storage (point (a) of Article 6b(1))

Implementation of the measure

Decree-Law No. 62/2020, Article 96, established the obligation to market participants to ensure the establishment and maintenance of security reserves to guarantee the supply of their customers, under the terms of Regulation (EU) 2017/1938. Article 97 determined that the minimum quantity of security reserves could not be less than the quantities necessary to ensure the consumption of protected customers³³⁷ and to supply the non-interruptible consumption of electricity generating plants.

Ordinance 59/2022 includes provisions for security reserves, with a view to enhancing security of supply for the increasing needs of gas-fired power plants. In particular, Ordinance 59/2022:

- Sets a new minimum overall quantity of gas security reserves and
- Determines the constitution of an additional reserve in the national gas system, in order to ensure a stable and uninterrupted supply of gas to all consumers.

As of December 31st, 2022, the minimum gas security reserves amount to:

- 45 days of average annual consumption by protected customers, and
- 16 days of consumption equivalent to the maximum capacity combined cycle gas-fired power plants with non-interruptible supply.

The security reserves must be permanently available for use, their holders must always be identifiable, and the respective volumes are controlled by the Directorate General for Energy and Geology and by the national transmission system operator.

Regarding the additional reserves, in the period from October 1st of a year to March 31st of the following year, market participants with a gas consumption portfolio must establish and maintain an additional reserve in the underground gas storage facility, defined in a staged way at over the said period. After the indicated period, stocks are free to be used by the respective market participants. The overall amount of the additional reserves varies over the aforementioned period, but it cannot exceed a maximum amount of 700 GWh.

In case that a market participant does not comply with its responsibility of maintaining security and additional reserves, it is subject to financial penalties in accordance with ERSE's sanctioning regime, approved by Law No 9/2013 of 28 January (the penalty may be linked to the company's annual turnover, while market participants in their first year of activity are treated differently).

It should be noted that most of the storage capacity for the security and additional reserves obligations is reserved in a priority way, not market based. In more detail, the standard mechanism for capacity allocation at the storage facility is used with the particularity of having a specific allocation window for the tenders that relate to booking capacity for security and additional reserves. The products available through these tenders include standard capacity products which may be annual, quarterly, or monthly. The standard reserve price for storage capacity applies to these tenders. The TSO, REN

³³⁷ Protected customers are the domestic clients connected to a distribution gas network as well as the small and medium-sized enterprises and the essential social services (including health care services, social aid help, emergency, security, education, or public administration).

Gasodutos, who is responsible for monitoring this measure, publishes the results of the security reserve tenders.

Recovery of costs associated with implementation of the measure

The market participants recover the costs of establishing and maintaining security and additional reserves by incorporating these costs in the price paid by their customers.

The costs from the implementation of this measure are not published and ERSE has no information on the costs borne by the market participants to deliver their obligations.

Monitoring and transparency

REN Gasodutos assumes responsibility for monitoring compliance with the obligations of establishing and maintaining the security and additional reserves, as well as for communicating any situations of non-compliance to the Directorate-General for Energy and Geology and to ERSE.

The TSO reports monthly to the Directorate-General for Energy and Geology and to ERSE, regarding the state of the security and additional reserves. There are occasional deviations from small suppliers but that does not affect the filling targets and the security reserves.

The obligation of each individual market participant is not publicly available. The results of the security reserve tenders are published by REN Gasodutos at its website.

Effects on the gas market

The underground storage facility is full most of the time, reducing the flexibility of the gas system management with operational consequences on the LNG terminal. There were instances where, due to reduced demand, the LNG terminal's storage was full and unloading of LNG carriers was not possible, keeping them in Sines port for longer than they should.

Also, the measure resulted in a shortage of storage capacity for commercial purposes, as priority is given to the fulfilment of the security and additional reserves obligation.

The measure requires that any new market participant has to inject gas into the underground storage, which may lead to congestion, as the injection capacity is relatively small compared to the extraction one. In the last years an excess of demanded versus offered capacity was observed at storage capacity auctions. In 2022 the excess capacity requested amounted to 0.4 TWh (amounting to 11% of the overall storage capacity).

Difficulties and risks with the implementation of the measure

One issue raised by ERSE is that in the priority allocation of capacity to serve the obligations, the TSO has to check that the security reservation requests of the users are in accordance with the mandatory consumption forecast. Any market participants entering the system after the annual capacity has been allocated in the respective auctions can only reserve capacity on a quarterly or monthly basis.

Application of the measure in 2022/23

In November 2022 the security reserves were 2.7 TWh and the additional reserves were 0.35 TWh, corresponding to 83% of the storage facility's total capacity. In July 2023 the security reserves were kept at the same level with 2022, i.e., 2.7 TWh.

Tender of capacities (point (b) of Article 6b(1))

As already reported above (see measure [Minimum volume in gas storage](#)), the capacity for the security and additional reserves is allocated to market participants by priority (vs capacity for stocks to be used for commercial purposes) through tenders which have a specific allocation window.

Key takeaways

- There is only one underground storage facility in Portugal (Carrico) with a capacity of 3.6 TWh, corresponding to below 10% of annual consumption.
- Portugal has succeeded so far in meeting the filling trajectories and targets, set in the Gas Storage Regulation (no national targets other than those in the Regulation have been set), and in fact the storage has remained full, from June 2022 until May 2023.
- Measures that ensure storage filling were already in place before the targets of the Gas Storage Regulation were set.
- Decree-Law No. 62/2020 sets to market participants the obligation to establish and maintain security reserves, corresponding to their sales to protected customers and to non-interruptible supply to gas-fired power plants. These security reserves must be permanently available for use, by the Directorate General for Energy and Geology and by the national TSO.
- With Ordinance 59/2022 the security reserves were increased, requiring each supplier to store gas quantities equivalent to 45 days of the average annual consumption by protected customers, and 16 days of consumption corresponding to the maximum non-interruptible needs of combined cycle power plants.
- In addition to security reserves, with Ordinance 59/2022 market participants are also required to establish and maintain additional reserves, only for the period from October 1st of a year to March 31st of the following year. The maximum aggregate additional reserves stored in the facility are 700 GWh.
- To ensure that there is available capacity for market participants to store their security and additional reserves, the respective capacity is allocated through tenders which have a specific allocation window, before the one for commercial capacity.
- The costs associated with the measure are covered by the market participants, who incorporate them to their end-user prices.
- Monitoring of the measure is carried out by REN Gasodutos that reports situations of non-compliance to the Directorate-General for Energy and Geology and to ERSE.
- Filling the storage for security reserves has reduced the Portuguese system's flexibility. As a result, the storage facility cannot act as a buffer in case the LNG terminal's storage is full. Furthermore, commercial use of the storage has diminished.
- In November 2022 the security and additional reserves amounted to 3.07 TWh (83% of the facility's capacity). The security reserves amounted to 2.7 TWh in July 2023.

Romania

Overview

Gas storage infrastructure (August 1 st , 2023)	
Aggregate GWV	33.8 TWh
Injection capacity	258.75 GWh/d
Withdrawal capacity	312.44 GWh/d

Storage filling targets of Gas Storage Regulation and actual gas in storage					
	2022			2023	
	Target	Actual		Target	Actual
1 August	46%	59%	1 February	40%	63%
1 September	57%	74%	1 May	41%	47%
1 October	66%	86%	1 July	67%	68%
1 November	80%	97%	1 September	88%	88%
			1 November	90%	N/A

Measures applied in the MS for gas storage			
a) Minimum volume in gas storage	✓	f) Financial incentives for market participants	
b) Tender of capacities		g) Unused booked capacities	
c1) Balancing stock managed by TSO		h) Strategic storage	
c2) Obligations imposed on designated entities		i) Appointment of dedicated entity	
d) Coordinated instruments		j) Discounts on storage tariffs	
e) Voluntary joint procurement mechanisms		k) Capital and operational expenditures	
Other			

Applicable legal and regulatory framework

On March 18th, 2022, the Emergency Ordinance n. 27³³⁸ entered into force in Romania, regarding measures applicable to final consumers in the electricity and natural gas market for the period from April 1st, 2022, to March 31st, 2023. This Ordinance included stockholding obligations for the gas market participants.

To implement the provisions of the Emergency Ordinance n. 27, ANRE issued in April 2022 Order 66/2022, concerning a methodology for determining the minimum gas stocks of gas supply licensees,

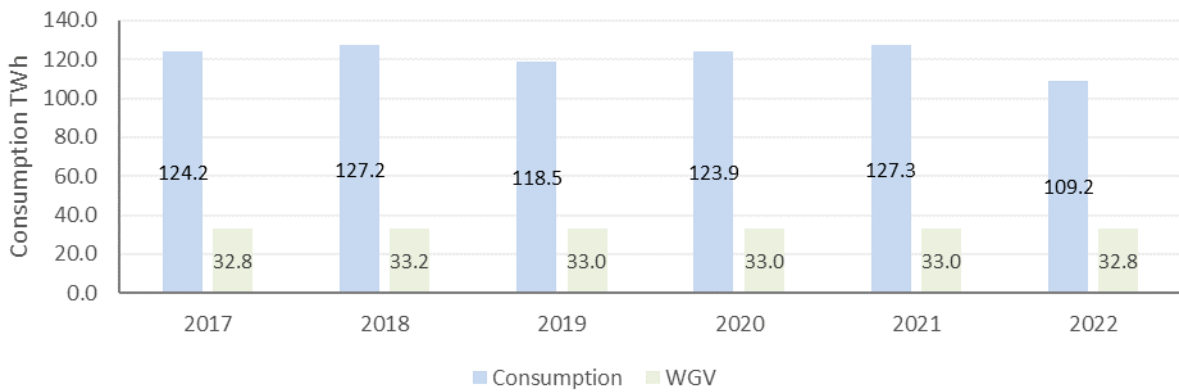
³³⁸ [Link](#) to Emergency Ordinance n. 27 of March 18th, 2022.

for the period April 2022 – October 2022. Subsequently, in February 2023, ANRE issued Order 10/2023, that established a new methodology, to be applied from April 2023 onwards³³⁹.

Gas storage infrastructure

The underground gas storage infrastructure in Romania has a total gas working volume of 33.8 TWh, withdrawal capacity of 312.4 GWh/d and injection capacity of 258.7 GWh/d³⁴⁰. The storage capacity corresponds to around 25% - 30% of the country’s annual gas consumption. Figure 85 shows how the storage capacity compares to the annual consumption for the period 2017 to 2022.

Figure 85: Storage capacity and annual gas consumption from 2017 to 2022³⁴¹



Romania has a total of 6 underground gas storage facilities, the largest being UGS Bilciuresti, with a capacity of 14 TWh. The locations of the country’s UGSs are presented in the map below.

Figure 86: Underground gas storage facilities in Romania³⁴²



Storage facilities are operated by Depogaz Ploiesti (6 facilities) and Depomures (1 facility). The technical characteristics of the storage facilities of each SSO are presented in Table 97.

³³⁹ [Link](#) to ANRE’s Orders.

³⁴⁰ Source: GIE (August 1st, 2023).

³⁴¹ Sources: GIE, Eurostat.

³⁴² Source: GIE Storage Map.

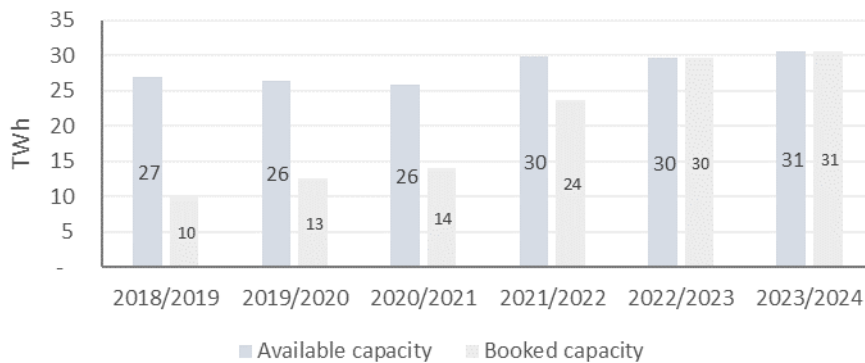
Table 97: Gas storage operators and infrastructure

Name	GWV (TWh)	Injection (GWh/d)	Withdrawal (GWh/d)
Depomures (UGS Targu Mures)	3.14	18	0
Depogaz Ploiesti	30.71	240.75	312.44
UGS Urziceni	3.85	32.1	48.15
UGS Bilciuresti	14.02	107	149.8
UGS Balaceanca	0.53	10.7	12.84
UGS Sarmasel	9.63	69.55	80.25
UGS Chercesti	2.68	21.4	21.4

Gas storage operation and filling targets

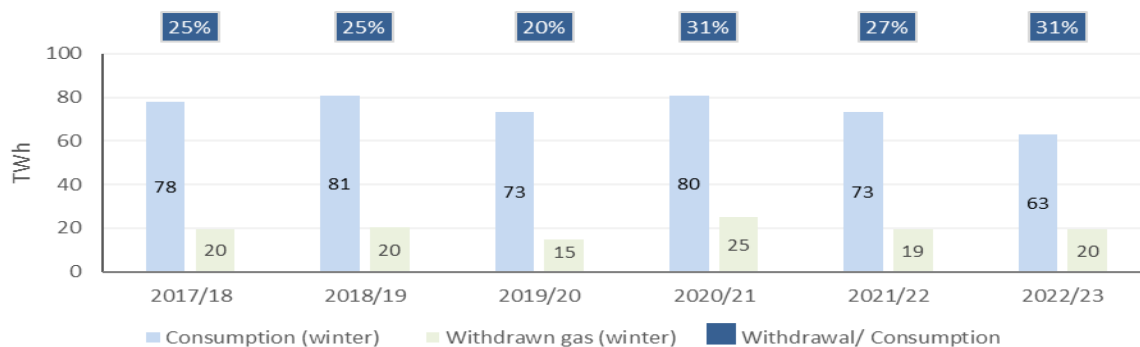
According to storage capacity booking information published by Depogaz, all capacity at its storage facilities were booked for the storage years 2022/23 and 2023/24, while during the previous years, part of the capacity remained uncontracted (Figure 87).

Figure 87: Booked storage capacity of Depogaz ³⁴³



Withdrawals of gas from the Romanian underground storage facilities during the winter period (November of one year to March of the next) over the past 5 years have covered around 20% - 30% of the overall gas consumption in the market (Figure 88).

Figure 88: Use of gas storage to cover demand in the winter season³⁴⁴



³⁴³ Source: Depomures, Access to storage (Link).

³⁴⁴ Source: GIE (for withdrawal) and Eurostat (for consumption).

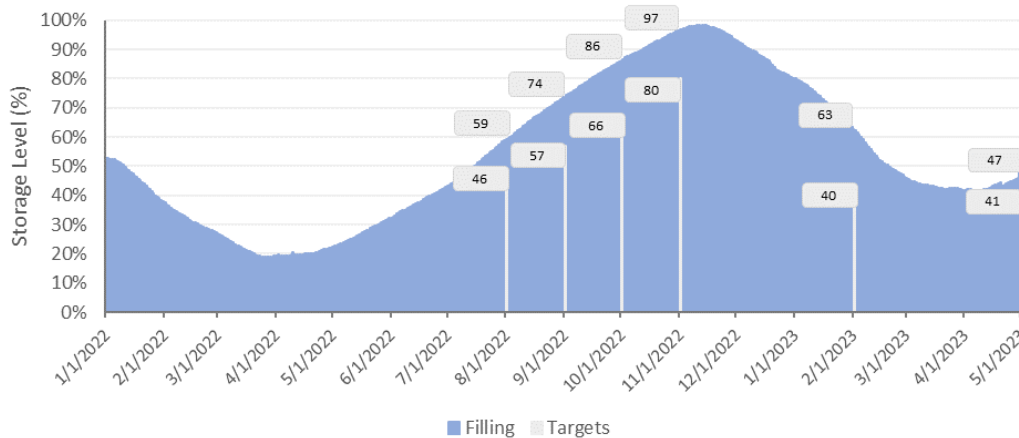
The filling targets and trajectories for Romania in 2022 and 2023, as established in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301, are presented in the Table below. No national targets have been set, different from those in the Gas Storage Regulation.

Table 98: Targets and trajectories for Romania in 2022 and 2023³⁴⁵

2022	1 August	1 September	1 October	1 November	
	46%	57%	66%	80%	
2023	1 February	1 May	1 July	1 September	1 November
	40%	41%	67%	88%	90%

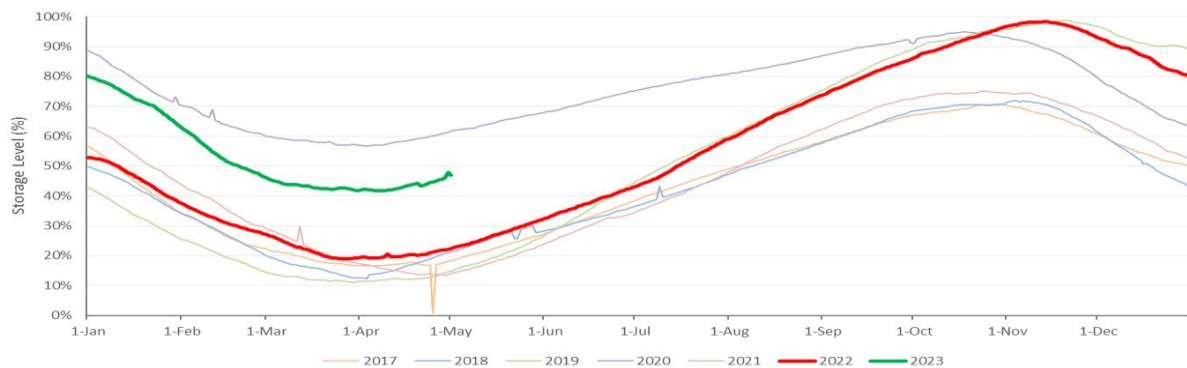
Romania has succeeded in meeting and even exceeding the EC Gas Regulation storage filling trajectories and targets for 2022 and 2023 so far (Figure 89). On November 1st, 2022, the filling level reached 97%.

Figure 89: Daily gas in storage vs filling targets in 2022 and 2023³⁴⁶



The filling level of the Romanian gas storages observed in November 2022 were the highest since 2017, together with those in 2019. The filling levels continued to be higher than most years since the beginning of 2023 (Figure 90).

Figure 90: Comparison of daily gas filling trends between 2017 and 2023³⁴⁷



³⁴⁵ Filling trajectories and targets as stated in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301.

³⁴⁶ Source: GIE.

³⁴⁷ Source: GIE.

The storage tariffs applied by Depogaz increased considerably for the storage cycle 2022/23 and even more, subsequently for the cycle 2023/24. Both the injection and withdrawal tariffs in 2023/24 are around 3 times higher, compared to the 2021/22 levels.

Table 99 Evolution of tariff³⁴⁸

Type of tariff	2021/22	2022/23	2023/24
Working Volume (€/MWh/year)	1.88	2.31	1.98
Injection (€/MWh)	0.46	0.91	1.47
Withdrawal (€/MWh)	0.35	0.70	1.20

Overview of national measures

Storage filling in Romania is ensured by setting an obligation to market participants (gas suppliers of final consumers and heat producers supplying households) to maintain stocks at the underground gas storage facilities until the beginning of the winter period. Market participants had stockholding obligations in the past, however with ANRE's Order 66/2022 initially, and Order 10/2023 subsequently, the obligations were set so as to facilitate filling of storage facilities in line with the requirements of the Gas Storage Regulation.

The mechanism outlined above corresponds to point (a) from the list of Article 6b(1) of the Gas Storage Regulation:

Measure	Implementation	Relevance to Article 6b(1) measures
Gas suppliers and heat producers are obligated to establish and maintain gas stocks at the underground storage facilities until the end of October of each year.	2022	Requiring gas suppliers to store minimum volumes of gas in storage facilities, including in underground gas storage facilities and/or in LNG storage facilities, those volumes to be determined on the basis of the amount of gas supplied by gas suppliers to protected customers (point a)

This measure is analysed in detail below.

National measures implemented due to the Gas Storage Regulation

Minimum volume in gas storage (point a of Article 6b)

Implementation of the measure

According to ANRE's Order 66/2022, the entities responsible for establishing and maintaining gas stocks at Romania's underground storage facilities for the period from April to October 2022 were the following entities:

- Natural gas suppliers, only for the natural gas quantities delivered to final consumers, and

³⁴⁸ Depomures, Access to storage ([Link](#)). Exchange rate applied: 4.949 Lei/EUR.

- Heat producers that opt to purchase natural gas directly from gas producers, only for the gas quantities used for production of heat at CHP plants and district heating plants intended for household consumption (referred to in the Order as PET direct customers).

The gas stocks that each of the above entities must establish corresponded to at least 30% of the amounts of gas that are required by its portfolio of final consumers (or its own consumption in the case of PET direct customers) for the period from November 1st, 2022, to March 31st, 2023. The stocks should have been put in place by the entities within the period from April 2022 to October 2022.

The TSO, Transgaz, was assigned with the responsibility to collect information, for the period November 1st, 2022, to March 31st, 2023, from gas suppliers concerning their expected gas sales to final consumers (including to PET direct customers) and from PET direct customers their expected consumption for heat to be supplied to households. The TSO had the responsibility to calculate the stockholding responsibilities and notify ANRE accordingly.

In February 2023, ANRE, with its Order 10/2023, established a new methodology for stockholding obligations of market participants, which was more directly linked with the filling targets and trajectories set by the Gas Storage Regulation, and applies from April 2023 onwards. The entities having stockholding obligations are the same with those determined by Order 66/2022 (i.e., gas suppliers and PET direct customers).

The minimum gas stocks to be maintained by each gas supplier corresponds to the maximum value between³⁴⁹:

- 90% of the total storage capacity of underground facilities in Romania, excluding the gas stocks maintained by Transgaz for balancing the transmission system, allocated to the gas supplier proportionately to its gas sales to final consumers, and
- 30% of the amounts of gas that are required by the supplier's final consumers for the period November – March.

The gas stocks must be established gradually by the entities over the period April – October of each year. For 2023 the filling trajectory of each entity, to reach its assigned gas stocks is presented in the Table below. These trajectories are set with a tolerance of 5%. After November 1st, the market participants are free to use their stocks without having to meet any other stockholding requirements.

Table 100: Filling trajectories assigned to each Romanian market participant in 2023 to establish its gas stocks

February 1 st	May 1 st	July 1 st	September 1 st	November 1 st
40%	41%	67%	88%	100%

Calculation of each entity's gas stockholding obligations is undertaken by ANRE, based on the following information, which is submitted by February 1st of each year:

- Gas suppliers provide to ANRE their estimated sales to final consumers (including PET direct customers) from April 1st of the year to March 31st of the subsequent year.
- PET direct customers provide to ANRE their expected consumption for heat to be supplied to households from April 1st of the year to March 31st of the subsequent year.

³⁴⁹ The same approach is followed for PET direct customers, with regards to their gas consumption to be used for providing heat to households.

- The SSOs provide to ANRE the storage capacity of their facilities, the available capacity to be offered in the upcoming storage cycle, the gas in storage for each storage user and an estimation of the gas in storage on April 1st.

After receiving this information, ANRE publishes the obligations of the entities. Each entity may establish its gas stocks:

- By purchasing gas and storage capacity by its own.
- By concluding, until March 31st of the year, a purchase agreement for gas already in storage by another entity.
- By concluding contracts assigning the stockholding obligations to other entities.

The gas stocks that an entity already has in storage before the storage cycle are taken into account in its stockholding obligations.

SSOs provide priority to the booking of capacity for the entities' stockholding obligations. Within 3 business days from the publication of the obligations by ANRE, the entities must request from SSOs access to storage capacity. In case the available storage capacity is not sufficient to meet the needs of all entities, then it is allocated pro rata. Any remaining capacity, after all requests of the entities have been covered, are allocated on a first-come-first-served basis.

In case gas sales of suppliers diverge significantly from those estimated (over 10%), the relevant entity must notify ANRE, that recalculates the obligations. To cover the case of supplier switching, at the end of September of each year, all suppliers must submit to ANRE information related to changes in their customer portfolio, so that ANRE may proceed, if necessary, with adjusting the gas stock requirements.

Recovery of costs associated with implementation of the measure

The costs associated with the establishment and storage of stocks are undertaken by the gas suppliers and PET direct consumers. The SSOs are compensated for the storage capacity booked through the storage tariffs.

Monitoring and transparency

ANRE is responsible for monitoring whether the stockholding obligations are met. On the deadlines of the filling trajectories, the gas suppliers and PET direct consumers must submit to ANRE their stock level, including, if applicable, information with regards to any purchases gas in storage provided by other entities, and contracts assigning their stockholding obligations to other entities. Entities that have sold gas in storage, or have assigned part of their stocks, to others, must also inform ANRE accordingly.

There is transparency with regards to the gas stock obligations assigned to each entity. These must be defined in an Order by ANRE, and published at the websites of ANRE, Transgaz and the SSOs.

Effects on the gas market

No impact of the measure on the gas market has been reported.

Difficulties and risks with the implementation of the measure

No difficulties or risks with the implementation of the measure were reported.

Application of the measure in 2022/23

The stockholding obligations of each market participant in 2023, that should be established until October 31st, 2023, were defined by ANRE in its Decision nr. 545/15.03.2023³⁵⁰. The total obligation for all entities **amounts** to approx. 29.9 TWh, corresponding to a storage filling level of 88%. The stocks maintained in storage by the TSO for balancing purposes contributed an additional 0.6 TWh, increasing the filling level to 90%.

According to ANRE's Decision, each entity had to establish stocks that corresponded to over 50% of its estimated gas sales in the period from November 1st, 2022, to March 31st, 2022. The two gas suppliers with the largest market share, Engie Romania and E.ON Energie Romania, were called to store almost 60% of the overall obligations, 9.9 TWh and 7.7 TWh respectively.

National measures in place prior to the Gas Storage Regulation

Gas suppliers in Romania had an obligation to maintain gas stocks in the underground storage facilities in the past. However, with ANRE's Order 66/2022 and subsequently ANRE's 10/2023 the methodology for estimating the stocks was reestablished, to ensure that the filling targets and trajectories of the Gas Storage Regulation are met. These methodologies have already been described in the Section above (see [Minimum volume in gas storage](#)).

Key takeaways

- The underground storage facilities in Romania have a working volume of 33.8 TWh, corresponding to 25% - 30% of the country's annual gas demand.
- Romania has succeeded so far in meeting the filling trajectories and targets, set in the Gas Storage Regulation (no national targets other than those in the Regulation have been set). On November 1st, 2022, the filling level was 97%.
- The injection and withdrawal tariffs increased significantly over the past 2 years, being in 2023/24 3 times higher, compared to the 2021/22 levels.
- The measure used to ensure storage filling was the assignment of obligations to market participants for establishing gas stocks in the period between April 1st and October 1st of each year. The methodology for establishing the stocks is defined by ANRE in its Orders 66/2022 and 10/2023.
- The entities having stockholding obligations are gas suppliers for the gas quantities they sell to final consumers and heat producers for the gas quantities used for production of heat at CHP plants and district heating plants intended for household consumption.
- To meet their obligations, capacity at the storages is allocated to the entities on a pro rata basis.
- ANRE is responsible for monitoring the implementation of the measure, receiving information from the market participants on their filling levels.
- For 2023 the measure requires market participants to fill 88% of the gas storage capacity, with an additional 2% covered with the TSO's stocks for balancing of the transmission system.

³⁵⁰ [Link](#) to ANRE Decision nr. 545/15.03.2023.

Slovakia

Overview

Gas storage infrastructure (August 1 st , 2023)	
Aggregate GWV	38.1 TWh
Injection capacity	411.0 GWh/d
Withdrawal capacity	491.6 GWh/d

Storage filling targets of Gas Storage Regulation and actual gas in storage					
	2022			2023	
	Target	Actual		Target	Actual
1 August	49%	69%	1 February	45%	68%
1 September	60%	75%	1 May	25%	63%
1 October	70%	88%	1 July	27%	83%
1 November	80%	91%	1 September	67%	96%
			1 November	90%	N/A

Measures applied in the MS for gas storage			
a) Minimum volume in gas storage	✓*	f) Financial incentives for market participants	
b) Tender of capacities		g) Unused booked capacities	
c1) Balancing stock managed by TSO		h) Strategic storage	
c2) Obligations imposed on designated entities		i) Appointment of dedicated entity	
d) Coordinated instruments		j) Discounts on storage tariffs	
e) Voluntary joint procurement mechanisms		k) Capital and operational expenditures	
Other			

* Measure in place prior to the Gas Storage Regulation and not amended in 2022

Applicable legal and regulatory framework

The legislative framework in Slovakia related to the operation of underground storage facilities and their use for security of supply purposes includes:

- Law on Energy No. 251/2012³⁵¹, which sets an obligation to store at the underground facilities part of the gas quantities.
- Act on Regulation of Network Industries No. 250/2012³⁵², which defines the basis on which the underground storage facilities are regulated.

³⁵¹ [Link](#) to the Energy Law No. 251/2012.

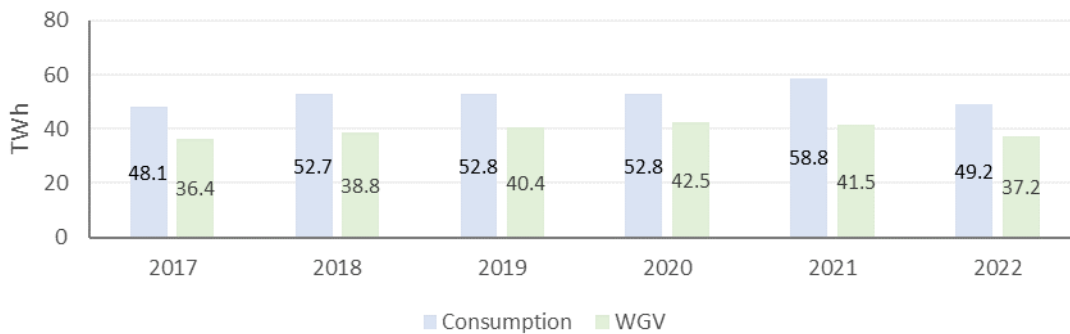
³⁵² [Link](#) to the Act on Regulation in Network Industries No. 250/2012.

Neither of the above legislative documents were amended with a view to implementing the Gas Storage Regulation.

Gas storage infrastructure

The underground gas storage infrastructure in Slovakia has a total gas working volume of 38.1 TWh, withdrawal capacity of 491.6 GWh/d and injection capacity of 411.0 GWh/d³⁵³. Slovakia has large storage capacity compared to its gas needs, corresponding to 70% - 80% of the country’s annual consumption. Figure 91 shows how the storage capacity compares to the annual consumption for the period 2017 to 2022.

Figure 91: Storage capacity and annual gas consumption from 2017 to 2022³⁵⁴



Slovakia has 2 underground gas storage facilities, the largest being UGS Láb, with storage capacity of 30.3 TWh. The locations of the country’s UGSs are presented in the map below.

Figure 92: Underground gas storage facilities in Slovakia³⁵⁵



Storage facilities in Slovakia are operated by Nafta and Pozagas. The technical characteristics of the storage facilities of each SSO are presented in Table 101.

Table 101: Gas storage operators and infrastructure

Name	GWV (TWh)	Injection (GWh/d)	Withdrawal (GWh/d)
Nafta (UGS Láb)	31.2	338.3	418.9
Pozagas (UGS Lab IV)	6.95	72.7	72.7

³⁵³ Source: GIE (August 1st, 2023).

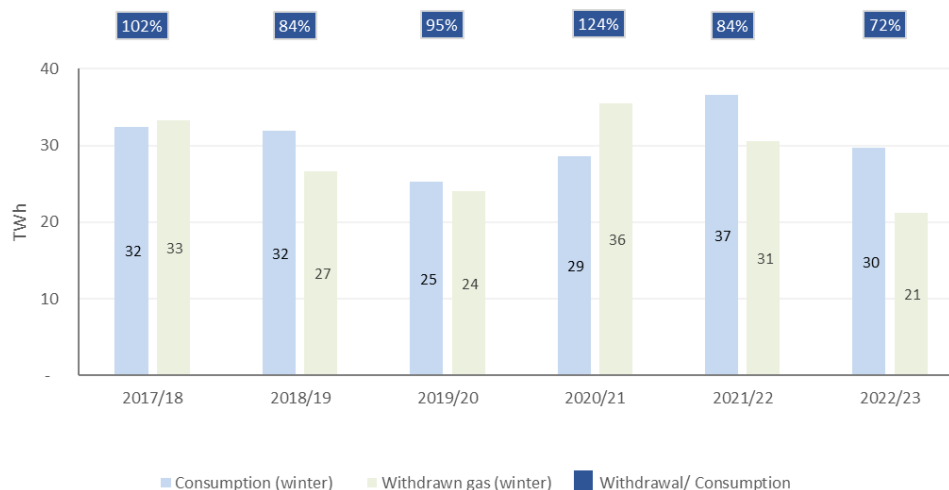
³⁵⁴ Sources: GIE, Eurostat.

³⁵⁵ Source: GIE Storage Map.

Gas storage operation and filling targets

As the Slovakian storage facilities play a regional role, gas withdrawals during the winter period (November of one year to March of the next) were close to and sometimes above the indigenous gas demand. In the winter of 2022, the share of withdrawals to consumption was 72%, the lowest since 2017 (Figure 93).

Figure 93: Use of gas storage to cover demand in the winter season³⁵⁶



The filling targets and trajectories for Slovakia in 2022 and 2023, as established in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301, are presented in the Table below. No national targets have been set, different from those in the Gas Storage Regulation.

Table 102: Targets and trajectories for Slovakia in 2022³⁵⁷ and 2023³⁵⁸

2022	1 August	1 September	1 October	1 November	
	49%	60%	70%	80%	
2023	1 February	1 May	1 July	1 September	1 November
	45%	25%	27%	67%	90%

Slovakia satisfies the conditions laid down in Article 6a(2) of the Gas Storage Regulation, due to the fact that the capacity of the underground storage facilities in Slovakia³⁵⁹ as a share of the average annual gas consumption over the preceding five years (2017 – 2021) amounts to 100%, and thus is way higher than the 35% threshold of the Regulation. Although Slovakia is compliant with the 35% rule, the country has met the targets as laid out in the Gas storage Regulation and the Implementing Regulation, as shown in Figure 94. On November 1st, 2022, the filling level reached 91%, and has remained higher than the trajectories in 2023 so far.

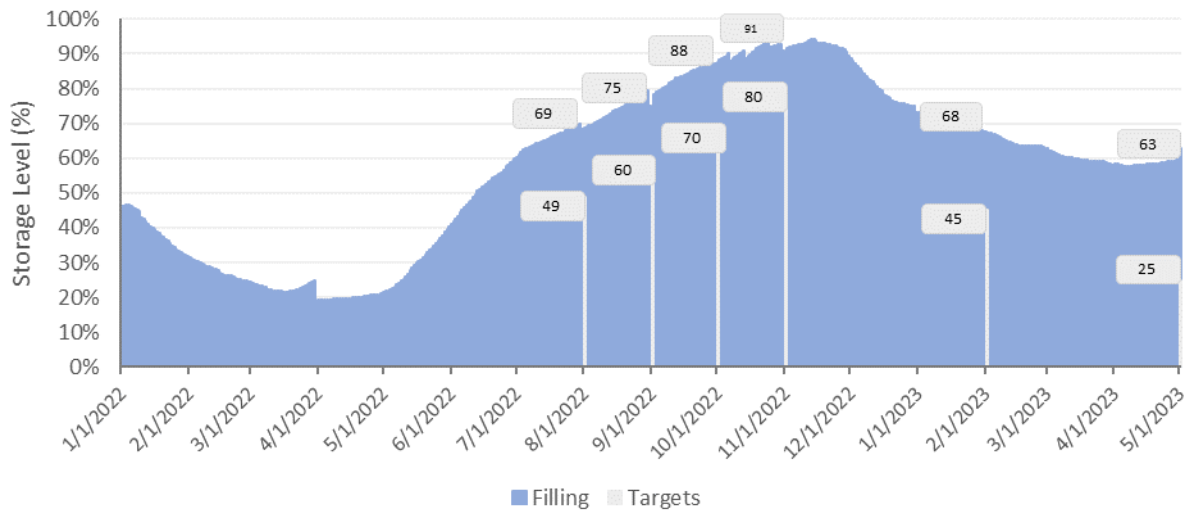
³⁵⁶ Source: GIE (for withdrawal) and Eurostat (for consumption).

³⁵⁷ [Link](#) to the filling trajectories and targets as stated in Annex Ia of Regulation (EU) 2022/1032.

³⁵⁸ [Link](#) to the filling trajectories and targets as stated in Annex Ia of Regulation (EU) 2022/2301.

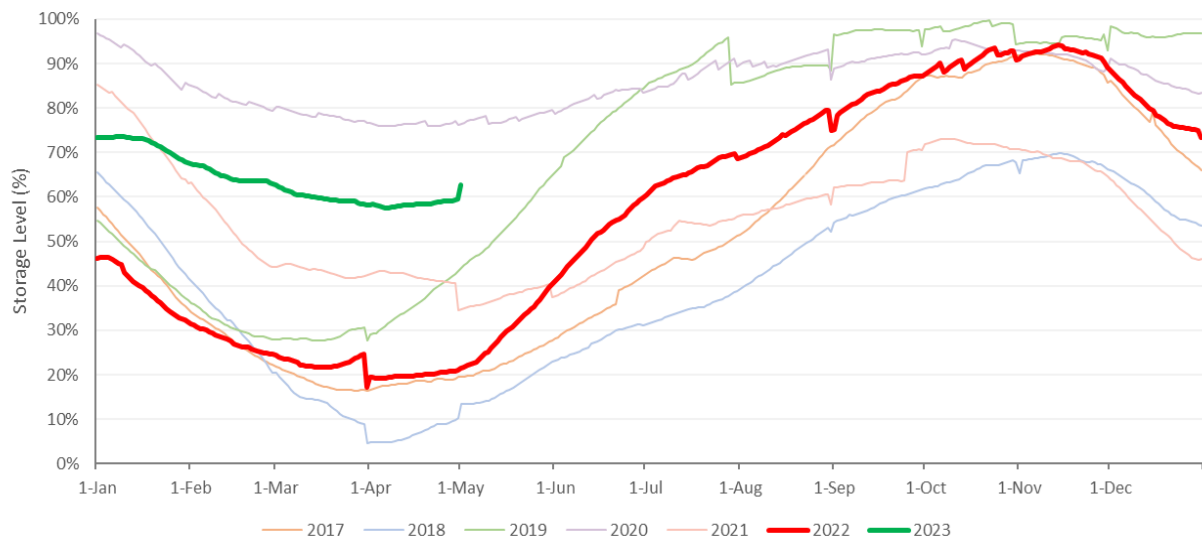
³⁵⁹ As of November 1st, 2022.

Figure 94. Daily gas in storage vs filling targets in 2022 and 2023



Storage filling in 2022 followed a similar trend with the previous 5 years but remained at lower levels than in 2019 and 2020. In 2023 the gas stocks remained high but are still below the 2020 level (Figure 95).

Figure 95: Comparison of daily gas filling trends between 2018 and 2023³⁶⁰



Overview of national measures

Slovakia already had in place a measure involving storage facilities for security of supply purposes, prior to the entry into force of the Gas Storage Regulation.

According to Energy Law No. 251/2012, the DSO, gas suppliers and protected customers which supply gas from an EU Member State or a third party, are required to maintain gas stocks in the underground storage facilities, as part of their responsibilities in meeting the supply standard required by Regulation (EU) 2017/1938. The gas volumes to meet the supply standard are defined by the Ministry of Economy. The Ministry also decides how the required volumes will be established, i.e., if the obligated entities

³⁶⁰ Source: GIE

will have to store the gas volumes (and if storage facilities outside Slovakia will be used) or they will have to contractually secure the volumes. Up to a maximum of 30% of the volumes can be secured by using cross-border capacity. This obligation was not amended due to the Gas Storage Regulation.

The mechanism outlined above corresponds to point (a) from the list of Article 6b(1) of the Gas Storage Regulation:

Measure	Implementation	Relevance to Article 6b(1) measures
DSO, suppliers, and protected customers which supply gas from an EU Member State, or a third party must secure gas volumes to meet the supply standard. The Ministry decides whether these volumes must be stored or contractually secured.	Prior to 2022	Requiring gas suppliers to store minimum volumes of gas in storage facilities, including in underground gas storage facilities and/or in LNG storage facilities, those volumes to be determined on the basis of the amount of gas supplied by gas suppliers to protected customers (point (a) of Article 6(b)(1)).

This measure is analysed in detail below.

Since 2012 storage capacity has been allocated through tenders, with the Act on Regulation of Network Industries No. 250/2012. Although this measure corresponds to point (b) of Article 6b(1) of the Gas Storage Regulation, the mechanism was not put in place for security of supply purposes and thus it is not analysed further in this Study.

National measures implemented due to the Gas Storage Regulation

The measure applied in Slovakia, aiming to use the country's storage facility for security of supply purposes, was already in place before 2022 and the entry into force of the Gas Storage Regulation.

National measures in place prior to the Gas Storage Regulation

Minimum volume in gas storage

Implementation of the measure

The Energy Law No. 251/2012 (§22) assigns the obligation to maintain gas quantities, for meeting the supply standard of Regulation (EU) 2017/1938, to the following entities:

- The DSO, which must ensure gas quantities for households consuming gas.
- Gas suppliers, which must ensure gas quantities for the protected customers³⁶¹ they supply, apart from households.
- Protected customers that supply gas from other Member States or third countries.

The measure applies for the winter period (November 1st to March 31st) of each year, with the gas volumes being established each month. The monthly quantities required by each of the above entities

³⁶¹ The definition of protected customers in Slovakia includes customers connected to the distribution network that are: households, gas-fired heat producers, social facilities, consumers providing ancillary services for electricity generation, food industries, other consumers with annual demand below 100 MWh.

to meet the supply standard are defined by the Ministry of Economy and correspond to the average monthly consumption of the protected customers for the respective month. To this end, the market participants should submit to the Ministry by February 28th of each year a proposal for the method they will follow for ensuring the supply standard for the upcoming winter, for each month separately. By March 31st, after negotiations with the Regulatory Office for Network Industries (URSO) and the market participants, the Ministry of Economy decides on the quantities of each entity.

The Energy Law allows up to 30% of the quantities for meeting the supply standard to be established by using cross-border capacity. The remaining quantities, of at least 70% of the target, must be stored in the underground facilities, or contractually secured in Slovakia. The Ministry of Economy decides how the gas volumes must be established (stored or contractually secured). Based on a decision by the Ministry, the DSO must store the gas volumes stemming from this obligation in the underground storage facility Dolní Bojanovice, located in the Czech Republic.

The DSO, gas suppliers and protected customers having an obligation to maintain stocks may transfer this obligation to another market participant. In the case of the DSO, the obligation can be undertaken by the supplier of last resort. The market participant undertaking the responsibility may use up to 50% of the cross-border capacity for the assigned volumes.

In case an entity does not meet its obligation under the supply standard, a financial penalty is imposed, which, based on §91 of the Energy Act, ranges from 50,000 € up to 10,000,000 €, depending on the scope of the violation / breach of obligations.

Recovery of costs associated with implementation of the measure

The obligations assigned to the DSO, gas suppliers and protected customers are treated as a public service obligation. The entities may apply for compensation for any net costs for carrying out this PSO, so as to cover these costs from the State budget.

Monitoring and transparency

Monitoring of the measure's implementation is carried out by the Ministry of Economy and URSO.

Effects on the gas market

No impact of the measure on the market has been reported.

Application of the measure in 2022/23

Information on the gas volumes established by the obligated entities in 2022 is not available.

Key takeaways

- The underground storage facilities in Slovakia have very large storage capacity (38.1 TWh) compared to its gas demand, corresponding to a share of 70%-80% of annual consumption.
- Slovakia has succeeded so far in meeting the filling trajectories and targets, set in the Gas Storage Regulation (no national targets other than those in the Regulation have been set). On November 1st, 2022, the filling level was 91%. So far, filling levels have remained considerably higher than the corresponding trajectories in 2023.

- Slovakia has not implemented any new measures to meet the targets of the Gas Storage Regulation. An obligation was already set to market participants for establishing gas stocks to meet the supply standard.
- The DSO, gas suppliers and protected customers, which supply gas from EU Member States or third countries, must ensure the availability of sufficient gas every month of the period from November 1st to March 31st, to meet the average consumption of protected customers for the corresponding month. The Ministry of Economy decides if the gas volumes must be stored (and whether storage facilities in Slovakia or other countries will be used) or if the volumes need to be contractually secured. The Ministry has decided that the DSO must store the respective volumes in the Dolní Bojanovice storage, in the Czech Republic.
- The measure is considered as a public service obligation, and any net costs of the obligated entities can be claimed from the Ministry of Economy and covered through the State budget.
- The Ministry of Economy is responsible for defining the gas stock obligations of the market participants, and together with URSO is monitoring implementation of the measure.

Spain

Overview

Gas storage infrastructure (August 1 st , 2023)	
Aggregate GWV	34.1 TWh
Injection capacity	166.6 GWh/d
Withdrawal capacity	241.4 GWh/d

Storage filling targets of Gas Storage Regulation and actual gas in storage					
	2022			2023	
	Target	Actual		Target	Actual
1 August	71%	78%	1 February	59%	90%
1 September	74%	85%	1 May	62%	90%
1 October	77%	90%	1 July	68%	98%
1 November	80%	95%	1 September	76%	100%
			1 November	90%	N/A

Measures applied in the MS for gas storage			
a) Minimum volume in gas storage	✓	f) Financial incentives for market participants	✓
b) Tender of capacities	✓	g) Unused booked capacities	✓
c1) Balancing stock managed by TSO*		h) Strategic storage	✓
c2) Obligations imposed on designated entities		i) Appointment of dedicated entity	✓
d) Coordinated instruments		j) Discounts on storage tariffs	✓
e) Voluntary joint procurement mechanisms		k) Capital and operational expenditures	
Other			

Note: Balancing stock managed by TSOs started being applied in 2023.

Applicable legal and regulatory framework

In 2022 the regulatory framework in Spain was amended, with a view to enhancing security of supply, including inter alia measures related to the use of underground storage facilities:

- Royal Decree 6/2022³⁶² of March 29th, 2022, that, among other provisions, introduced new additional and transitory provisions for gas storages and modified Royal Decree 1716/2004³⁶³,

³⁶² [Link](#) to Royal Decree 6/2022.

³⁶³ [Link](#) to Royal Decree 1716/2004.

of June 23rd, 2004 (that set natural gas stockholding obligations) and Order ITC/3862/2007³⁶⁴, of December 28th, 2007 (that established a capacity allocation mechanism for underground storage facilities).

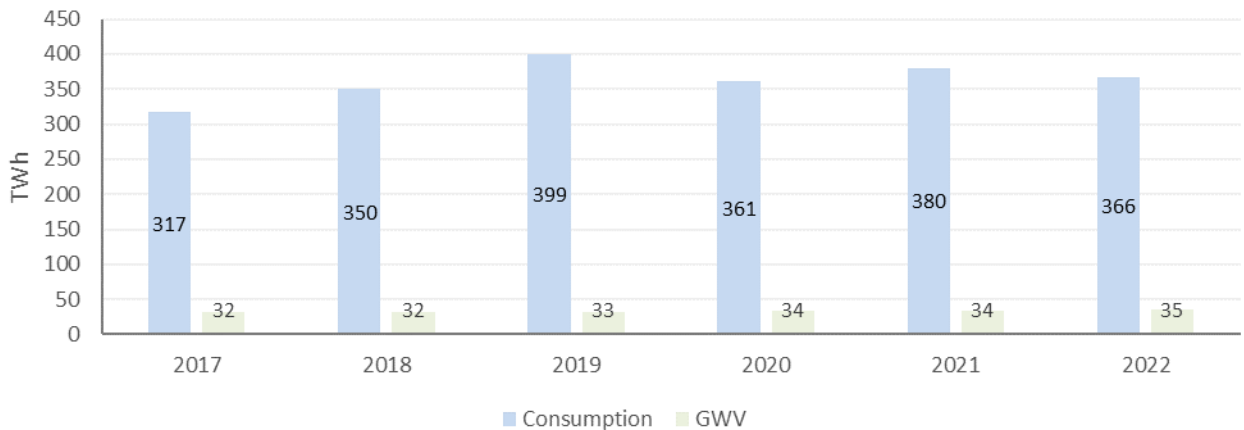
- Royal Decree 20/2022³⁶⁵ of December 27th, 2022, that, among other provisions, extends the transitional measures for gas storage measures until March 31st, 2024.
- Order TED/72/2023, of January 26th, 2023, by the Ministry for the Ecological Transition and the Demographic Challenge (the Ministry), that included provisions for compliance with the obligation to maintain minimum safety stocks of natural gas, and also modified ITC/3862/2007, of December 28th, 2007.

Additionally, with Circular 8/2019³⁶⁶, of December 12th, 2019, the National Commission for Markets and Competition (CNMC), established the methodology and conditions for access and allocation of capacity in the natural gas system, including tendering of capacity at underground storage facilities (the provisions of this Circular did not change with the 2022 modification of the regulatory framework). Finally, CNMC’s Resolution of March 24th, 2022³⁶⁷ introduced, inter alia, congestion management procedures for storage facilities.

Gas storage infrastructure

The underground gas storage infrastructure in Spain has a total gas working volume of 34 TWh, withdrawal capacity of 241.4 GWh/d and injection capacity of 34.1 GWh/d³⁶⁸. Storage capacity corresponds to a small share of Spain’s annual gas consumption, accounting for less than 10%. Figure 96 shows how the storage capacity compares to the annual consumption for the period 2017 to 2022.

Figure 96: Storage capacity and annual gas consumption from 2017 to 2022³⁶⁹



Spain has 4 underground gas storage facilities (the largest being Gaviota), which are grouped together into a single Virtual Gas Storage (VGS). The areas in which the 4 storage facilities are located are presented in the map below.

³⁶⁴ [Link](#) to Order ITC/3862/2007.

³⁶⁵ [Link](#) to Royal Decree 20/2022.

³⁶⁶ [Link](#) to Circular 8/2019.

³⁶⁷ [Link](#) to CNMC’s Resolution of March 24th, 2022.

³⁶⁸ Source: GIE (August 1st, 2023).

³⁶⁹ Sources: GIE, Eurostat.

Figure 97: Storage facilities in Spain³⁷⁰



Storage facilities in Spain are operated by the Technical System Manager (Enagás GTS). The technical characteristics of the storage facilities of each SSO are presented in Table 103.

Table 103: Gas storage operators and infrastructure

Name	GWV (TWh)	Injection (GWh/d)	Withdrawal (GWh/d)
Enagás GTS (VGS)	34.09	166.57	241.37

In addition to the underground gas storage facilities, Spain also has large LNG storage capacity at its regasification terminals. Its aggregate LNG storage capacity amounts to 3,316,500 m³ LNG, as shown in the Table below.

Table 104: Storage capacity at LNG facilities³⁷¹

Storage Facilities	Storage Capacity (m ³ LNG)
Bilbao LNG Terminal	450,000
Barcelona LNG Terminal	760,000
Cartagena LNG Terminal	587,000
Huelva LNG Terminal	619,500
Sagunto LNG Terminal	600,000
Mugardos LNG Terminal	300,000
Musel LNG Terminal ³⁷²	300,000

³⁷⁰ Source: GIE Storage Map.

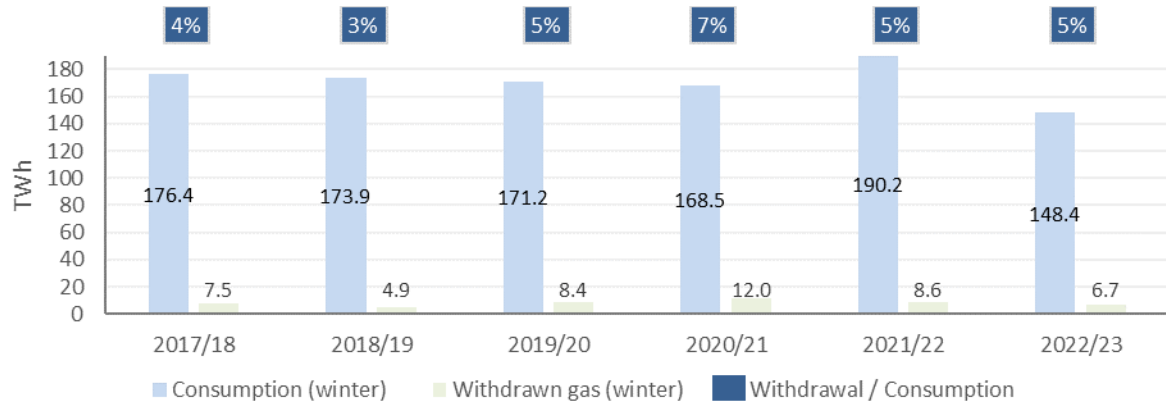
³⁷¹ Source: GIE.

³⁷² Musel entered into operation in July 2023.

Gas storage operation and filling targets

Withdrawals of gas from the Spanish underground storage facilities during the winter period (November of one year to March of the next) over the past 5 years have cover only a small share of the corresponding gas demand, ranging from 3% -7% (Figure 98).

Figure 98: Use of gas storage to cover demand in the winter season³⁷³



The filling targets and trajectories for Spain in 2022 and 2023, as established in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301, are presented in the Table below. No national targets have been set different from those in the Gas Storage Regulation.

Table 105: Targets and trajectories for Spain in 2022 and 2023³⁷⁴

2022	1 August	1 September	1 October	1 November	
	71%	74%	77%	80%	
2023	1 February	1 May	1 July	1 September	1 November
	59%	62%	78%	76%	90%

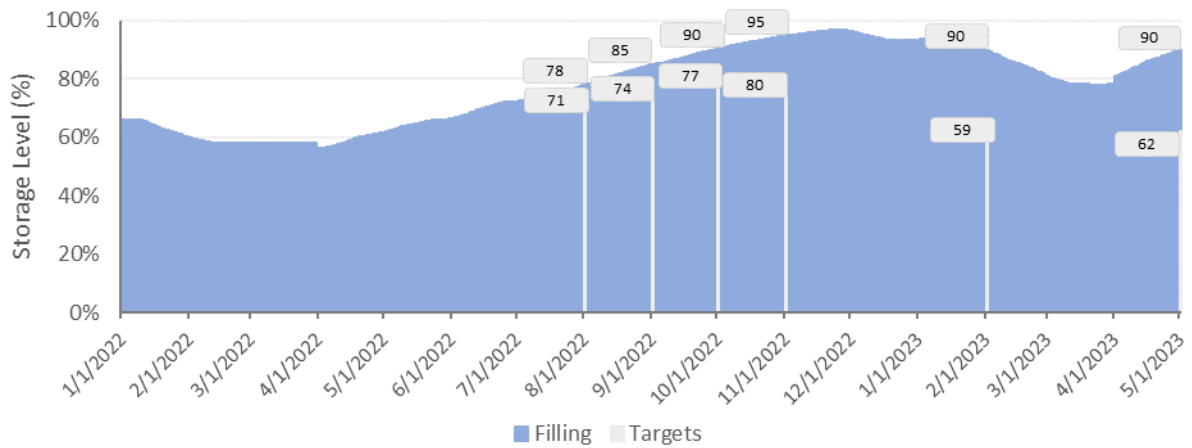
With this large LNG storage capacity, Spain satisfies the conditions laid down in Article 6a(5) of the Gas Storage Regulation, as the aggregate capacity of its LNG facilities as a share of the average annual gas consumption over the preceding five years (2017 – 2021) amounts to ca. 6%, and thus exceeds the 4% limit set by the Regulation. Although Spain satisfies the conditions laid down in Article 6a(5) of the Gas Storage Regulation, it does not make use of this clause.

Spain has succeeded in meeting the EC Gas Regulation storage filling trajectories and targets for 2022 and 2023 so far, as shown in Figure 99. Storage filling remains in fact at very high levels, being around 90%, even after the 2022/23 winter period.

³⁷³ Source: GIE (for withdrawal) and Eurostat (for consumption).

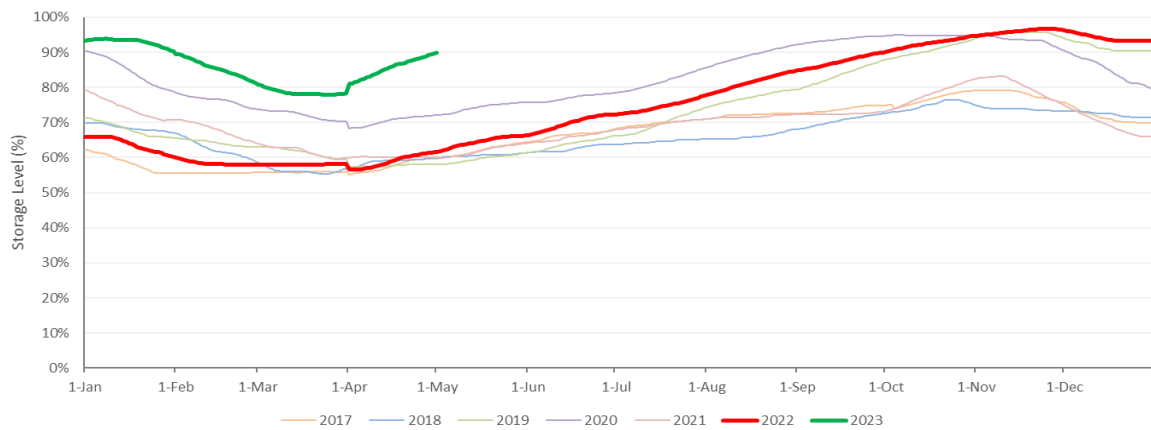
³⁷⁴ Filling trajectories and targets as stated in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301.

Figure 99: Daily gas in storage vs filling targets in 2022 and 2023³⁷⁵



In 2022, in the beginning of the winter period, the storage filling level in Spain has been at similar levels with those in 2019 and 2020, at around 95%, higher than the storage use during that period in 2021, that was slightly over 80%. In 2023 gas stock levels were higher than most of the years from 2017 to 2021 (Figure 100). It appears that measures implemented in 2022 led to achieving high filling levels in the winter period and observing an increase of gas stocks during the injection period of 2023, compared to the previous years.

Figure 100: Comparison of daily gas filling trends between 2017 until 2023



Storage tariffs at the virtual gas storage (set by the Ministry of Ecological Transition and Demographic Challenge) have changed considerably in 2023 compared to the past couple of years. Injection fees in 2023 are 2.5 times higher than the 2021/2022 gas year, while the 2023 increase for withdrawal fees is even larger, being 5 times higher than in 2021/2022 (Table 106).

Table 106: Evolution of tariffs³⁷⁶

Type of Fee	2020/2021	2021/2022	2022/2023
Storage (MWh/day)/year	3.43	3.11	2.91
Injection (MWh/day)/year	75.19	81.09	213.89
Withdrawal (MWh/day)/year	64.54	75.56	382.19

³⁷⁵ Source: GIE.

³⁷⁶ Source: Ministerial Orders establishing gas storage tariffs ([Link](#)).

Overview of national measures

The gas suppliers selling gas to Spanish final consumers and the consumers that are using the transmission network to deliver gas to their own facilities are assigned with obligations to maintain minimum gas stocks at the underground storage facilities. In 2022 these stocks corresponded to 27.5 days of their gas consumption of the previous year, out of which:

- 20 days of consumption are maintained throughout the year as gas strategic stocks and operating stocks of the system.
- 7.5 days of consumption must be maintained at least by November 1st. Storage capacity for this obligation is offered at zero storage tariff (the discount is offered until March 2024).

In 2022 there was not infringement of users’ storage obligations. As from 2023, in case a user does not meet its gas stocks obligations, the technical system manager, Enagás GTS, must undertake to cover the remaining volumes, by procuring gas and storing it on its behalf. The user compensates the technical system manager for this procurement.

The storage capacity that is not being used to maintain the gas stocks is offered via auctions to all market participants. As an incentive to maintain high storage filling levels in the winter period, the storage tariff for yearly capacity products is offered at zero reserve price if 90% of the booked capacity is in the storage on November 1st (the discount is offered until March 2024).

To compensate the SSO for the discounts offered to the storage tariffs, an amount from the state budget has been allocated to cover the corresponding costs.

The mechanism outlined above combines a number of measures from the list of Article 6b(1) of the Gas Storage Regulation:

Measure	Implementation	Relevance to Article 6b(1) measures
Gas suppliers and consumers directly supplying gas are obligated to maintain gas stocks corresponding to 27.5 days of their consumption in the previous year.	Amended in 2022	Requiring gas suppliers to store minimum volumes of gas in storage facilities, including in underground gas storage facilities and/or in LNG storage facilities, those volumes to be determined on the basis of the amount of gas supplied by gas suppliers to protected customers (point a).
Capacity for the market participants’ obligations is directly assigned, and the remaining capacity is auctioned.	Amended in 2022	Requiring storage system operators to tender their capacities to market participants (point b).
Costs of the technical system manager (Enagás GTS) are recovered from the state budget (discounts on storage tariffs) and from the market participants (gas procured and stored on their behalf).	From 2022 onwards	Providing financial incentives for market participants, including for storage system operators, such as contracts for difference, or providing compensation to market participants for the shortfall in revenues or for costs incurred by them as a result of obligations on market participants, including storage system operators which cannot be covered by revenue (point f).

Application of oversubscription and buy-back mechanism for underground storage facilities.	From 2 nd half of 2023 onwards (not yet implemented)	Requiring storage capacity holders to use or release unused booked capacities, while still obliging the storage capacity holder not using the storage capacity to pay the agreed price for the whole term of the storage contract (point g).
The gas stocks of 20 days (out of the total of 27.5 days) concern strategic reserves.	Amended in 2022	Adopting effective instruments for the purchase and management of strategic storage by public or private entities (point h).
The technical system manager (Enagás GTS) undertakes to cover the gas stocks' obligations of market participants, by procuring gas and storing it on their behalf.	From 2023 onwards	Appointing a dedicated entity tasked with meeting the filling target in the event that the filling target would not otherwise be met (point i).
Discounts to the storage tariffs are offered for market participants that meet their obligation for minimum operating stocks and for storage users that procured capacity via auctions and filled 90% of their booked capacity on November 1 st .	From 2022 to 2024 (with possibility to extend)	Providing discounts on storage tariffs (point j).

These measures are analysed in detail below.

National measures implemented due to the Gas Storage Regulation

Minimum volume in gas storage (point a of Article 6b)

Implementation of the measure

To enhance security of supply, market participants are required to maintain gas stocks commensurate to the gas consumption they serve. This measure was already in place before 2022, however Royal Decree 6/2022 amended Royal Decree 1716/2004 and increased the minimum stockholding obligations from 20 to 27.5 days of the entity's gas sales or consumption of the previous year. The amended Royal Decree 1716/2004 includes the main provisions related to the gas stockholding obligations.

The entities having obligations to establish and maintain gas stocks include:

- Natural gas suppliers, for their firm³⁷⁷ sales of gas in Spain.
- Gas consumers, in the part of their consumption that is not supplied through gas suppliers.

The 27.5 days of gas sales or consumption include:

³⁷⁷ Firm sales are sales of gas quantities via supply contracts that do not include interpretability clauses (interruptible tariff or possibility to interrupt supply for over 10 days in contracts with at least annual duration).

- 10 days of firm gas sales or consumption maintained at all times as minimum strategic security stocks. These stocks mainly concern the part of the cushion gas at the underground facilities that can be withdrawn with mechanical means and can be used in case of an emergency. The stocks may be utilized exclusively by the Government.
- 10 days of firm gas sales or consumption maintained at all times as minimum operating stocks of the system. These stocks may be utilized exclusively by the Ministry for the Ecological Transition and the Demographic Challenge. This is a less time-consuming administrative decision compared to the mobilization of the strategic security stocks by the Government, allowing these stocks to be taken out of storage more quickly if the gas is needed.
- 7.5 days of firm gas sales or consumption must be maintained at least by November 1st as minimum operating stocks of entities. This quantity corresponds to 2022. In 2023 the relevant gas volumes are calculated according to the formula presented below. These stocks may be utilized by users, as long as required filling targets are met.

The stockholding obligations of suppliers are calculated only on the basis of sales to final consumers in Spain. Transactions between gas suppliers at the wholesale market and exports to other countries are excluded from the calculations. Furthermore, interruptible sales of gas suppliers and interruptible consumption by gas consumers may be excepted from the calculation of the stockholding obligations up to a maximum of 25%. For entities starting their operations within the year, the firm sales used in the computation of the gas stocks are based on estimates, approved by the Ministry.

The stocks can be maintained in underground storage facilities owned by the obligated entity or by a third party in Spain or can be established by signing gas leasing contracts that guarantee full availability of the stocks, provided that said gas does not count in favour of another obligated entity. It is possible to use, for the purpose of maintaining the stocks, underground storage facilities in other Member States, provided that there is an intergovernmental agreement with that Member State ensuring the availability of stocks.

In accordance with Order TED/72/2023, of January 26th, 2023, the days of firm sales corresponding to the minimum operating stocks (DOU) of each user for subsequent years (an update of the 7.5 days considered in 2022) are calculated according to the following formula:

$$DOU = \frac{CAS \times F \times N}{DF} - DES - DOS$$

Where:

- CAS (MWh): Available capacity of underground storage facilities as of April 1st, including the storage capacity corresponding to the mechanically extractable cushion gas.
- F (%): Obligation of minimum storage filling, according to the Gas Storage Regulation (concerning the filling target and trajectories).
- N: Number of days of the previous calendar year.
- DF (MWh): Aggregate firm demand in the Spanish gas system for the previous calendar year.
- DEF: Obligation of minimum strategic security stocks, expressed in days.
- DOS: Obligation of minimum operating stocks of the system, expressed in days.

The Corporation for Strategic Reserves of Petroleum Products (Corporación de Reservas Estratégicas – CORES) is responsible for calculating the minimum operating stocks' obligations for each entity. The

calculation process commences in the beginning of each year, and must be concluded by February, to allow sufficient time for the technical system manager, Enagás GTS, to allocate storage capacities before the start of the storage year³⁷⁸. The timeline is presented in the Figure below. When CORES notifies the entities of their obligations, it determines their minimum strategic security stocks, minimum operating stocks of the system and minimum operating stocks of the entity for the dates of the filling trajectories and targets, as well as the parameters used for their calculation.

Figure 101: Process for determining minimum operating stocks' obligations for each entity



The storage capacity necessary for the obligated entities to store the gas stocks is allocated through an open subscription process, described below in the measure [Tender of capacities](#).

If, after applying the formula presented above, the minimum operating stock of an entity (DOU) exceeds 7.5 days of firm sales or consumption, then this entity has the right to partially comply with its stockholding obligation by storing LNG, up to a quantity corresponding to the volumes in excess of the 7.5 days (DOU-7.5), at Spain's regasification plants.

As an incentive to obligated entities, Royal Decree 6/2022 foresees as a transitory provision, that a storage fee of 0 €/kWh/day/year applies to the storage capacity necessary for maintaining the minimum operating stocks of the entity³⁷⁹. This discount is applicable only if the entity maintains 100% of its obligation in storage on November 1st, otherwise the normal storage tariff shall apply. This measure was initially applicable from April 1st, 2022, to March 31st, 2023, and was extended, with Royal Decree 20/2022, until March 31st, 2024.

If an entity is in breach of its gas stockholding obligations, a penalty applies. According to Title VI of Law 34/1998, this is considered as a very serious infraction, with a fine up to 30 mil. €. The penalty is capped to 10% of the offending entity's annual turnover.

Recovery of costs associated with implementation of the measure

The main costs associated with this measure (excluding the costs of the entities obligated to establish and maintain gas stocks) relate to the reduced revenues of the underground storage facilities' owner, due to the offering of discounts on the storage tariffs for minimum operating stocks of the entities. This revenue deficit is compensated through the State budget, with a credit provided to the Ministry for the Ecological Transition and the Demographic Challenge. This credit covers the discounts for the minimum operating stocks of the obligated entities as well as for the auctioned annual capacity (see measure [Tender of capacities](#)). The amounts for the discounts offered in 2023 and 2024 have been assigned in Royal Decree 6/2022 and Royal Decree 20/2022 respectively.

³⁷⁸ April 1st of a year to March 31st of the subsequent year.

³⁷⁹ No discount is offered for the storage capacity necessary for minimum strategic security stocks, minimum operating stocks of the system.

Monitoring and transparency

CORES is responsible for monitoring the fulfilment of the gas stockholding obligations assigned to gas suppliers and consumers. The technical system manager, Enagás GTS, supports CORES with its monitoring tasks, by providing necessary information on the gas stocks, disaggregated into minimum strategic security stocks, minimum operating stocks of the system and minimum operating stocks of the entities.

The obligated entities must send to CORES within the first five months of each year an audited accounting statement with the past year's purchases and sales of stocks (inventories on January 1st and December 31st, and monthly purchases and sales).

No information is published, by CORES or Enagás GTS, with regards to the entities stockholding obligations and whether these have been achieved.

Effects on the gas market

The market participants have expressed a concern that this measure may pose barriers to entry of new market players (no specific such cases have been identified).

Difficulties and risks with the implementation of the measure

A difficulty reported by CNMC concerns the timing of the measure's implementation, as Royal Decree 6/2022 came into force just before the start of the storage year.

The market participants consider that the application of the measure leads to an increase of logistics' costs (particularly costs for procuring gas).

Application of the measure in 2022/23

According to CORES, the entities obligated to maintain gas stocks are 262³⁸⁰. The aggregate stockholding obligations of all entities for April 2022 – March 2023 amounted to 28.3 TWh, while from April 2023 – March 2024, it is set to 30.6 TWh. Additionally, for these two periods two entities have communicated to store approx. 100 GWh of LNG to meet their obligations for operating stocks additional to the 7.5 days³⁸¹.

To compensate for the discounts on storage tariffs (both for operating stocks of entities and for auctions for yearly storage products), Royal Decree 6/2022 has allocated 21.6 mil. € from the State budget for the period April 2022 – March 2023 and Royal Decree 20/2022 23.2 mil. € for the period April 2023 – March 2024.

Tender of capacities (point b of Article 6b)

Implementation of the measure

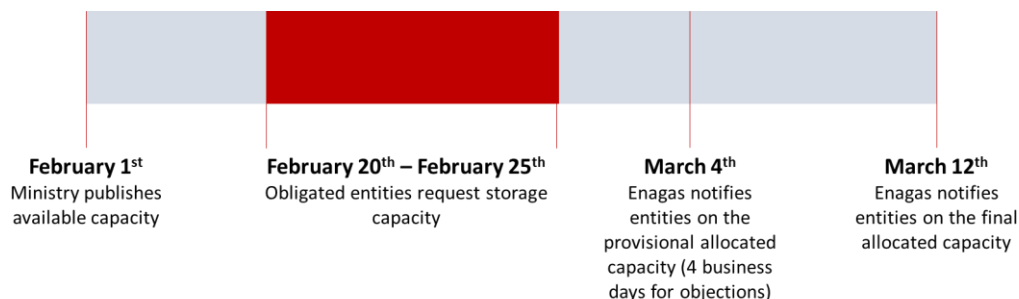
The storage capacity needed by entities with obligations to maintain gas stocks (see measure [Minimum volume in storage](#)) is allocated through an open subscription process. After the necessary capacity for gas stocks has been allocated, the remaining storage capacity is offered to users through auctions. As the storage year spans from April 1st of a year to March 31st of the subsequent year, all capacity must be allocated until March. The process for allocating capacity via the open subscription procedure is defined in Order ITC/3862/2007, that was amended by Order TED/72/2023.

³⁸⁰ Source: CORES website ([Link](#)).

³⁸¹ Source: CNMC.

For the open subscription period to be launched, the Ministry, following proposal by the technical system manager (Enagás GTS), will publish the available capacities by February 1st. Obligated entities can then request to book storage capacity between February 20th and 25th, after having been informed by CORES on their gas stocks' obligations. Enagás GTS then allocates capacity by March 12th. The capacity allocation timeline is presented in the Figure below.

Figure 102: Process for storage capacity allocation for gas stocks



The capacity still available is then awarded in an auction procedure, the main terms of which are defined in CNMC's Circular 8/2019 (the provisions of this Circular have remained unchanged until now). The storage capacity products offered are bundled (storage, injection, and withdrawal) and include:

- Yearly products, with duration for the whole storage year. Auctions for yearly products are carried out until March 20th of each year.
- Quarterly products, beginning on April 1st, July 1st, October 1st, and January 1st. Four auctions for quarterly products are carried out within a storage year, each covering the remaining quarters.
- Monthly products, with duration of one calendar month. Twelve auctions for monthly products are carried out within a storage year. Three monthly products are offered for the following three calendar months, except for the auction in January, in which the products are offered for February and March, and in the auction of February, in which only the monthly product for March is offered.
- Daily products, with duration of one gas day.
- Intraday products, from a given hour to the end of the gas day, with auctions carried out on an hourly basis.

The auctions are settled using a multi-round ascending clock algorithm, with the starting price corresponding to the storage tariff in force, unless a discount is offered. The auctions are carried out in the electronic platform of Enagás GTS, Logistics System for Third-Party Network Access (SL-ATR).

As incentives to increase the filling level of the underground storage facilities, discounts are offered in some cases:

- A zero-storage tariff applies for operating stocks of entities (DOU) if 100% of the obligation is in storage on November 1st (see measure [Minimum volume in gas storage](#)).
- A 0 €/kWh/day/year tariff (plus any premium resulting from the auction) applies for booking of yearly capacity, provided that the storage user maintains 90% of its booked capacity in storage on November 1st.

This measure was initially applicable from April 1st, 2022, to March 31st, 2023, and was extended, with Royal Decree 20/2022, until March 31st, 2024.

Recovery of costs associated with implementation of the measure

The costs associated with this measure relate to the reduced revenues of the underground storage facilities' owner, due to the offering of discounts on the annual capacity products. This revenue deficit is compensated through the credit provided to the Ministry for the Ecological Transition and the Demographic Challenge from State budget (see measure [Minimum volume in gas storage](#)).

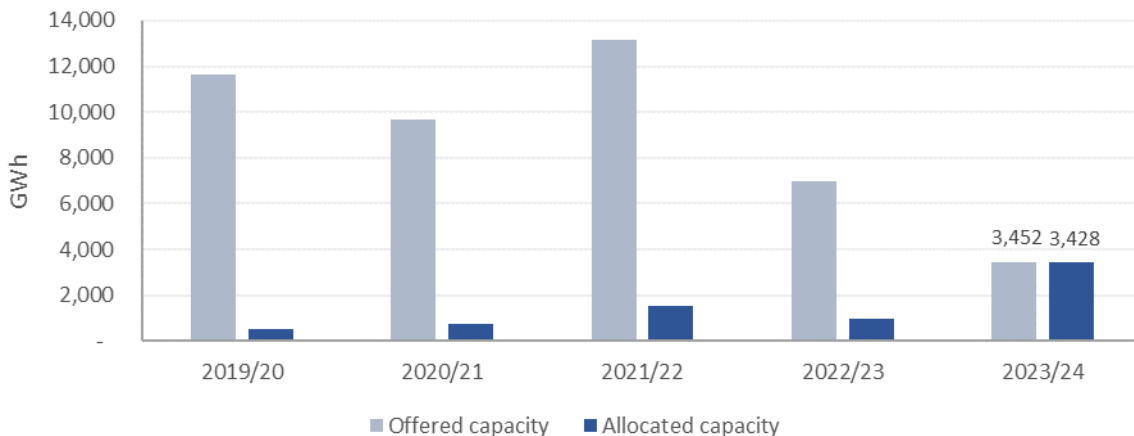
Monitoring and transparency

CNMC is the entity responsible for supervising the auction process. Enagás GTS is obligated to send to CNMC all information relevant to the implementation of auctions.

Effects on the gas market

With the incentives provided for yearly storage capacity, the market reacted showing more interest for using gas storage, increasing bookings, and producing premiums in some capacity products auctions. This is evident in the offered capacity that was booked for the yearly product April 2023 – March 2024 (Figure 103), which was offered in March 2023 and the first auction for yearly capacity that resulted in a premium (yearly product for April 2022-March 2023 was offered in March 2022, before the approval of the Regulation and therefore without the relevant incentives).

Figure 103: Booking of yearly storage capacity products³⁸²



The increasing interest for storage capacity impacted the flexibility of the gas system as a whole. Underground storages were usually used to temporarily give room in LNG storages when a vessel needed to unload at an LNG regasification terminal the tanks of which were full. Due to the limited available underground storage capacity, the TSOs needed to reduce the LNG storage capacity offered to the market.

Difficulties and risks with the implementation of the measure

No difficulties or risks with the implementation of the measure were reported.

³⁸² Source: Enagás GTS, Result of capacity allocation processes ([Link](#)).

Application of the measure in 2022/23

The allocation of storage capacity in 2022 was delayed, as Royal Decree 6/2022 entered into force on March 31st, 2022, one day before the beginning of the storage year. The capacity auction for yearly capacity 2022/23, that took place on April 6th, 2022, resulted in 14% of the offered capacity to be contracted (987 GWh). In the subsequent auction of yearly capacity, on March 21st, 2023, 99% of the capacity was booked, with the successful bids resulting in a premium of 0.0035 €/kWh/day/year.

The loss of revenues due to the discounts offered for yearly auctions, together with the discounts for operating stocks of entities are covered through the amounts allocated from the State budget, 21.6 mil. € for April 2022 – March 2023 (Royal Decree 6/2022) and 23.2 mil. € for April 2023 – March 2024 (Royal Decree 20/2022).

Financial incentives for market participants (point f of Article 6b)

As described in measures [Minimum volume in gas storage](#) and [Tender of capacities](#), the loss of revenue resulting from discounts, offered for the storing of operating stocks of entities and for yearly capacity products booked via auctions, is compensated by providing a credit to the Ministry through the State budget.

The costs that the technical system manager, Enagás GTS, may undertake to supplement the gas stocks of an entity that are in breach of their obligations, by procuring gas and storing it on its behalf, are compensated directly by the said entity (see measure [Appointment of dedicated entity](#)).

Unused booked capacities (point g of Article 6b)

Implementation of the measure

With its Resolution of March 24th, 2022, CNCM established congestion management procedures for underground storage facilities. The mechanism selected is the capacity oversubscription and buy-back (OSBB), through which any booked but unused capacity of storage users is offered to the market as oversubscription. As storage capacity is offered up to a maximum duration of one year (April – March), implementation of long-term CMPs (long-term use-it-or-lose-it) would not be efficient.

The technical system manager, Enagás GTS, calculates the additional capacity to be offered through OSBB taking into consideration the expected use of the booked capacity. The additional capacity is offered with the technical storage capacity and at the same tariff, however it is allocated only if all storage capacity has been contracted.

The buy-back procedure is preferably carried out via auctions. The maximum surcharge to be paid is 25% of the initial price. In case there are offers to meet the buy-back needs, capacity is purchased from storage users with firm capacity on a pro-rata basis and at the storage tariff.

Recovery of costs associated with implementation of the measure

The costs and revenues of the technical system manager resulting from the application of the oversubscription and buy-back mechanism will be taken into account when defining the storage tariff of the subsequent year.

Monitoring and transparency

CNMC is responsible for monitoring the application of congestion management procedures at all gas infrastructures, including the OSBB mechanism for underground storage facilities.

Enagás GTS must publish daily the average level of booked storage capacity for the past 2 months, and the total additional storage capacity offered and sold. In case the buy-back procedure is applied, Enagás GTS must publish the capacity requested, the aggregate offers from storage users and the results of the procedure.

Effects on the gas market

The congestion management procedure entered into force in the second half of 2023.

Difficulties and risks with the implementation of the measure

The congestion management procedure entered into force in the second half of 2023.

Application of the measure in 2022/23

The congestion management procedure entered into force in the second half of 2023.

Strategic storage (point h of Article 6b)

Royal Decree 1716/2004, amended by Royal Decree 6/2022, requires gas suppliers with sales in Spain, and final consumers, in the part of their consumption that is not supplied through gas suppliers, to maintain gas stocks at a minimum of 27.5 days of their firm sales or consumption of the previous year. Out of these stocks, the volumes corresponding to 20 days must be maintained by the obligated entities of the entire year:

- 10 days as minimum strategic security stocks, to be utilized exclusively by the Government.
- 10 days as minimum operating stocks of the system, to be utilized exclusively by the Ministry for the Ecological Transition and the Demographic Challenge.

Further details of these stocks are provided in measure [Minimum volume in gas storage](#).

Appointment of dedicated entity (point i of Article 6b)

Implementation of the measure

The Royal Decree 6/2022 assigns to the system technical manager, Enagás GTS, the obligation to purchase and store gas in case an entity is in breach of its obligation to maintain gas stocks. The specific obligations of the system technical manager are described in Order TED/72/2023.

For the months that a filling trajectory has been set by the Gas Storage Regulation, until the second business day of the month, Enagás GTS must inform CORES about the gas and LNG stocks of each obligated entity at the close of the first day of the month. Within 3 business days from receipt of the information, CORES notifies the obligated entities in case they are short of the required gas stocks, allowing them 2 business days to submit objections. After this period, and within 5 business days, CORES informs Enagás GTS of the entities in breach of their obligations together with the relevant gas volumes. If after 2 business days an entity continues to be in breach of its obligations, Enagás GTS proceeds with procuring from the organized market on behalf of the entity, gas volumes equal to the unfulfilled obligation, and the corresponding storage capacity, so as to store the missing gas at the underground facilities.

Recovery of costs associated with implementation of the measure

Enagás GTS is compensated directly by the entity, on behalf of which it procured and stored gas to meet its stockholding obligations. The entity is considered to be negatively imbalanced in the virtual balance storage, and accordingly has to pay the respective imbalance charges.

Monitoring and transparency

There is no specific procedure to monitor if the Enagás GTS complies with its obligation to buy gas and capacity on behalf of entities in breach of their obligations. However, Enagás GTS reports periodically to CNMC and the Ministry on the actions taken to this effect. Additionally, any storage capacity used by Enagás GTS should be reported to CNMC.

The system technical manager does not have an obligation to publish information concerning the procurement of gas volumes and the associated costs, within the frame of this measure.

Effects on the gas market

This measure has not been applied as no entities were in breach of their stockholding obligations.

Difficulties and risks with the implementation of the measure

This measure has not been applied as no entities were in breach of their stockholding obligations.

Application of the measure in 2022/23

This measure has not been applied as no entities were in breach of their stockholding obligations.

Discounts on storage tariffs (point j of Article 6b)

As described in measures [Minimum volume in gas storage](#) and [Tender of capacities](#), discounts are offered for the storing of operating stocks of entities and for yearly capacity products booked via auctions, as incentives to increase the filling level of underground storage facilities.

National measures in place prior to the Gas Storage Regulation

The measures regarding the stockholding obligations to market participants and the tendering of storage capacities were already in place before 2022 but were amended to enhance security of supply and increase the filling of storages with a view to meeting the EC Gas Storage Regulation trajectories and targets. These measures have already been described in the Section above (see [Minimum volume in gas storage](#) and [Tender of capacities](#)).

Key takeaways

- The underground storage facilities in Spain have a working volume of 34 TWh, corresponding to below 10% of the country's annual gas demand.
- Spain has succeeded in meeting the filling trajectories and targets, set in the Gas Storage Regulation (no national targets other than those in the Regulation have been set). On November 1st, 2022, the filling level was 95%.
- The injection and withdrawal tariffs (set by the Ministry of Ecological Transition and Demographic Challenge) increased significantly, being in 2022/23 2.5 times and 5 times higher, compared to the 2021/22 levels respectively.
- Some measures (stockholding obligations of market participants and tendering of storage capacity) were already in place before 2022. These were revised and additional measures were added, with Royal Decree 6/2022 and Order TED/72/2023.

- The main measure to ensure storage filling is the establishment of stockholding obligations. Suppliers with firm sales in Spain (wholesale trading and exports are excluded) and consumers, for the part of their consumption not supplied through gas suppliers, must establish, and maintain in the underground storage facilities gas stocks at a minimum corresponding to 27.5 days of their sales or consumption of the previous year. The aggregate stockholding obligations of all entities for April 2022 – March 2023 amounted to 28.3 TWh, while from April 2023 – March 2024 it is set to 30.6 TWh.
- Out of the 27.5 days, 20 days (10 days for strategic stocks and operating stocks of the system) are kept in storage throughout the year. The volumes corresponding to the remaining 7.5 days (operating stocks of the entity) must be in place on November 1st. As an incentive, the operating stocks of the entity are stored at the underground facilities a zero-storage tariff.
- The Corporation for Strategic Reserves of Petroleum Products (CORES) is responsible for monitoring gas stockholding, with support from the system technical manager, Enagás GTS. CORES and Enagás GTS do not publish any information concerning gas stocks (quantities, costs, etc.).
- In case an entity fails to meet its stockholding obligations, Enagás GTS must procure and store the missing gas volumes on behalf of the entity. The entity is considered to be negatively imbalanced in the virtual balance storage, and accordingly has to pay the respective imbalance charges. This measure has not been applied yet (no entity was in breach of its obligations).
- Storage capacity not used for maintaining gas stocks is offered to the market through auctions. As a measure to increase storage filling, storage users can book yearly storage capacity (April to March) at a zero-reserve price (plus any premium resulting from the auction), provided that they keep 90% of their booked capacity in storage on November 1st.
- CNMC is responsible for monitoring the allocation of storage capacity. Enagás GTS publishes information on the auctions carried out (volumes offered and allocated, tariffs and premia).
- The discounts offered for annual storage products has increased the demand for storage capacity. The auction carried out in March 2023 was the first at which capacity was purchased at a premium. However, as a result, the flexibility that gas storages allowed for managing the utilisation of LNG storage has decreased, leading to terminal operators offering of less LNG storage capacity.
- The discounts offered for the storing of operating stocks of entities and for yearly capacity products booked via auctions apply until March 2024 (extension of the measure is possible). The loss of revenue resulting from these discounts is compensated by providing a credit to the Ministry through the State budget. Accordingly, 21.6 mil. € were allocated for the period April 2022 – March 2023, and 23.2 mil. € for the period April 2023 – March 2024.
- To manage congestion at storages, an oversubscription and buy-back mechanism has been established by CNMC. The mechanism entered into force in the 2nd half of 2023.

Sweden

Overview

Gas storage infrastructure (August 1 st , 2023)	
Aggregate GWV	0.01 TWh
Injection capacity	6.5 GWh/d
Withdrawal capacity	8.6 GWh/d

Storage filling targets of Gas Storage Regulation and actual gas in storage					
	2022			2023	
	Target	Actual		Target	Actual
1 August	40%	91%	1 February	45%	93%
1 September	53%	91%	1 May	5%	95%
1 October	67%	93%	1 July	5%	95%
1 November	80%	93%	1 September	5%	95%
			1 November	90%	N/A

Measures applied in the MS for gas storage			
a) Minimum volume in gas storage		f) Financial incentives for market participants	
b) Tender of capacities		g) Unused booked capacities	
c1) Balancing stock managed by TSO		h) Strategic storage	
c2) Obligations imposed on designated entities		i) Appointment of dedicated entity	✓
d) Coordinated instruments		j) Discounts on storage tariffs	
e) Voluntary joint procurement mechanisms		k) Capital and operational expenditures	
Other			

Applicable legal and regulatory framework

On July 1st, 2023, the Natural Gas Act (2005:403)³⁸³ and the Security of Supply Act (2012:273)³⁸⁴ were amended, introducing obligations to entities in order to ensure compliance with the filling targets of the Gas Storage Regulation.

Furthermore, the regulatory framework requires the gas suppliers serving protected customers to store gas in the underground facility in order to comply with their obligations under the supply standard. As this obligation has been in place for several years and have not been amended to contribute to the gilling targets of the Gas Storage Regulation, it is not examined further in this Study.

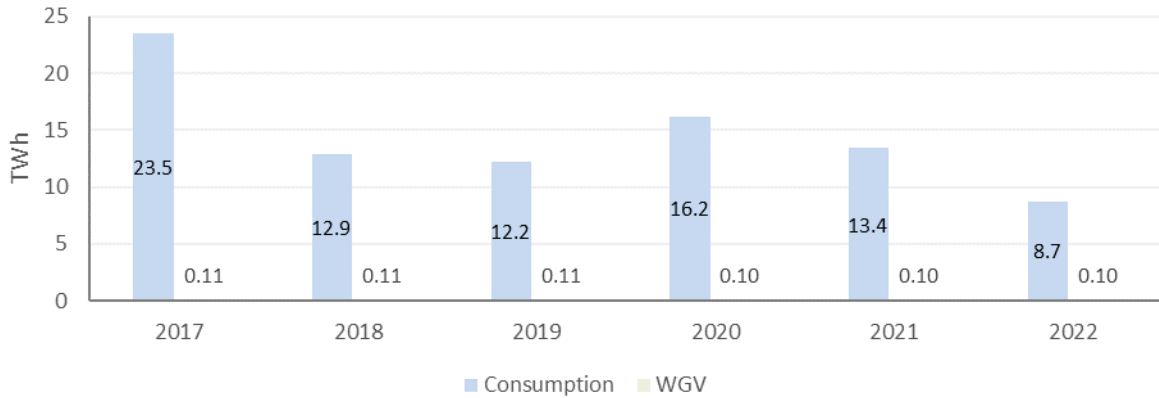
³⁸³ [Link](#) to the Natural Gas Act.

³⁸⁴ [Link](#) to the Security of Supply Act.

Gas storage infrastructure

The underground gas storage infrastructure in Sweden has a total gas working volume of 0.01 TWh, and withdrawal and injection capacity of 8.6 GWh/d and 6.5 GWh/d, respectively³⁸⁵. This storage capacity is very limited and corresponds to a very small share of gas demand (just 1% in 2022), as shown in Figure 104.

Figure 104: Storage capacity as share of the annual gas consumption from 2017 to 2022³⁸⁶



Sweden has a single underground gas storage facility (UGS Skallen), located in the southern part of the country, as shown in the map below.

Figure 105: Underground gas storage facilities in Sweden³⁸⁷



The storage facility in Sweden is operated by Swedegas. The technical characteristics of the storage facility are presented in Table 107.

Table 107: Gas storage operators and infrastructure

Name	GWV (TWh)	Injection (GWh/d)	Withdrawal (GWh/d)
UGS Skallen (Swedegas)	0.098	6.49	8.58

³⁸⁵ Source: GIE (August 1st, 2023).

³⁸⁶ Sources: GIE, Eurostat.

³⁸⁷ Source: GIE storage Map.

In addition to the underground gas storage facility, Sweden can also store gas at its LNG facilities, with aggregate storage capacity of 50,000 m³ LNG, as shown in the Table below.

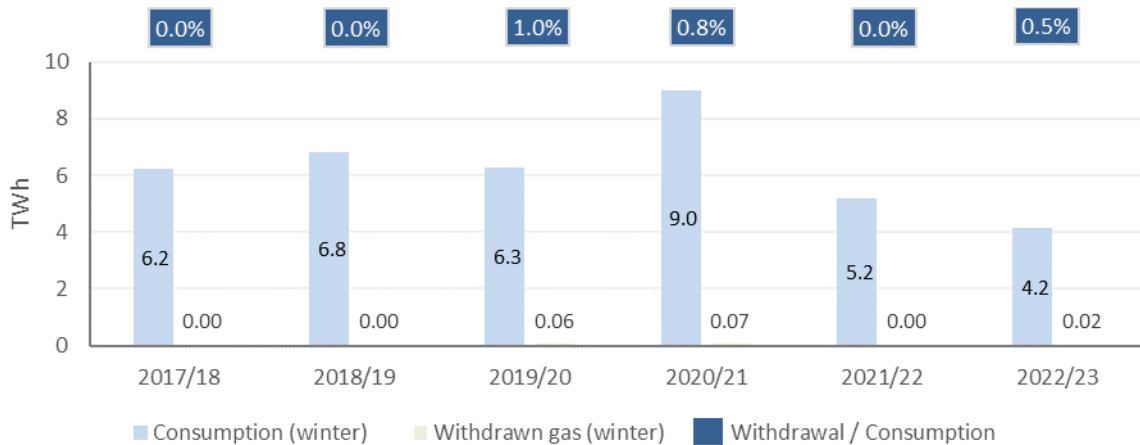
Table 108: Storage capacity at LNG facilities³⁸⁸

LNG Facilities	Storage capacity (m ³ LNG)
Lysekil LNG Terminal	30,000
Nynäshamn LNG Terminal	20,000

Gas storage operation and filling targets

As a result of the low storage capacity, the contribution of gas stored in the Swedish underground storage facility in covering gas demand during the winter period (November of one year to March of the next) has been immaterial, not exceeding 1% of consumption over the past 6 years (Figure 106).

Figure 106: Use of gas storage to cover demand in the winter season³⁸⁹



The filling targets and trajectories for Sweden in 2022 and 2023, as established in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301, are presented in the Table below. No national targets have been set, different from those in the Gas Storage Regulation.

Table 109: Targets and trajectories for Sweden in 2022 and 2023³⁹⁰

2022	1 August	1 September	1 October	1 November	
	40%	53%	67%	80%	
2023	1 February	1 May	1 July	1 September	1 November
	45%	5%	5%	5%	90%

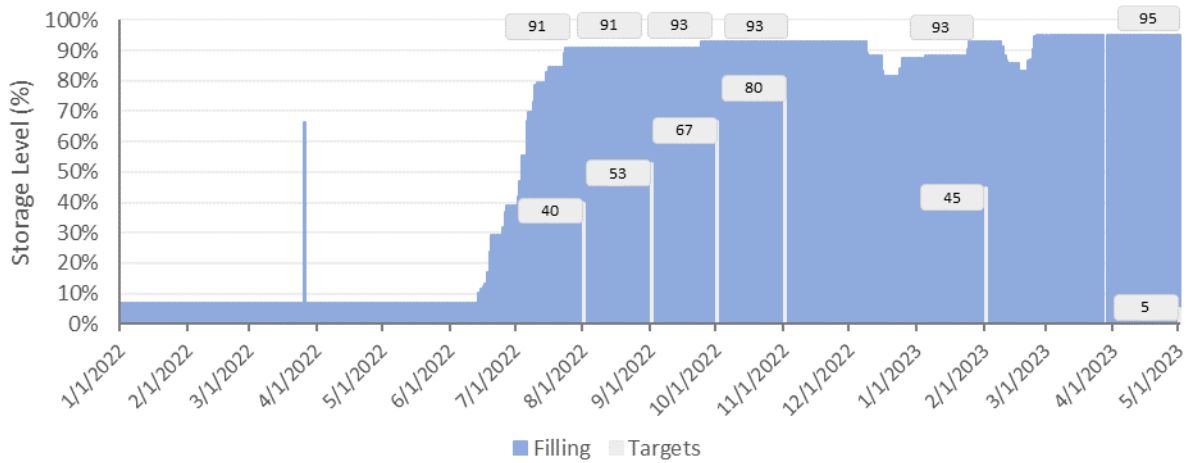
³⁸⁸ Source: Gasum.

³⁸⁹ Source: GIE (for withdrawal) and Eurostat (for consumption).

³⁹⁰ Filling trajectories and targets as stated in Annex Ia of Regulation (EU) 2022/1032 and the Annex of Commission Implementing Regulation (EU) 2022/2301.

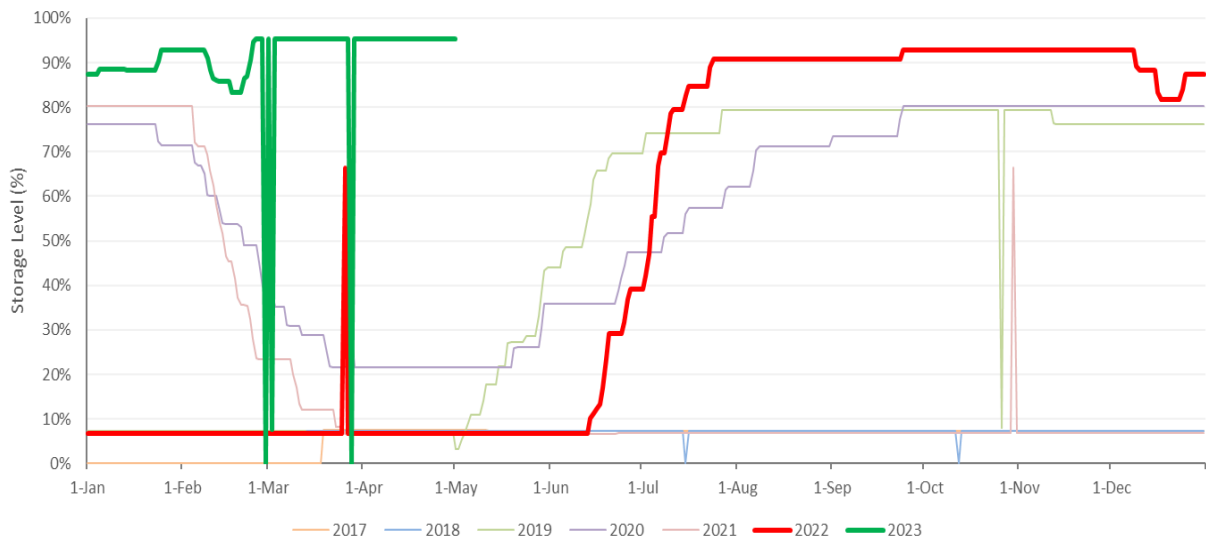
Sweden has succeeded in meeting and even exceeding the EC Gas Regulation storage filling trajectories and targets for 2022 and 2023 so far, as shown in Figure 107. Storage filling remains in fact at very high levels, exceeding 90%, even after the 2022/23 winter period.

Figure 107: Daily gas in storage vs filling targets in 2022 and 2023³⁹¹



The storage filling level in from July 2022 onwards has been higher than those over the period 2017 – 2021. In 2019 and 2020 use of storage capacity did not exceed a maximum of 80%, while in 2017, 2018 and 2021 it remained at much lower levels (Figure 108). Gas in storage remained high in 2023.

Figure 108: Comparison of daily gas filling trends between 2017 and 2023³⁹²



Overview of National measures

Amendments to the Natural Gas Act (2005:403) and the Security of Supply Act (2012:273) in July 2023 assigned to Swedegas the responsibility of ensuring that the filling level of the country’s storage facility is in accordance with the trajectories and targets of the Gas Storage Regulation, and balance administrators are tasked with storing the required gas.

³⁹¹ Source: GIE.

³⁹² Source: GIE.

The mechanism outlined above corresponds to point (i) from the list of Article 6b(1) of the Gas Storage Regulation:

Measure	Implementation	Relevance to Article 6b(1) measures
Swedegas is responsible for ensuring the filling targets are met. Balance administrators must store the necessary gas volumes at the storage facility.	July 2023	Appointing a dedicated entity tasked with meeting the filling target in the event that the filling target would not otherwise be met (point i).

This measure is analysed in detail below.

The capacity at the gas storage facility is allocated through tenders. This mechanism, however, has been in place before 2022, and was not established in order to increase storage filling, in line with the Gas Storage Regulation requirements. Therefore, this is not examined as a measure corresponding to point (b) of Article 6b(1) of the Gas Storage Regulation (tender of capacities) within the scope of this Study.

National measures implemented due to the Gas Storage Regulation

Appointment of dedicated entity (point (i) of Article 6b)

Implementation of the measure

The Security of Supply Act, with its amendments in July 2023 (§4b), assigns to Swedegas (the SSO and system balance responsible of the Swedish system) the responsibility to meet the filling targets and the filling trajectories set in the Gas Storage Regulation. The Government may issue additional regulations that exempt Swedegas from meeting the intermediary trajectories.

According to the Natural Gas Act, amended in July 2023 (§12, Chap. 7), the balance administrators³⁹³ undertake the responsibility to procure and store gas, under the instructions of Swedegas, in order to meet the filling target. Swedegas decides if the mechanism needs to be applied, depending on the progress of storage filling. If the filling targets are expected to be achieved, due to the prevailing market conditions, Swedegas does not need to oblige balance administrators to fill the storage. In case the mechanism is triggered, all the balance administrators undertake responsibilities for procuring gas, in accordance with their market share. Swedegas notifies each balance administrator concerning its obligation. The balancing administrations do not have to nominate for injection capacity, as this is assigned directly to them by Swedegas.

The terms for covering this obligation will be stipulated in the balancing agreements signed between Swedegas and each balance administrator. The specific modalities of the mechanism's application are still not set, as the balancing agreements have not been revised yet. The revised agreements are expected to enter into force in Q4 2023.

In case a balance administrator does not meet its stockholding obligations, it must pay the corresponding imbalance charges to Swedegas.

³⁹³ A balance administrators is the entity that has the financial responsibility for ensuring that the balance between gas supplied and withdrawn is maintained at the supply and offtake points covered by the said entity ([Link](#)).

Recovery of costs associated with implementation of the measure

Although Swedegas is responsible for ensuring the filling targets are met, according to the Natural Gas Act the balance administrators are financially responsible for covering the costs for storage filling (procurement of gas and storage costs). Therefore Swedegas, as system balance responsible and SSO, has not been assigned with any costs related to the measure.

Monitoring and transparency

The Energy Markets Inspectorate (Ei) is responsible for monitoring the measure's implementation. Swedegas (in its capacity as system balance responsible) is responsible for monitoring the filling level of the storage and reporting accordingly to Ei.

Swedegas is not required to publish the obligations assigned to each balance administrator for filling the storage facility. The balance administrators also do not have any obligation to publish information concerning the gas they have in storage.

Effects on the gas market

The amendments to the Law imposing the measure just entered into force in July 2023, therefore no effects on the gas market can be observed yet.

Difficulties and risks with the implementation of the measure

As the measure was put in place in July 2023, no difficulties or risks with its implementation were reported.

Application of the measure in 2022/23

The measure was introduced in July 2023. It is not having an impact on the gas filling levels of 2023/24, since storage capacity has already been sold out until April 30th, 2024, and the filling levels are already beyond the target (95% on May 1st, 2023).

National measures in place prior to the Gas Storage Regulation

No national measures were in place in Sweden prior to 2022 for using the gas storage facility for security of supply purposes.

Key takeaways

- There is only one underground storage facility in Sweden (UGS Skallen) with very small capacity of 0.1 TWh, corresponding to below 1% of annual consumption.
- Sweden has succeeded so far in meeting the filling trajectories and targets, set in the Gas Storage Regulation (no national targets other than those in the Regulation have been set). On November 1st, 2022, the filling level was 93%.
- In July 2023, the Natural Gas Act (2005:403) and the Security of Supply Act (2012:273) were amended, assigning to Swedegas (in its capacity as system balance responsible) the responsibility of ensuring that filling levels at the storage facility are in line with the Gas Storage Regulation.

- To meet its obligation, Swedegas can task balance administrators the responsibility to procure and store gas in the facility. This responsibility is allocated to each balance administrator on the basis of its market share.
- Costs for applying the measure are borne by the balance administrators.
- The Energy Markets Inspectorate is responsible for monitoring implementation of the measure.
- The measure has not been applied in practice so far, as all storage capacity has already been booked commercially until April 2024.

Annex 3: National measures at Member States without storage

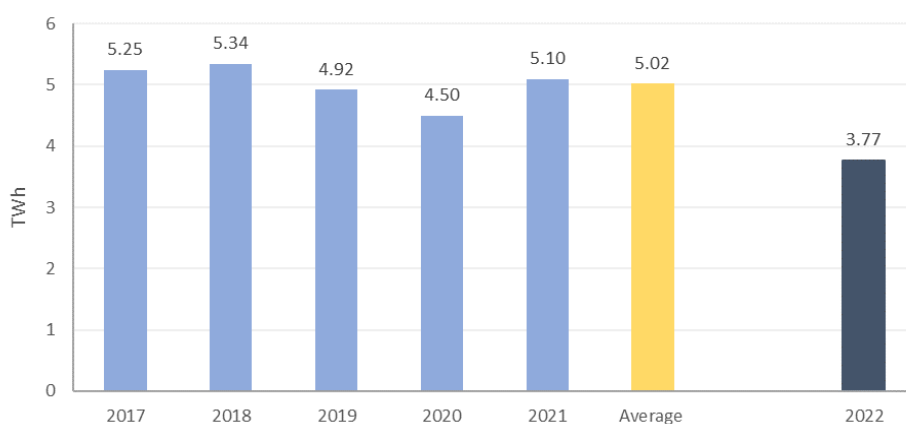
Estonia

Storage volume requirements according to Gas Storage Regulation

Estonia has no underground gas storage facilities in its territory.

Annual natural gas consumption in Estonia over the period 2017 – 2021 ranged between 4.5 and 5.3 TWh, with the average at 3.8 TWh (Figure 109). Therefore, the country's storage volume requirements, according to Article 6c of the Gas Storage Regulation amounts to 0.75 TWh (15% of the average consumption in 2017 – 2021). In 2022 gas consumption dropped by almost 25% compared to the past 5 years.

Figure 109: Gas consumption in Estonia from 2017 to 2022³⁹⁴



Actual storage volume obligations for 2022/23

Estonia did not rely on stockholding of alternative fuels to meet the storage volume obligations in 2022/23. Although the country maintains oil stocks, in accordance with the Compulsory Oil Stock Directive (Council Directive 2009/119/EC), these are not accounted for as alternative stocks within the frame of the gas storage obligations.

Gas stocks are established at the underground storage facility of Inčukalns in Latvia. There were no capacity constraints in the transmission system that could hinder the availability of Estonian gas stocks in Latvia, therefore the 15% storage volume obligation can be achieved. The strategic gas reserves that have been established (1 TWh) contribute to surpassing this obligation, as the gas stocks correspond to 26% of gas consumption in 2022.

Applicable legal and regulatory framework

The Estonian Natural Gas Act³⁹⁵ (RT I 2003, 21, 128), with an amendment in 2017, introduced gas stockholding obligations when supplying protected customers, in order to meet the supply standard set by Regulation (EU) 2017/1938. With amendments in August 2022, additional provisions were introduced concerning the strategic stocks, while in June 2023 the Act was amended to provide include additional clauses for enhancing security of supply.

³⁹⁴ Sources: Eurostat, Konkurentsiamet.

³⁹⁵ [Link](#) to the Natural Gas Act.

Furthermore, the Emergency Act³⁹⁶ (RT I, 03.03.2017, 1) includes provisions for ensuring continuity of vital services, including natural gas by establishing relevant stocks. With amendments in August 2022 and June 2023, additional provisions were included in the Act, for managing the gas stockpile and for the services considered as vital.

Measures to fulfil storage volume obligations

Two measures apply in Estonia related to the use of gas storages in neighbouring countries to strengthen security of supply:

- Establishment of gas stocks by the TSO to meet the supply standard. This measure has been in place since 2017.
- Establishment and storage of strategic stocks. This measure was implemented in 2022.

The measures are detailed below.

As additional measures, the Estonian Government is moving ahead with the development of the Paldiski LNG terminal, that is expected to be completed by the end of 2023. Furthermore, gas volumes were secured by Eesti Gaas, that signed a contract with Equinor for the purchase of 2 TWh of LNG for the upcoming heating season, to be delivered at the Lithuanian Klaipėda FSRU.

Estonia has concluded solidarity agreements with Finland and Latvia, to whose gas networks Estonia is directly connected, with a view to enhancing security of gas supply. The agreements aim to create a framework on the basis of which the parties can request and provide assistance from each other in the event of gas market disturbances, within the frame of Regulation (EU) 2017/1938.

Gas stocks for protected customers

Implementation of the measure

Articles 26⁴ to 26⁶ of the Energy Act include provisions related to the application of the supply standard. The TSO, Elering, is assigned with the responsibility to establish and maintain the stocks necessary to supply gas to protected customers³⁹⁷. These stocks can be stored at underground facilities in another EU Member State. The gas stockholding obligation of Elering is defined on a monthly basis, according to the respective needs of the protected customers. Elering may assign the procurement and storing of the required gas quantities to a third party.

The gas stocks are released in case of an emergency, if Elering, based on its analysis of the security of supply of protected customers, decides that gas deliveries to protected customers are not ensured. Elering must notify the Estonian Competition Authority on its decision. The gas stocks released are sold by Elering to gas suppliers, at the stocks' weighted average price, inclusive of transmission and storage costs. The suppliers sell the stocks to protected customers at the price that they were acquired from the TSO.

Elering has the right to sell stocks, if the level of stocks exceeds the required monthly quantity by at least 5% (unless there is an emergency situation, during which Elering is not allowed to sell its stocks in the market). The stocks must be sold at market price.

³⁹⁶ [Link](#) to the Emergency Act.

³⁹⁷ In Estonia the definition of protected customers includes households connected to the distribution network and heat producers serving dwellings that do not have the possibility of fuel switching.

Recovery of costs associated with implementation of the measure

The costs incurred by Elering for the procurement and storing of gas stocks, to meet the supply standard, are recovered from the transmission tariffs charged to the system users. When Elering sells the gas stocks to suppliers, the price is set equal to the weighted acquisition price to which the costs of storing, managing and transit have been added.

Monitoring and transparency

The Estonian Competition Authority is responsible for verifying that Elering has established the stocks, is replenishing them and complies with the gas quality requirements. Elering must notify the Estonian Competition Authority in case it decides that the gas stocks will be used to supply protected customers in a crisis situation, providing the following information:

- The reason for releasing the stocks.
- The number of days of the supply disruption during which the stocks will be used.
- The actions to be undertaken by Elering to replenish the stocks.
- The quantity of stocks released.

Elering publishes on its website information related to the purchase of gas stocks (quantity and costs). In case Elering releases gas stocks, it must publish the relevant decision on its website.

Application of the measure in 2022/23

In 2022, from October to November, the maximum amount of gas stocks for protected consumers amounted to 129.2 GWh/month, which was stored by Elering at the Inčukalna UGS.

Emergency reserves

Implementation of the measure

The Estonian Stockpiling Agency (ESPA) is responsible for stockpiling vital goods, including natural gas and managing their use in case of emergencies. The activities of ESPA are determined in the Emergency Act. Stockpiling of natural gas (strategic stocks) began in 2022, to meet the obligations of the Gas Storage Regulation.

The volumes of gas to be established by ESPA are defined by an order of the Government and are established at the Inčukalna UGS in Latvia. To establish the required level of stocks, ESPA carries out public tenders. Release of the strategic stocks is decided by the Government.

Recovery of costs associated with implementation of the measure

The costs for strategic stocks include the costs for keeping the stocks, insurance of the stocks, costs for verifying the stocks, operating, and financing stocks of ESPA.

ESPA is compensated for its costs associated with the establishment and management of stocks through a gas reserve payment. All final gas consumers must pay the reserve payment, which is collected by the network operators and forwarded to ESPA. The reserve payment (in €/MWh) is established by the Minister of Economy and Infrastructure, after proposal by ESPA. The reserve payment is set on the basis of the expected costs for the amount of gas reserved for the next calendar year and may range from 0.1 to 2.5 €/MWh.

Monitoring and transparency

The Ministry of Economy and Infrastructure is responsible for monitoring this measure.

ESPA publishes on its website its obligations for establishing the strategic stocks (quantities, storage at which it is stored) while the payment rate is published in a Regulation of the Minister of Economy and Infrastructure.

Difficulties and risks with the implementation of the measure

ESPA faced difficulties in securing the gas quantities required in 2022. The two initial procurements resulted in only securing one fifth of the target, and ESPA had to conduct a third procurement to establish the full quantities.

Application of the measure in 2022/23

In 2022 the Government required ESPA to procure 1 TWh³⁹⁸ of strategic gas stocks and store them at the Inčukalns UGS in Latvia. These required volumes correspond to 20% of the average consumption of the period 2017 – 2021, exceeding the 15% target of the Gas Storage Regulation. With the decrease of demand in 2022, the strategic stocks correspond to 26.5% of that year.

The payment rate for the strategic stocks, valid from May 1st, 2023, was set by the Minister of Economy and Infrastructure at 0.4 €/MWh³⁹⁹.

Key takeaways

- Estonia's storage volume requirement, according to the Gas Storage Regulation, amounts to 0.75 TWh.
- To meet the target, the Estonian Stockpiling Agency (ESPA) was tasked by the Government to establish in 2022 strategic gas stocks of 1 TWh and store them at the Inčukalns UGS in Latvia.
- The Natural Gas Act was amended in 2022, to introduce provisions for the recovery of ESPA's costs. The TSO, Elering, is responsible for paying ESPA for its costs incurred due to the establishment of strategic stocks. The payment rate for 2023 is set at 0.4 €/MWh.
- Monitoring of the strategic stocks is carried out by the Ministry of Economy and Infrastructure. ESPA publishes on its website information related to the establishment of the stocks.
- An additional measure to increase the country's stocks is the obligation of Elering to maintain gas stocks corresponding to the gas needs of the protected customers, in line with the supply standard. Elering maintains these stocks at the Inčukalns UGS. In the winter 2022, the stored gas amounted to 129.2 GWh/month. In case of an emergency, Elering sells the stocks to suppliers, at a price corresponding to the costs for establishing and maintaining them. The suppliers must sell the stocks to the protected customers, at the price they acquired them.
- The Estonian Competition Authority is responsible for monitoring Elering's responsibilities related to the gas stocks. Elering publishes on its website information regarding the procurement of gas quantities to meet its obligations.

³⁹⁸ Source: ESPA – Size and location of the gas reserve ([Link](#)).

³⁹⁹ Regulation of the Minister of Economy and Infrastructure on the establishment of reserve payment for gas reserves ([Link](#)).

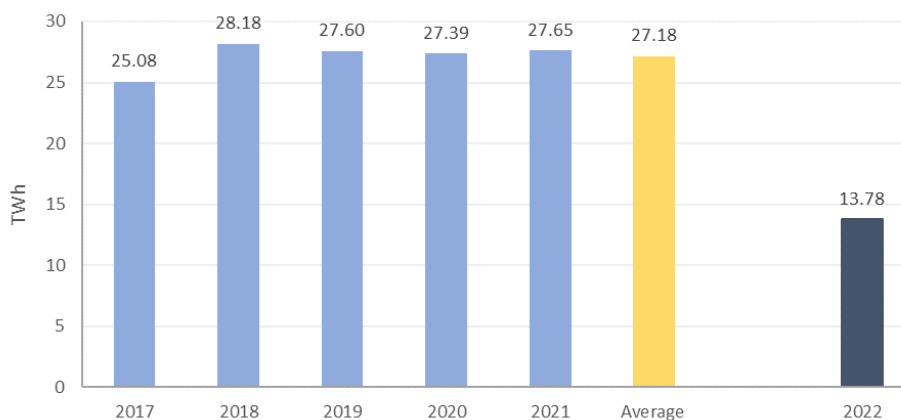
Finland

Storage volume requirements according to Gas Storage Regulation

Finland has no underground gas storage facilities in its territory.

Annual natural gas consumption in Finland over the period 2017 – 2021 ranged between 25 and 28 TWh, with the average at 27.2 TWh (Figure 110). In 2022 gas consumption dropped by 50% compared to the past 5 years.

Figure 110: Gas consumption in Finland from 2017 to 2022⁴⁰⁰



Due to limitations in the interconnection of Finland with the rest of EU, the country's storage volume requirements for 2022 and 2023 were set to 0.96 TWh and 1.18 TWh respectively. This target corresponds to the average gas volumes stored in the Inčukalns UGS in Latvia over the past five years (applicable after 2019, as until then Finland was not connected to other EU Member States).

Stocks are maintained only at the Latvian underground storage facility, due to its proximity to Finland.

Applicable legal and regulatory framework

The Act on compulsory storage of imported fuels⁴⁰¹ (28.11.1994/1070), amended in February 2023, together with the Decree on compulsory storage of imported fuels (28.11.1994/1071)⁴⁰² set responsibilities for establishing and maintaining obligatory stocks for imported fuels, including natural gas.

Measures to fulfil storage volume obligations

In accordance with the Act on compulsory storage of imported fuels, gas market participants undertake to establish and maintain gas stocks. The measure was initially put in place in 2021, and was amended in 2023, increasing the level of stocks, to ensure that the obligations foreseen in the Gas Storage Regulation can be met.

⁴⁰⁰ Source: Eurostat.

⁴⁰¹ [Link](#) to the Act on compulsory storage of imported fuels.

⁴⁰² [Link](#) to the Decree on compulsory storage of imported fuels.

The National Emergency Supply Agency (NESA), which is responsible for managing and monitoring the gas stockholding, may allow part of the market participants' obligation to be stored as an alternative fuel in Finland.

Mandatory gas stocks by market participants

Implementation of the measure

Chapter 4 of the Act on compulsory storage of imported fuels requires market participants to store natural gas. The entities undertaking this responsibility are gas suppliers, final consumers connected to the transmission system, electricity producers using LNG as feedstock, and suppliers of gas or LNG as transport fuel.

The obligated entities must maintain two types of gas stocks:

- Mandatory stocks that correspond to one quarter of their gas sales or consumption of the previous year, starting from July 1st of each year. This obligation was set with an amendment to the Act in 2021 and applies permanently.
- Additional storage obligations, which are necessary to meet the obligation set for Finland by the Gas Storage Regulation. This storage obligation is allocated to each entity proportionately to its average gas sales or consumption, corresponding to the years used to calculate the storage obligation for Finland. The additional storage obligations must be established by November 1st of each year. This requirement was set with amendment to the Act in 2023 and applies from 2023 to December 31st, 2025.

The gas stocks to be established by each obligated entity are determined by NESA, on an annual basis, using information provided by the entities. The additional storage obligations are determined by NESA by April 30th of each year. NESA determined the location at which the gas stocks will be stored, either in Finland or in another country with which Finland has an agreement for cooperating in the field of security of supply.

Upon application by an obligated entity, NESA may confirm that the obligation to store natural gas can be fulfilled by storing an alternative fuel ensuring however that the same level of security of energy supply is maintained.

The obligated entities may use the gas stored under the additional storage obligations during the period from November 1st of each year to April 30th of the next year.

Any entity not meeting its obligations is subject to a penalty, in accordance with the Finish legislative framework.

Recovery of costs associated with implementation of the measure

There is no mechanism in place through which the obligated entities recover their costs for establishing and maintaining gas stocks. Each entity recovers its costs as part of the prices charged to its customers.

Monitoring and transparency

NESA is responsible for monitoring implementation of the measure and to annually confirm the level of gas stocks. The obligated entities must provide information to NESA, concerning the stored gas. They must also inform NESA of any withdrawals of gas stored as additional storage obligations.

Application of the measure in 2022/23

According to NESAs, in 2022 the level of gas stocks maintained by Finnish market participants in the Inčukalns UGS in Latvia amounted to 1.11 TWh.

Key takeaways

- Finland's gas storage requirement is set to 0.96 TWh for 2022 and 1.18 TWh for 2023, due to constraints in the country's interconnections with other EU Member States.
- The obligation to maintain gas stocks is assigned to market participants (gas suppliers, final consumers connected to the transmission system, power producers using LNG and providers of CNG/LNG for transport).
- The stocks include mandatory stocks, corresponding to the entity's quarterly gas sales / consumption, and additional storage obligations, which are necessary to meet the obligation set for Finland by the Gas Storage Regulation. The gas stockholding obligation of each entity is determined by National Emergency Supply Agency (NESAs). NESAs are also responsible for monitoring implementation of the measure.
- All gas stocks are stored in the Inčukalns UGS in Latvia. In 2022 the stocks amounted to 1.11 TWh.

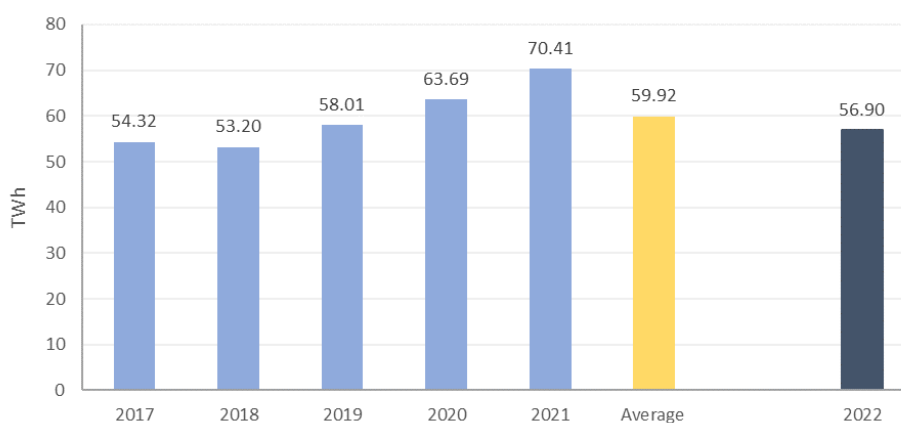
Greece

Storage volume requirements according to Gas Storage Regulation

Greece has no underground gas storage facilities in its territory.

Annual natural gas consumption in Greece over the period 2017 – 2021 ranged between 55 and 70 TWh, with the average at 60 TWh (Figure 111). Therefore, the country's storage volume requirements, according to Article 6c of the Gas Storage Regulation amounts to 9 TWh (15% of the average consumption in 2017 – 2021). In 2022 gas consumption dropped slightly, 5%, compared to the average of the past 5 years.

Figure 111: Gas consumption in Greece from 2017 to 2022⁴⁰³



Greece has not set in its legislation a target for maintaining gas in underground storage facilities in neighbouring countries different than the one foreseen in the Gas Storage Regulation.

Actual storage volume obligations for 2022/23

Capacity constraints at the interconnection between Greece and Italy result in limitations to the amount of gas that can be stored at the Italian underground facilities and can be made available to the Greek system. The IP Nea Mesimvria, connecting the Greek national transmission system with the Trans-Adriatic Pipeline, has a maximum daily capacity of 7.522 GWh/d, which for the winter period (150 days) can supply a maximum gas volume of 1.14 TWh. For this reason, the Regulatory Authority for Energy (RAE) caps the stockholding obligations of market participants to 1.14 TWh, instead of the target of 9 TWh.

Market participants were also required to store alternative fuels to contribute to the stockholding obligation, as foreseen in Article 6c(1) of the Regulation. Specifically, holders of a natural gas-fired electricity generation license have the obligation to ensure the uninterrupted operation of their plant in the event of a disruption of natural gas supply for a specified period of time. To this end, a specific condition has been introduced in their generation licenses, according to which some generators are obligated to maintain a reserve of alternative fuel (diesel) and to ensure that their plants are ready to operate with it (dual-fuel plant), while other generators are obligated to maintain a reserve of natural gas. In 2022, the electricity producers were required to increase their reserve from 5 days to 20 days

⁴⁰³ Source: Eurostat.

or up to the maximum storage capacity of their existing tanks, if less. The equivalent total quantity of the alternative fuel (diesel) reserve corresponds to approximately 1.2 TWh of gas.

For 2023/24, almost the entire annual entry capacity at the Nea Mesimvria entry point has already been booked at the last auctions with very high premiums, making it practically impossible to maintain gas stocks in Italy and then being able to transfer them to Greece for the needs of the Greek energy market. Furthermore, both in Italy and Bulgaria it appears that the storage capacities are booked.

Applicable legal and regulatory framework

According to Article 73 of the Greek Energy Law (4001/2011)⁴⁰⁴, the TSO, DESFA, has undertaken the responsibility of compensating the entities involved with strengthening the country's gas security of supply (including obligation of electricity producers to maintain stocks of LNG and alternative fuels, supply contracts with demand side management measures, etc.). DESFA recovers its costs through a security of supply levy collected from gas consumers. With an amendment to the Law in March 2023, additional provisions for this levy were introduced.

In order to comply with the gas storage obligations, set by the Gas Storage Regulation, the Preventive Action Plan approved by RAE (Decision 792/2022)⁴⁰⁵ in October 2022 included obligations for stockholding in neighbouring countries.

Measures to fulfil storage volume obligations

Compliance of Greece with gas storage obligations is framed by Article 6c(3) of the Gas Storage Regulation: *“As a transitional measure, Member States without underground gas storage facilities, but which have underground gas storage facilities included in the last list of projects of common interest referred to in Regulation (EU) 2022/869 of the European Parliament and of the Council (*3) may partially comply with paragraph 1 by counting LNG stocks in existing floating storage units, until their underground gas storage facilities are in operation”*. Therefore, during the winter of 2022/23, gas volumes were stored in the FSU, which was adjacent to the LNG Terminal of Revythoussa.

The only measure put in place in Greece for ensuring that the storage volume obligation is fulfilled, is the enforcement on gas suppliers in the country to store gas in Italy for the period November 1st, 2022, to March 31st, 2023.

The Greek and Italian Governments signed a Memorandum of Understanding “On cooperation in the security of gas supply and gas storage”, on the basis of the Gas Storage Regulation (the documents are confidential).

Furthermore, the main measure put in place in Greece for ensuring that the storage volume obligation is fulfilled, is the enforcement on gas suppliers in the country to store the quantity of 1.14 TWh of gas in neighbouring Member States (Italy and Bulgaria) for the period November 1st, 2022, to March 31st, 2023. For the fulfilment of the above obligation, Greece signed Memoranda of Understanding with Bulgaria and Italy in order to maintain a reserve in their underground storage facilities, on the basis of the Gas Storage Regulation.

⁴⁰⁴ [Link](#) to the Energy Law.

⁴⁰⁵ [Link](#) to Decision 792/2022.

Gas stocks for protected customers

Implementation of the measure

One of the measures included in the Preventive Action Plan of 2022, introduced obligations to the participants of the Greek gas market to establish and maintain gas stocks in the underground storage facilities of neighbouring Member States. This measure aimed to fulfil the storage volume obligation set for Greece, up to the maximum possible volume allowed by the limited entry capacity from the Italian to the Greek gas system (through the Trans-Adriatic Pipeline), i.e., 1.14 TWh.

The obligation to store was assigned to suppliers that have imported more than 1% of gas supplied to the Greek market over the last 5 years (6 suppliers in total). The obligation of each supplier was calculated as a weighted average of its imported gas volumes from 2017 – 2021, applied to the total required storage amount (1.14 GWh). Suppliers were obligated to store the required quantity of gas until November 1st, 2022, and then they had to transfer it to Greece with a stable daily withdrawal rate (i.e., 7.5 GWh/d). The gas was made available to the Greek market through the natural gas Trading Platform. Exceptionally, after submitting relevant information and documentation, the gas suppliers were given the opportunity to complete the injection of natural gas by November 30th, 2022, provided that by November 1st they would have injected a sufficient quantity to fulfil their obligation for the delivery of the predicted daily quantity as early as November 1st, 2022.

The suppliers were given the opportunity to decide either to buy the gas in Greece and transport it to the neighbouring Member State or buy gas at the neighbouring Member State's market.

In case a supplier did not meet its obligations, the Authority could impose a fine up to 10% of the company's annual turnover.

Recovery of costs associated with implementation of the measure

The gas suppliers are compensated for their costs related to the transportation and storage of gas by DESFA. The TSO recovers these costs from a security of supply levy⁴⁰⁶, that is imposed on the gas consumers (the levy is higher for protected customers and electricity producers).

According to RAE's Decision no 888/2022⁴⁰⁷, the total costs for which the suppliers are reimbursed include:

- Costs for transporting (if required) gas from the national transmission system to the underground storage facility of the other Member States.
- Costs for using the underground storage facility.
- Costs for withdrawing gas from the storage facility and its entry into the national transmission system.
- Capital cost of maintaining the natural gas stocks for a period of time from the date of its procurement until the date of its injection into the national transmission system (for a maximum of 8 months), taking into consideration the cost at which gas was procured and annual cost of debt of 4% (based on the cost of borrowing for new short-term loans in Greece), as well as capital costs for the amounts allocated by the liable suppliers for the commitment of transport capacity and storage capacity.

⁴⁰⁶ Apart from the costs related to the establishment of costs, the levy also includes costs related to other security of supply activities, such as compensation to electricity producers for maintaining oil stocks.

⁴⁰⁷ [Link](#) to Decision 888/2022.

The cost of gas supply is not reimbursed as it could have been used by liable suppliers during the winter season. However, suppliers could also opt to sign a two-way contract for differences with DESFA, to cover the costs of negative summer-winter spreads. The reference price is the market price at which gas was allocated to the trading platform or, in case it was not allocated, the closing price of the trading platform of that day, while the strike price is defined by RAE. The strike price includes the cost of capital (for a maximum of 8 months), that is determined on the basis of the cost of borrowing for new short-term loans in Greece.

According to the ex-post data now available to the NRA and to Decision E-81/2023⁴⁰⁸, the cost of the above measure amounted to approximately €127 million.

Monitoring and transparency

DESFA was responsible for monitoring of the implementation of the measure and had to collect the necessary information from the suppliers to ensure that they are compliant. DESFA had to inform RAE in case a supplier had not met its gas stockholding obligations.

Difficulties and risks with the implementation of this measure

According to the NRA, the main drawback of this measure is the excessive level of the cost implicated. Namely, the cost for this measure accounted for the 80% (127 mil. €) of the total cost of all actions foreseen in the 2022 Preventive Action Plan (total sum: 160 mil. €). The cost of 2022 Plan was at least 22 times higher than the cost of the previous Preventive Action Plans. This entailed a new and extremely high charge to be borne by the consumers.

Furthermore, the usefulness of the measure remains disputable and dubious given the technical constraints related to storing gas in neighbouring countries (storage capacity and capacity at the cross-border IPs). Therefore, in the event of a supply crisis, the importation of the stored quantity of natural gas could be proved not feasible.

Application of the measure in 2022/23

The gas suppliers stored, from November 2022 to March 2023, 1.14 TWh, which was released and delivered to the Greek trading platform at a steady daily rate of 7.522 GWh/d (for a period of 150 days). Furthermore, gas-fired power plants were obligated to store a total quantity of 0.570 TWh of natural gas in the Floating Storage Unit, which was operational at Revythoussa LNG Terminal.

Key takeaways

- Gas storage obligation for Greece was set to 1.14 TWh for 2022, due to limitations at the cross-border capacity with neighbouring Member States (Italy, Bulgaria).
- As a temporary measure, gas volumes were stored in the FSU, which was adjacent to the LNG Terminal of Revythoussa. Furthermore, market participants with significant share (more than 1% of gas supplied to the Greek market over the last 5 years) were required to store 1.14 TWh of gas in the neighbouring Member States by November 1st, 2022, which was released to the Greek system at a steady daily rate until the end of March 2023.

⁴⁰⁸ [Link](#) to Decision E-81/2023.

- Costs for using storage and transmission capacity, as well as financing costs are recovered through a security of supply levy, imposed to final gas consumers.
- The cost of gas supply is not reimbursed, however, suppliers could opt to sign a two-way contract for differences with the TSO, DESFA, to cover the costs of negative summer-winter spreads. All suppliers obligated to store gas signed such CfDs.
- To facilitate storing gas in the neighbouring countries, Greece signed MoUs with Italy and Bulgaria.

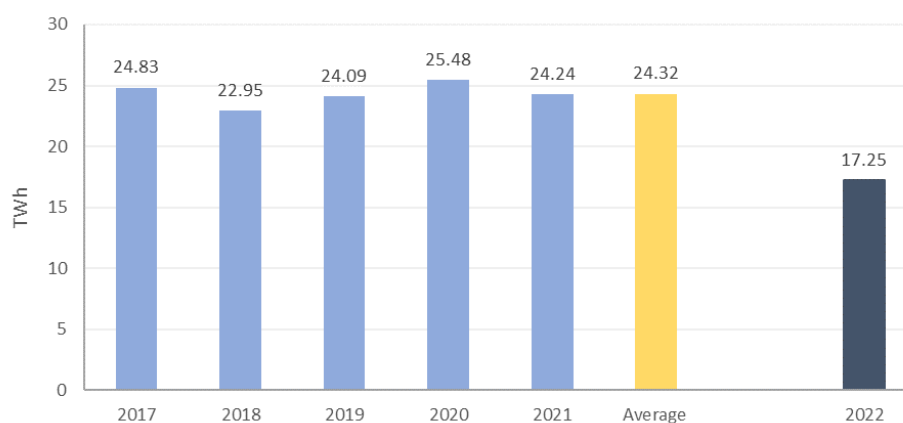
Lithuania

Storage volume requirements according to Gas Storage Regulation

Lithuania has no underground gas storage facilities in its territory.

Annual natural gas consumption in Lithuania over the period 2017 – 2021 ranged between 23 and 25.5 TWh, with the average at 24.3 TWh (Figure 112). Therefore, the country's storage volume requirements, according to Article 6c of the Gas Storage Regulation amounts to 3.65 TWh (15% of the average consumption in 2017 – 2021). In 2022 gas consumption dropped by almost 30% compared to the past 5 years.

Figure 112: Gas consumption in Lithuania from 2017 to 2022⁴⁰⁹



Actual storage volume obligations for 2022/23

Lithuania did not rely on stockholding of alternative fuels to meet the storage volume obligations in 2022/23.

The conditions set out in Article 6c(5) of the Gas Storage Regulation are met in the case of Lithuania, as the neighbouring Inčukalns UGS in Latvia has larger capacity than the Latvian annual gas consumption, and Lithuania has access to that facility. In accordance with Article 6c(5), Lithuania must ensure that by 1 November of each year the stored volumes correspond at least to the average usage of the storage capacity over the preceding five years, which for 2022 corresponds to ca. 1.5 TWh.

Applicable legal and regulatory framework

No amendments were made in the Lithuanian legislative framework in order to meet the storage volume obligations of the Gas Storage Regulation. The Lithuanian Law on Natural Gas⁴¹⁰ (VIII-1973) already included obligations to market participants, for maintaining gas stocks for protected customers, in order to meet the supply standard.

⁴⁰⁹ Source: Eurostat.

⁴¹⁰ [Link](#) to the Law on Natural Gas.

Measures to fulfil storage volume obligations

No additional security of supply measures were implemented in Lithuania in 2022, in order to meet the storage volume obligation, set by the Gas Storage Regulation. The obligations set to market participants to establish and maintain gas stocks for security of supply, in accordance with the Law on Natural Gas, provide sufficient volumes to comply with the storage obligations.

The entities responsible for establishing gas stocks are:

- Gas suppliers that supply protected customers⁴¹¹. The volumes of the gas stocks are defined by the Government, based on the gas needs of the protected customers.
- Gas-fired electricity producers that cannot use alternative fuels. The volumes of the gas stocks correspond to their monthly natural gas needs.

The gas stocks may be stored at underground gas storages of Member States interconnected with Lithuania. The gas stocks can be used to meet the gas needs in case of emergency situations.

The costs incurred by each obligated entity are recovered from its customers (included in its end-user prices).

The Ministry of Energy is responsible for monitoring the implementation of the measure.

In 2022, the entities with obligation to maintain stocks kept in the Inčukalns UGS the following gas quantities (as of August 31st, 2022):

- Stocks for protected customers: 0.5 TWh
- Stocks of electricity producers: 1.06 TWh
- Stocks for commercial purposes: 0.89 TWh

Similar gas quantities are being maintained in the storage facility in 2023.

⁴¹¹ In Estonia the definition of protected customers includes households, and non-household customers consuming up to 20,000 m³.

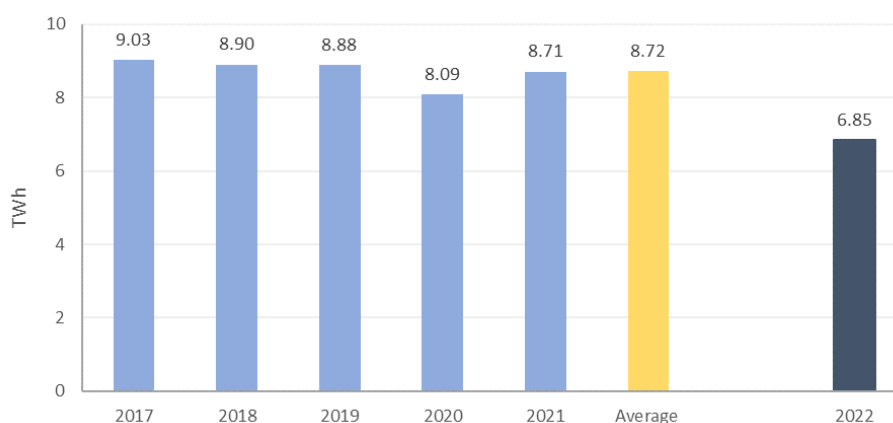
Luxembourg

Storage volume requirements according to Gas Storage Regulation

Luxembourg has no underground gas storage facilities in its territory.

Annual natural gas consumption in Luxembourg over the period 2017 – 2021 ranged between 8 and 9 TWh, with the average at 8.72 TWh (Figure 113). Therefore, the country's storage volume requirements, according to Article 6c of the Gas Storage Regulation amounts to 1.31 TWh (15% of the average consumption in 2017 – 2021). In 2022 gas consumption dropped by 20% compared to the past 5 years.

Figure 113: Gas consumption in Luxembourg from 2017 to 2022⁴¹²



Actual storage volume obligations for 2022/23

Luxembourg did not rely on stockholding of alternative fuels to meet the storage volume obligations in 2022/23.

There are no restrictions in interconnection capacity limiting the possibility to store gas in neighbouring countries. In 2022, 1.3 TWh were stored, of which 913 GWh in German underground storage facilities, and 393 GWh in the French ones. No data is available for 2023 so far.

Measures to fulfil storage volume obligations

In 2022 storing of gas by market participants in neighbouring countries was carried out on a voluntary basis.

In July 2023, the Law relating to the organization of the natural gas market, of August 1st, 2007, was amended⁴¹³, introducing to market participants the obligation to maintain gas stocks in neighbouring Member States.

In particular, each gas supplier must enter into agreements with SSOs in Member States or with other players in the European Union market, with a view to using gas stored in underground storage facilities, no later than November 1st of each year. The volumes stored by each supplier must

⁴¹² Source: Eurostat

⁴¹³ Article 45(4) of the Law of June 9th, 2023 ([Link](#))

correspond to at least 15% of the average annual gas sales of the respective supplier over the past five years from this supplier to its end customers in Luxembourg.

Each supplier must recover its costs from its final consumers, as there is no cost recovery mechanism foreseen by Law.

The Ministry of Energy & Spatial Planning is responsible for monitoring the measure's implementation. To this end, each supplier must submit to the Ministry, by November 1st of each year, the annual volumes of the last five years of its gas sales in Luxembourg, and the volumes of gas which will be stored in European underground storage facilities, in accordance with relevant agreements signed by the supplier with SSOs or other market participants.

In case a supplier does not meet its stockholding obligations, the Ministry may decide to penalize it with a fine between 10 and 35 €/MWh of gas short from its obligation.

There is no information on the gas volumes stored in 2023, as a result of the measure's implementation.

Luxembourg has not signed a burden sharing agreement with another Member State.

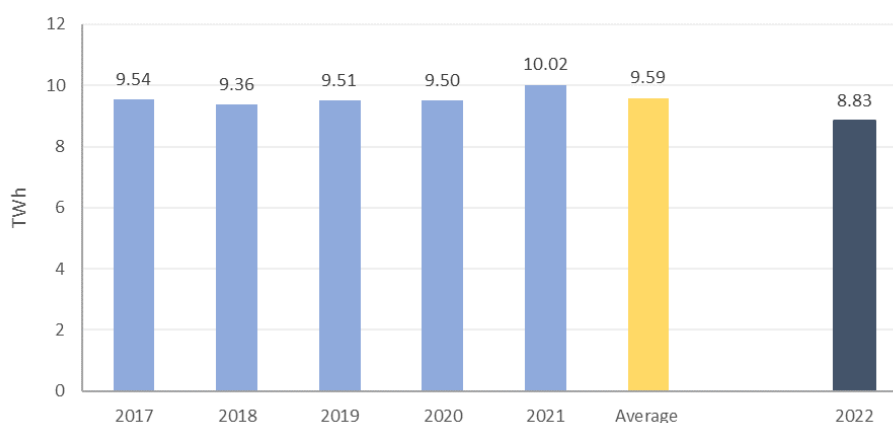
Slovenia

Storage volume requirements according to Gas Storage Regulation

Slovenia has no underground gas storage facilities in its territory.

Annual natural gas consumption in Slovenia over the period 2017 – 2021 ranged between 9.5 and 10 TWh, with the average at 9.59 TWh (Figure 114). Therefore, the country's storage volume requirements, according to Article 6c of the Gas Storage Regulation amounts to 1.44 TWh (15% of the average consumption in 2017 – 2021). In 2022 gas consumption dropped by 8% compared to the past 5 years.

Figure 114: Gas consumption in Slovenia from 2017 to 2022⁴¹⁴



Slovenia has not set a target for maintaining gas in underground storage facilities in neighbouring countries different than the one foreseen in the Gas Storage Regulation.

Measures to fulfil storage volume obligations

There are no regulatory measures in place setting requirements to market participants, in order to ensure that the storage volume obligations of the country will be met. Fulfilment of the targets relies on the market-based arrangements of the Slovenian market participants with their suppliers, and the SSOs of the neighbouring countries.

Slovenia has not signed a burden-sharing agreement with any of its neighbouring Member States.

Implementation of storage volume obligations in 2022/23

Slovenia did not rely on stockholding of alternative fuels to meet the storage volume obligations in 2022/23.

According to the Energy Agency, in 2022 gas suppliers declared that they stored in neighbouring countries 11% out of the 15% target. The reason for this deviation was mainly the limited available storage capacity in the neighbouring Member States.

⁴¹⁴ Source: Eurostat

Annex 4: Assessment of measures contribution in each Member State

Austria

Minimum volume in gas storage (point (a) of Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The GWG 2011 clearly describes how the measure must be implemented, within the frame of the supply standard	1
	Monitored and verified implementation	E-Control monitors implementation of the measures, and verifies the suppliers' compliance	1
	Transparent application and outcomes	The general outcome of the review of E-Control is published and the individual outcome is submitted to the supplier. The suppliers are not obligated to publish their gas stock levels	0.5
	Involved parties are aware of their obligation and costs	E-Control enacted an ordinance with detailed provisions on how to carry out the review of the gas supply standard, on the collection modalities and on the type of evidence required. The involved parties are aware of their obligations, but these are not published	0.5
Non-discriminatory	Non-discriminatory allocation of costs	Not applicable – Each supplier charges its own customers according to its own pricing strategy	N/A
	Non-discriminatory obligations set for involved parties	All suppliers applying the supply standard have the obligation to store gas according to their gas sales to protected customers	1
	Access to the stored gas not limited to specific uses	Stored gas concerns implementation of the supply standard. All suppliers applying the standard can use the stored gas to supply their protected customers (no limitations to which of the protected customers the supplier will supply gas to)	1
Contribution to security of supply	Measure's contribution to storage filling levels	Impact of the measure is limited. The stored volumes resulting from the application of the supply standard correspond to around 4% of the storage capacity. However, most storage contracts were already in place prior to 2022, so only part of the stored volumes should be considered as additional, resulting from the 2022 amendment of the GWG 2011.	0.33
	Measure increased share of stored gas in consumption	Withdrawals from the storages during the winter period of 2022/23 corresponded to 92% of gas consumption during that period, significantly lower than that ratio during the period 2017 - 2021, that averaged 146%	0
Cost estimation	Financing is defined and covers all required costs	Not applicable – Each supplier charges its own customers according to its own pricing strategy	N/A
	Effective collection of revenues to cover costs	Suppliers recover their costs from the charges to their protected customers. Thus, recovery of the suppliers' costs is not secured (e.g., in case the suppliers lose part of their customer base or revenue collection is not fully successful)	0.5
	Incentives provided for applying the measure	In case that gas suppliers do not comply with the measure, they are fined with an administrative fee (up to 75.000 €).	1
Effects on the gas markets	Impact on market competition	Implementation of the measure may have resulted on a minor impact to the market. Some small suppliers were required to book additional capacity to comply with the measure, which may have impacted storage	1

		costs. The prices for retail customers could potentially have increased, due to the additional costs incurred by the suppliers for storing gas. These however are assumptions, as there is no evidence on the measure's impact on the market. Considering that the gas volumes resulting from this measure correspond to less than 2% of the annual demand, any impact of the measure will be very limited	
	Impact on infrastructure congestion	Information not available	-
	Impact on operation of organized markets	There is no evidence on the measure's impact on wholesale prices	-

Unused booked capacities (point (g) of Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The GWG 2011 clearly describes the UIOLI mechanism that SSOs must apply	1
	Monitored and verified implementation	SSOs monitor if there is unused capacity, in coordination with E-Control	1
	Transparent application and outcomes	Decisions for release of capacity are published, and the capacity is offered in the market	1
	Involved parties are aware of their obligation and costs	The obligations of the storage users with regards to filling are foreseen in the GWG 2011. The terms for using the capacity, including the UIOLI clause are stipulated in the storage contract	1
Non-discriminatory	Non-discriminatory allocation of costs	Not applicable – No additional costs have to be recovered by the SSO, as the storage user continues to pay for the released capacity	N/A
	Non-discriminatory obligations set for involved parties	The UIOLI clause applies to all storage users with booked capacity	1
	Access to the stored gas not limited to specific uses	Not applicable – The measure concerns storage capacity and not gas volumes	N/A
Contribution to security of supply	Measure's contribution to storage filling levels	Impact of the measure is significant. In 2022 21 TWh of unused capacity (22% of Austria's overall storage capacity), previously held by Gazprom Export, have been released through this measure, and the whole capacity has been booked by other market participants, including use by ASGM for the strategic reserves	1
	Measure increased share of stored gas in consumption	Not applicable – The measure was in place prior to 2022 and the Gas Storage Regulation	N/A
Cost estimation	Financing is defined and covers all required costs	Not applicable – No financing of the measure is needed. The SSO continues to receive the storage tariff from the user having its capacity released, until it is booked by another user	N/A
	Effective collection of revenues to cover costs	The SSO recovers its costs, through the storage tariffs, from the user having its capacity released, or the user that subsequently booked the released capacity	1
	Incentives provided for applying the measure	An SSO may lose all its storage capacity rights, in case of no compliance with the obligations of the measure	1
	Impact on market competition	The UIOLI mechanism implementation had a positive impact on the storage market, as it allowed unused	1

Effects on the gas markets		capacity to be released in the market, and to be booked by other market participants.	
	Impact on infrastructure congestion	The implementation of the measure relieved the congestion in the gas storage system, as unused storage capacity was made available to the market.	1
	Impact on operation of organized markets	The UIOLI mechanism does not have an impact on wholesale prices	1

Strategic storage (point (h) of Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The GWG 2011 defines the obligations of ASGM for procuring and managing a strategic gas reserve	1
	Monitored and verified implementation	The AGGM must report to the National Council, E-Control, the Federal Minister for Climate Action, Environment, Energy, Mobility, Innovation and Technology, the Federal Minister for Digital and Economic Affairs and the Federal Minister of Finance a report, which contains a summary of the results of the tendering procedure	1
	Transparent application and outcomes	ASGM publishes information regarding the results of the tenders for strategic reserves, including the volumes procured and the relevant costs	1
	Involved parties are aware of their obligation and costs	The stockholding obligation of ASGM is defined by a Decree of the Federal Government	1
Non-discriminatory	Non-discriminatory allocation of costs	The costs incurred by ASGM for establishing and maintaining the strategic reserves are allocated to all taxpayers (covered by Federal Funds)	1
	Non-discriminatory obligations set for involved parties	Not applicable – The obligation is assigned to an affiliate of the distribution area manager	N/A
	Access to the stored gas not limited to specific uses	Not applicable – The obligation is assigned to an affiliate of the distribution area manager	N/A
Contribution to security of supply	Measure's contribution to storage filling levels	Impact of the measure is significant. The strategic reserves correspond to 22% of the storage capacity (20 TWh). Part of these volumes were stored in Haidach UGS, after the UIOLI mechanism was applied to release capacity booked by Gazprom Export	1
	Measure increased share of stored gas in consumption	Not applicable- The measure does not impact gas withdrawals as stocks must remain in storage for the whole year	N/A
Cost estimation	Financing is defined and covers all required costs	ASGM (and consequently AGGM) should not make any profits or losses from implementing this measure. The costs covered include cost of capital, storage fees, system charges, operational expenses, any valuation gains or losses and any taxes, fees or levies payable	1
	Effective collection of revenues to cover costs	The costs incurred by ASGM for establishing and maintaining the strategic reserves are covered by Federal Funds	1
	Incentives provided for applying the measure	Not applicable – The obligation is assigned to an affiliate of the distribution area manager	N/A
Effects on the gas markets	Impact on market competition	The measure will be in place at least until the end of 2025 and may extend up to 2027. Therefore, the gas volumes procured by ASGM, which correspond to 22%	1

		of gas demand in 2022, will not have to be released to the market, at least for the next 3-4 years	
	Impact on infrastructure congestion	Booking of a significant part of the storage capacity (almost 22%) by ASGM, the withheld capacity may result in contractual congestion for the storage users seeking to book capacity	0
	Impact on operation of organized markets	There is no evidence on the measure's impact on wholesale prices	-

Belgium

Tender of capacities (point (b) of Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The Storage Access Code describes how capacity is auctioned, and the storage filling obligations of storage users contracting capacity	1
	Monitored and verified implementation	CREG monitors implementation of the measure, with information on the filling trajectories and forecasts reported from the SSO	1
	Transparent application and outcomes	The outcomes of the storage capacity auctions are published by the SSO	1
	Involved parties are aware of their obligation and costs	The mechanism for booking capacity, the obligations of the storage users and the penalties involved if these are not met are published	1
Non-discriminatory	Non-discriminatory allocation of costs	Not applicable – Each storage user recovers its costs according to its own strategy (e.g., suppliers based on their charges to their final consumers)	N/A
	Non-discriminatory obligations set for involved parties	All storage users have to meet filling targets according to their booked capacity	1
	Access to the stored gas not limited to specific uses	There are no limitations on how the stored gas can be sold in the market, as long as the filling obligations of the storage user are met	1
Contribution to security of supply	Measure's contribution to storage filling levels	A small increase in filling levels was observed in 2022 compared to 2019 and 2020. However, the extent to which this was due to the additional control points introduced in 2022, and not for commercial purposes, cannot be deduced with certainty	N/A
	Measure increased share of stored gas in consumption	Withdrawals from the storage during the winter period of 2022/23 corresponded to 8.5% of consumption during that period, slightly higher than the ratio in 2020 and 2020. This increase was due to a drop in gas demand, rather than an increase of storage withdrawals, thus it does not seem that the measure contributed to increasing storage use to cover demand	0
Cost estimation	Financing is defined and covers all required costs	Not applicable – Each storage user recovers its costs according to its own strategy (e.g., suppliers based on their charges to their final consumers)	N/A
	Effective collection of revenues to cover costs	Each storage user recovers its own costs from its activities. Thus, recovery of the users' costs is not secured (e.g., in case suppliers using the storage lose part of their customer base or revenue collection is not fully successful)	0.5
	Incentives provided for applying the measure	If a storage user does not meet its filling target, it will pay a daily filling trajectory penalty that amounts to 10% of ZTP gas spot price per MWh below the target	1
Effects on the gas markets	Impact on market competition	Capacity was booked by several market participants, without any negative impact to the market reported	1
	Impact on infrastructure congestion	The full storage capacity was allocated without congestion	1
	Impact on operation of organized markets	The amendments to the capacity allocation mechanism do not appear to have impacted the market	1

Unused booked capacities (point (g) of Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The Storage Access Code and the Storage Standard Agreement clearly describe the UIOLI mechanism	1
	Monitored and verified implementation	The SSO monitors the ability of the market participants to meet their filling targets and the Ministry of Economic Affairs- Department of Energy with CREG determines if and how any capacities will be released	1
	Transparent application and outcomes	Any capacity released due to the UIOLI mechanism is offered to the market	1
	Involved parties are aware of their obligation and costs	The obligations of the storage users with regards to filling are foreseen in the Storage Access Code. The terms for using the capacity, including the UIOLI clause are stipulated in the storage contract	1
Non-discriminatory	Non-discriminatory allocation of costs	Not applicable – No additional costs have to be recovered by the SSO, as the storage user continues to pay for the released capacity	N/A
	Non-discriminatory obligations set for involved parties	The UIOLI clause applies to all storage users with booked capacity	1
	Access to the stored gas not limited to specific uses	Not applicable – The measure concerns storage capacity and not gas volumes	N/A
Contribution to security of supply	Measure's contribution to storage filling levels	The UIOLI mechanism has not been used so far	0
	Measure increased share of stored gas in consumption	The UIOLI mechanism has not been used so far	0
Cost estimation	Financing is defined and covers all required costs	Not applicable – No financing of the measure is needed. The SSO continues to receive the storage tariff from the user having its capacity released, until it is booked by another user	N/A
	Effective collection of revenues to cover costs	The SSO recovers its costs, through the storage tariffs, from the user having its capacity released, or the user that subsequently booked the released capacity	1
	Incentives provided for applying the measure	Not applicable – the measure itself is a penalty for the storage user	N/A
Effects on the gas markets	Impact on market competition	The UIOLI mechanism has not been used so far	-
	Impact on infrastructure congestion	The UIOLI mechanism has not been used so far	-
	Impact on operation of organized markets	The UIOLI mechanism has not been used so far	-

Discounts on storage tariffs (point (j) of Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The Storage Access Code allows the reserve price in auctions to be set up to the regulated tariff	1
	Monitored and verified implementation	CREG monitors the offered discounts	1
	Transparent application and outcomes	The reserve price of each auction is published by the SSO. The outcomes of the auctions are also published. However, the gas stocks established by the storage users are not published.	0.5

	Involved parties are aware of their obligation and costs	Filling level targets related to the booked capacity are published, but the individual target of each user is not.	0.5
Non-discriminatory	Non-discriminatory allocation of costs	Any deficit in the SSO's revenues is recovered from the regularization account. The use of this account may impact future storage tariffs	0.75
	Non-discriminatory obligations set for involved parties	Not applicable – No storage filling obligations are linked to the offering of discounts	N/A
	Access to the stored gas not limited to specific uses	There are no limitations on how the stored gas can be sold in the market, as long as the filling obligations of the storage user are met	1
Contribution to security of supply	Measure's contribution to storage filling levels	It is not possible to distinguish between the booking of discounted capacity for commercial purposes and that for meeting the filling targets	N/A
	Measure increased share of stored gas in consumption	Not applicable – The measure was in place prior to 2022 and the Gas Storage Regulation	N/A
Cost estimation	Financing is defined and covers all required costs	Offering of a discount does not incur additional costs for the SSO, but may result in revenue losses, which are recognized by CREG and recovered from the regularization account	1
	Effective collection of revenues to cover costs	Any deficit in the SSO's revenues is recovered from the regularization account (as with any other under-recovery of revenues)	1
	Incentives provided for applying the measure	The measure itself is an incentive to market participants to book and use storage capacity	1
Effects on the gas markets	Impact on market competition	Capacity was booked by several market participants, without any negative impact to the market reported	1
	Impact on infrastructure congestion	The full storage capacity was allocated without congestion	1
	Impact on operation of organized markets	It does not appear that offering of discounts in 2022 had a different impact in the wholesale market compared to the previous years	1

Bulgaria

Minimum volume in gas storage (point (a) of Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The Energy Act provides limited information regarding the measure. Some details on the measure are included in the emergency plan issued by the Ministry of Energy, without however fully describing the measure's mechanism	0.5
	Monitored and verified implementation	The Ministry of Energy is responsible for monitoring the measure's implementation. However, the monitoring obligations are not clearly defined	0.5
	Transparent application and outcomes	Market participants implementing the measure are not obligated to publish their gas stock levels and the relevant costs	0
	Involved parties are aware of their obligation and costs	An indicative aggregate storage obligation (290 mcm) for all market participants implementing the measure is defined in the emergency plan	0.5
Non-discriminatory	Non-discriminatory allocation of costs	Not applicable – Each supplier charges its own customers in accordance with its own pricing strategy	N/A
	Non-discriminatory obligations set for involved parties	The obligation for stockholding is set only to suppliers serving consumers that have significantly higher consumption in winter compared to the summer period (fluctuation of a consumer is determined through a formula specified in the emergency plan)	0.5
	Access to the stored gas not limited to specific uses	The suppliers can use stored gas to supply their customers in accordance with the supply contracts	1
Contribution to security of supply	Measure's contribution to storage filling levels	Information not available – An aggregate "indicative" obligation of 290 mcm for all suppliers (corresponding to 51% of the storage's capacity) is defined in the emergency plan, however the actual volumes stored as a result of the measure are not published	-
	Measure increased share of stored gas in consumption	Not applicable – The measure was in place prior to 2022 and the Gas Storage Regulation	N/A
Cost estimation	Financing is defined and covers all required costs	Not applicable - Each supplier charges its own customers in accordance with its own pricing strategy	N/A
	Effective collection of revenues to cover costs	Suppliers recover their costs from the charges to their protected customers. Thus, recovery of the suppliers' costs is not secured (e.g., in case the suppliers lose part of their customer base or revenue collection is not fully successful)	0.5
	Incentives provided for applying the measure	Information not available	-
Effects on the gas markets	Impact on market competition	Information not available	-
	Impact on infrastructure congestion	Information not available	-
	Impact on operation of organized markets	Information not available	-

Strategic storage (point (h) of Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	Bulgartransgaz is assigned to store natural gas quantities in Chrien UGS up to a maximum volume of 70mcm, upon order by the Minister of Energy but it is not clarified how it is defined if there is a need to keep gas stocks.	0.5
	Monitored and verified implementation	Information not available	-
	Transparent application and outcomes	Bulgartransgaz does not appear to publish information regarding the gas stocks it has established and the relevant costs	0
	Involved parties are aware of their obligation and costs	Stockholding obligations of Bulgartransgaz must be published in an Order by the Ministry of Energy, in the form of a public service obligation	1
Non-discriminatory	Non-discriminatory allocation of costs	Costs for implementing the measure are recovered only from gas consumers, through the gas transmission tariffs	0.75
	Non-discriminatory obligations set for involved parties	Not applicable - The obligation is assigned to the TSO	N/A
	Access to the stored gas not limited to specific uses	Not applicable - The obligation is assigned to the TSO	N/A
Contribution to security of supply	Measure's contribution to storage filling levels	Information not available – The emergency plan sets a maximum obligation to Bulgartransgaz of 70 mcm (corresponding to 12% of the storage's capacity), however the actual volumes stored by Bulgartransgaz as a result of the measure are not available	-
	Measure increased share of stored gas in consumption	Not applicable – The measure was in place prior to 2022 and the Gas Storage Regulation	N/A
Cost estimation	Financing is defined and covers all required costs	The costs incurred by Bulgartransgaz for establishing and maintaining the gas stocks are included in the transmission tariff	1
	Effective collection of revenues to cover costs	Recovery of costs through the transmission tariff ensure that sufficient revenues will be collected	1
	Incentives provided for applying the measure	No incentives or penalties are explicitly foreseen	0
Effects on the gas markets	Impact on market competition	Information not available	-
	Impact on infrastructure congestion	Information not available	-
	Impact on operation of organized markets	Information not available	-

Croatia

Minimum volume in gas storage (point (a) of Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The measure and the relevant storage users' obligations are described in a Decision issued by the Ministry of Economy and Sustainable Development	1
	Monitored and verified implementation	The Ministry of Economy and Sustainable Development is responsible for monitoring implementation of the measure, receiving information from the SSO concerning booking and use of the storage capacity	1
	Transparent application and outcomes	The storage users are not obligated to publish their gas stock levels and the relevant costs	0
	Involved parties are aware of their obligation and costs	The filling targets of the individual storage users are not published. The aggregate filling targets for all storage users (as share of the capacity) is published in the relevant Decision issued by the Ministry of Economy and Sustainable Development	0.5
Non-discriminatory	Non-discriminatory allocation of costs	Not applicable – Each supplier charges its own customers in accordance with its own pricing strategy	N/A
	Non-discriminatory obligations set for involved parties	All storage users have to meet filling targets according to their booked capacity	1
	Access to the stored gas not limited to specific uses	There are no limitations on how the stored gas can be sold in the market, as long as the filling obligations of the storage user are met	1
Contribution to security of supply	Measure's contribution to storage filling levels	Impact of the measure is significant. Gas stored by suppliers in the beginning of the 2022 withdrawal period amounted to 1.8 TWh, corresponding to 37% of the storage capacity	1
	Measure increased share of stored gas in consumption	Withdrawals from the storages during the winter period of 2022/23 corresponded to 10% of gas consumption during that period, significantly lower than that ratio during the period 2017 - 2021, that averaged 22%	0
Cost estimation	Financing is defined and covers all required costs	Not applicable – Each supplier charges its own customers in accordance with its own pricing strategy	N/A
	Effective collection of revenues to cover costs	Suppliers recover their costs from the charges to their protected customers. Thus, recovery of the suppliers' costs is not secured (e.g., in case the suppliers lose part of their customer base or revenue collection is not fully successful)	0.5
	Incentives provided for applying the measure	Discounts to the transmission tariffs for the entry-exit point to the underground storage facility (100% for the exit and 90% for the entry) are offered as an incentive. A UIOLI mechanism is also in place to transfer unused storage capacity to HEP (to be used for the gas reserve)	1
Effects on the gas markets	Impact on market competition	There is no evidence of the measure's impact on the gas market competition	-
	Impact on infrastructure congestion	No congestion at the transmission system and storage facility due to the measure's implementation has been reported	1

	Impact on operation of organized markets	There is no evidence on the measure's impact on wholesale prices	-
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Balancing stock managed by TSO (point (c1) of Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The Gas Market Act clearly describes the option provided to Plinacro to store gas for operational purposes	1
	Monitored and verified implementation	There is no explicit monitoring obligation since this measure is an option not an obligation for Plinacro	0
	Transparent application and outcomes	Plinacro does not publish any information concerning the storing of gas for operational purposes	0
	Involved parties are aware of their obligation and costs	The amount of gas that Plinacro can store under this measure is published in the relevant Decision issued by the Ministry of Economy and Sustainable Development	1
Non-discriminatory	Non-discriminatory allocation of costs	The costs incurred by the TSO for implementing this measure are allocated only to gas consumers, through the transmission tariffs (including cross-border points)	0.75
	Non-discriminatory obligations set for involved parties	Not applicable – The obligation is assigned to the TSO	N/A
	Access to the stored gas not limited to specific uses	Not applicable – The obligation is assigned to the TSO	N/A
Contribution to security of supply	Measure's contribution to storage filling levels	Impact of the measure is immaterial. Plinacro may store 50 MWh, corresponding to 1% of the capacity	0
	Measure increased share of stored gas in consumption	Not applicable – The measure was in place prior to 2022 and the Gas Storage Regulation	N/A
Cost estimation	Financing is defined and covers all required costs	The costs incurred by the TSO for establishing and maintaining the gas stocks are included in the transmission tariff	1
	Effective collection of revenues to cover costs	Recovery of costs through the transmission tariff ensure that sufficient revenues will be collected	1
	Incentives provided for applying the measure	No incentives or penalties are explicitly foreseen	0
Effects on the gas markets	Impact on market competition	The gas volumes related to this measure are very small (just 0.2% of annual consumption) and therefore have no impact on market competition	1
	Impact on infrastructure congestion	No congestion at the transmission system and storage facility due to the measure's implementation has been reported	1
	Impact on operation of organized markets	The gas volumes related to this measure are small (just 0.2% of annual consumption) and therefore it can be considered that the measure has insignificant impact on market prices	1

Appointment of dedicated entity – Point (i) of Article 6b(1)

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The obligation of HEP to establish and maintain a gas reserve is clearly described in a Decision issued by the Ministry of Economy and Sustainable Development	1

	Monitored and verified implementation	The Ministry of Economy and Sustainable Development is responsible for monitoring the implementation of the measure, receiving reports from HEP concerning the actions taken	1
	Transparent application and outcomes	HEP has not published information concerning the gas reserve established and the relevant costs	0
	Involved parties are aware of their obligation and costs	The gas stockholding obligation of HEP is published in the relevant Decision issued by the Ministry of Economy and Sustainable Development	1
Non-discriminatory	Non-discriminatory allocation of costs	HEP recovers part of its costs for implementing the measure through sales of the gas reserves to protected customers, and in case the revenues are not sufficient to cover its costs, through supplementary contributions from the State budget. The part of the costs covered through the gas sales is allocated only to the part of the protected customers to which HEP is selling gas, while the other part is allocated to all taxpayers	0.5
	Non-discriminatory obligations set for involved parties	The stockholding obligation is set to only one market participant, HEP	0
	Access to the stored gas not limited to specific uses	The stored gas must be sold in the winter period only to households that use public service gas supply, customers of thermal energy from an independent heating system, and other protected gas customers.	0
Contribution to security of supply	Measure's contribution to storage filling levels	Impact of the measure is significant. The gas reserve established by HEP amounts to 2.7 TWh, i.e., 56% of the storage capacity	1
	Measure increased share of stored gas in consumption	Withdrawals from the storages during the winter period of 2022/23 corresponded to 10% of gas consumption during that period, significantly lower than that ratio during the period 2017 - 2021, that averaged 22%	0
Cost estimation	Financing is defined and covers all required costs	HEP recovers all its costs for implementing the measure. HEP collects revenues from sales of the reserves to protected customers, and in case these are not sufficient to cover the costs (including procurement, storage tariffs and financing costs), a contribution from the State budget is made	1
	Effective collection of revenues to cover costs	Recovery of HEP's costs for implementing the measure is secured, as any difference between the purchase and sale price of gas, storage costs and financing costs is covered from the State budget	1
	Incentives provided for applying the measure	No incentives or penalties are explicitly foreseen	0
Effects on the gas markets	Impact on market competition	Gas volumes procured by HEP (which suppliers did not intend to procure and store on their own) will be sold directly to suppliers of protected customers, with any deficit covered through the State budget, and thus not affecting market prices	1
	Impact on infrastructure congestion	No congestion at the transmission system and storage facility due to the measure's implementation has been reported	1
	Impact on operation of organized markets	Gas volumes will be directly sold to suppliers of protected customers	1

Czech Republic

Minimum volume in gas storage (point (a) of Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The Energy Act clearly describes how the measure must be implemented, within the frame of the supply standard	1
	Monitored and verified implementation	ERÚ monitors implementation of the measures, and verifies the suppliers' compliance	1
	Transparent application and outcomes	The suppliers are not obligated to publish their gas stock levels and the relevant costs	0
	Involved parties are aware of their obligation and costs	Storage volume obligation of each supplier, and relevant costs are not publicly available. Each supplier calculates its own obligations and submits relevant proof to ERÚ	0.5
Non-discriminatory	Non-discriminatory allocation of costs	Not applicable – Each supplier charges its own customers in accordance with its own pricing strategy	N/A
	Non-discriminatory obligations set for involved parties	All suppliers applying the supply standard have the obligation to store gas according to their gas sales to protected customers	1
	Access to the stored gas not limited to specific uses	Stored gas concerns implementation of the supply standard. All suppliers applying the standard can use the stored gas to supply their protected customers (no limitations to which of the protected customers the supplier will supply gas to)	1
Contribution to security of supply	Measure's contribution to storage filling levels	Impact of the measure is limited. According to ERÚ, this measure increases storage filling by 5%	0.33
	Measure increased share of stored gas in consumption	Not applicable – The measure was in place prior to 2022 and the Gas Storage Regulation	N/A
Cost estimation	Financing is defined and covers all required costs	Not applicable - Each supplier charges its own customers in accordance with its own pricing strategy	N/A
	Effective collection of revenues to cover costs	Suppliers recover their costs from the charges to their protected customers. Thus, recovery of the suppliers' costs is not secured (e.g., in case the suppliers lose part of their customer base or revenue collection is not fully successful)	0.5
	Incentives provided for applying the measure	In case that gas suppliers do not comply with the measure, they are fined with an administrative fee (around 2 mil. € or 1% of their net turnover)	1
Effects on the gas markets	Impact on market competition	The measure has moderately impacted the market. Some suppliers seek to minimize their gas stock obligations, by limiting their portfolio of protected customers, mainly to avoid having to procure gas at high prices to supply new protected customers with high consumption in winter	0.5
	Impact on infrastructure congestion	Given that the storage volume designated for protected customers is a limited share of the total demand, the impact on the overall storage and transmission capacity is minimal	1
	Impact on operation of organized markets	It does not appear that the measure's application in 2022 had a different impact in the wholesale market compared to the previous years	1

Obligations imposed on designated entities (point (c2) of the Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The Energy Act clearly describes the measure and the storage users' obligations	1
	Monitored and verified implementation	ERÚ and the Ministry are responsible for monitoring the implementation of the measure, receiving information from the SSO on the users' activities, stored volumes and potentially unused capacity	1
	Transparent application and outcomes	The results of the overall obligation are published, as the filling level of the storage is published daily. Storage users are not obligated to publish their gas stock levels and the relevant costs	0.5
	Involved parties are aware of their obligation and costs	The filling targets of the individual storage users are not published. Only the filling targets for the whole storage (in accordance with the trajectories and targets for the Czech Republic in the Gas Storage Regulation) are publicly available	0.5
Non-discriminatory	Non-discriminatory allocation of costs	Not applicable – Each storage user charges its own customers in accordance with its own pricing strategy	N/A
	Non-discriminatory obligations set for involved parties	All storage users have to meet filling targets according to their booked capacity	1
	Access to the stored gas not limited to specific uses	There are no limitations on how the stored gas can be sold in the market, as long as the filling obligations of the storage user are met	1
Contribution to security of supply	Measure's contribution to storage filling levels	According to ERÚ, the measure has influenced the behaviour of market participants in terms of gas storage. They have consistently filled the facilities even prior to the prescribed time periods, maintaining high storage levels throughout the heating season. Although the impact cannot be sized quantitatively, at least a limited contribution of the measure to storage filling can be assigned.	0.33
	Measure increased share of stored gas in consumption	Withdrawals from the storages during the winter period of 2022/23 corresponded to 47% of gas consumption during that period, at similar levels with 2021/22. However, in absolute terms withdrawals are lower than the previous year, thus it does not seem that the measure contributed to increasing storage use to cover demand	0
Cost estimation	Financing is defined and covers all required costs	Not applicable – Each storage user charges its own customers in accordance with its own pricing strategy	N/A
	Effective collection of revenues to cover costs	Suppliers recover their costs from the charges to their protected customers. Thus, recovery of the suppliers' costs is not secured (e.g., in case the suppliers lose part of their customer base or revenue collection is not fully successful)	0.5
	Incentives provided for applying the measure	A UIOLI mechanism applies in case a storage user does not meet its stockholding obligations. The user continues to pay for the contracted and released capacity even after it is booked by another user	1
Effects on the gas markets	Impact on market competition	The obligations set to the storage users do not appear to impact the market	1
	Impact on infrastructure congestion	No congestion at the transmission system and storage facilities has been observed due to implementation on the measure	1

	Impact on operation of organized markets	There is no evidence on the measure's impact on wholesale prices	-
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Financial incentives for market participants (point (f) of the Article 6b(1)) – offering of contracts for differences

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	An Order by the Ministry of Industry and Trade describes how contracts for differences will be offered to storage users	1
	Monitored and verified implementation	The Ministry of Industry and Trade, with the support of ERÚ, is responsible for monitoring implementation of the measure. To do so, the TSO and SSOs submit information related to the auctions, and the special balance account of each storage user	1
	Transparent application and outcomes	Although storage users are not obligated to publish their gas stocks, the aggregate results of each auction and the aggregate volumes of the special balance account are published by the respective SSO	0.5
	Involved parties are aware of their obligation and costs	The terms and conditions for entering into CfDs, and the obligations are known to all market participants	1
Non-discriminatory	Non-discriminatory allocation of costs	Costs for this measure are allocated to all taxpayers (costs are covered from the State budget)	1
	Non-discriminatory obligations set for involved parties	Participation to the auctions for CfDs is optional. The same terms apply to all participants	1
	Access to the stored gas not limited to specific uses	There are no limitations on how the stored gas can be sold in the market, as long as the filling obligations of the storage user are met	1
Contribution to security of supply	Measure's contribution to storage filling levels	The measure had a moderate impact. Storage users with CfDs injected 4.6 TWh at the special balance accounts, corresponding to 12% of the storage capacity. Out of these, 4.2 TWh, i.e., 11% of the capacity, came from new injections	0.66
	Measure increased share of stored gas in consumption	Withdrawals from the storages during the winter period of 2022/23 corresponded to 47% of gas consumption during that period, at similar levels with 2021/22. However, in absolute terms withdrawals are lower than the previous year, thus it does not seem that the measure contributed to increasing storage use to cover demand	0
Cost estimation	Financing is defined and covers all required costs	The TSO, NET4GAS is responsible for payments to the storage users. The TSO is compensated through the State budget	1
	Effective collection of revenues to cover costs	Collection of revenues is secured as the costs are covered from the State budget	1
	Incentives provided for applying the measure	Not applicable – The measure itself is an incentive offered to market participants to book and use storage capacity	N/A
Effects on the gas markets	Impact on market competition	Impact of the measure on the market was limited. Soon after its implementation the typical summer-winter spreads returned, and as a result the interest of the market for the incentive was not high	1

	Impact on infrastructure congestion	No congestion at the transmission system and storage facilities has been observed due to implementation on the measure	1
	Impact on operation of organized markets	There is no evidence on the measure's impact on wholesale prices	-

Financial incentives for market participants (point (f) of the Article 6b(1)) – offering financial incentives to ČEZ

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The mechanism through which the State provide incentives to ČEZ is not clearly described	0.5
	Monitored and verified implementation	The Ministry of Industry and Trade is responsible for monitoring implementation of the measure. However, the monitoring mechanism is clear	0.5
	Transparent application and outcomes	ČEZ does not publish information regarding the gas volumes procured and injected in storage	0
	Involved parties are aware of their obligation and costs	The obligations of ČEZ for stockholding and the relevant costs are not published (only the booked capacity of 3 bcm/yr at the LNG terminal has been published)	0
Non-discriminatory	Non-discriminatory allocation of costs	Costs for this measure are allocated to all taxpayers (costs are covered from the State budget)	1
	Non-discriminatory obligations set for involved parties	The measure applies only to one market participant	0
	Access to the stored gas not limited to specific uses	No information is available concerning the use of gas procured under this scheme	-
Contribution to security of supply	Measure's contribution to storage filling levels	According to ERÚ, the potential of the contribution of the incentive to ČEZ could have been substantial, given the volume of capacity booked. However, information on the actual gas volumes which were procured and injected in the storages is not publicly available.	-
	Measure increased share of stored gas in consumption	Withdrawals from the storages during the winter period of 2022/23 corresponded to 47% of gas consumption during that period, at similar levels with 2021/22. However, in absolute terms withdrawals are lower than the previous year, thus it does not seem that the measure contributed to increasing storage use to cover demand	0
Cost estimation	Financing is defined and covers all required costs	No information on the specific cost covered through this measure	-
	Effective collection of revenues to cover costs	Costs are recovered from the State budget	1
	Incentives provided for applying the measure	No information on incentives or penalties is available	-
Effects on the gas markets	Impact on market competition	As details on the contract between the State and ČEZ are not publicly available, it is not possible to assess the impact that this measure has on market competition and gas prices. It has to be noted, though that no market participant has raised concerns about this mechanism.	-

	Impact on infrastructure congestion	No congestion at the transmission system and storage facilities has been observed due to implementation on the measure	1
	Impact on operation of organized markets	There is no evidence on the measure's impact on wholesale prices	-

Unused Booked Capacities (point (g) of the Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The Energy Act clearly describes the UIOLI mechanism that SSOs must apply	1
	Monitored and verified implementation	The Ministry of Industry and Trade and ERÚ are responsible for monitoring implementation of the measure, on the basis of information of the use of capacity provided by the SSOs	1
	Transparent application and outcomes	Decisions for release of capacity are published, and the capacity is offered in the market	1
	Involved parties are aware of their obligation and costs	The obligations of the storage users with regards to filling are foreseen in the Energy Act. The terms for using the capacity, including the UIOLI clause are stipulated in the storage contract	1
Non-discriminatory	Non-discriminatory allocation of costs	Any costs incurred by the SSO, in case released capacity is booked at negative prices, are allocated to all taxpayers (costs are covered from the State budget)	1
	Non-discriminatory obligations set for involved parties	The UIOLI clause applies to all storage users with booked capacity.	1
	Access to the stored gas not limited to specific uses	Not applicable - The measure concerns storage capacity and not gas volumes	N/A
Contribution to security of supply	Measure's contribution to storage filling levels	Impact of the measure was moderate. In 2022 4.2 TWh of storage capacity was released from Gazprom, corresponding to 11% of the storage capacity	0.66
	Measure increased share of stored gas in consumption	Withdrawals from the storages during the winter period of 2022/23 corresponded to 47% of gas consumption during that period, at similar levels with 2021/22. However, in absolute terms withdrawals are lower than the previous year, thus it does not seem that the measure contributed to increasing storage use to cover demand	0
Cost estimation	Financing is defined and covers all required costs	The financing mechanism ensures that any deficit of the SSO is covered, in case released capacity is booked at negative prices	1
	Effective collection of revenues to cover costs	The SSO recovers any deficit from the State budget	1
	Incentives provided for applying the measure	Not applicable – the measure itself is a penalty for the storage user	N/A
Effects on the gas markets	Impact on market competition	The UIOLI mechanism had a positive impact on the market, as it allowed releasing unused capacity to the market, and thus increased utilization of the storage capacity	1
	Impact on infrastructure congestion	The implementation of the measure relieved the congestion in the gas storage system, as unused storage capacity was made available to the market	1
	Impact on operation of organized markets	The UIOLI mechanism does not have an impact on wholesale prices	1

Strategic Storage (point (h) of the Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The responsibilities and obligations of the Administration of State Material Reserves (ASMR) are clearly defined in Act No.97/1993	1
	Monitored and verified implementation	The Ministry of Industry and Trade is responsible for monitoring the implementation of ASMR's activities	1
	Transparent application and outcomes	Information of the gas reserved procured by ASMR and the underlying costs in 2022 were only published in press releases	0.5
	Involved parties are aware of their obligation and costs	The obligation set by the Ministry to ASMR is defined in a Decision issued by the Ministry	1
Non-discriminatory	Non-discriminatory allocation of costs	The costs incurred by ASGM f are allocated to all taxpayers (covered by the State budget)	1
	Non-discriminatory obligations set for involved parties	Not applicable – The obligation is assigned to a state entity	N/A
	Access to the stored gas not limited to specific uses	Not applicable – The obligation is assigned to a state entity	N/A
Contribution to security of supply	Measure's contribution to storage filling levels	The measure had a limited impact. The reserve established by ASMR in 2022 and 2023 amounted to 2.4 TWh, i.e., 6% of the storage capacity	0.33
	Measure increased share of stored gas in consumption	Not applicable- The measure does not impact gas withdrawals as stocks must remain in storage for the whole year	N/A
Cost estimation	Financing is defined and covers all required costs	The costs for gas procurement are covered directly by the State budget. Capacity is booked as zero price, according to the Energy Act, and thus ASMR does not have any storage costs	1
	Effective collection of revenues to cover costs	Recovery of ASMR's costs for implementing the measure is secured, as its costs is covered from the State budget	1
	Incentives provided for applying the measure	Not applicable – The obligation is assigned to a state entity	N/A
Effects on the gas markets	Impact on market competition	The gas volumes procured by ASMR may only be used in an emergency situation. Therefore, there is no impact on market competition	1
	Impact on infrastructure congestion	The implementation of the measure relieved the congestion in the gas storage system, as unused storage capacity was made available to the market	1
	Impact on operation of organized markets	The gas volumes procured by ASMR are limited (below 3% of annual gas consumption), therefore any impact of the measure on the gas market is insignificant	1

Denmark

Obligations imposed on designated entities (point (c2) of the Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The emergency plan provides an overview of the measure, and the tender documents includes details	1
	Monitored and verified implementation	The Danish Energy Agency monitors implementation of the measure, with information provided from the storage users and Energinet	1
	Transparent application and outcomes	Each storage user offering filling requirements is not obliged to publish information on their gas stocks and underlying costs. Energinet publishes the aggregate filling requirements procured with each tender	0.5
	Involved parties are aware of their obligation and costs	Energinet does not publish the filling requirements contracted with each storage user, but publishes the aggregate requested and secured gas volumes and the respective costs	0.5
Non-discriminatory	Non-discriminatory allocation of costs	The protected customers must pay higher emergency tariff compared to other final consumers, i.e., more costs are allocated to protected customers	0.5
	Non-discriminatory obligations set for involved parties	All storage users may participate in the tenders offering filling requirements	1
	Access to the stored gas not limited to specific uses	In principle, there are no limitations on how the stored gas can be sold in the market, as long as the filling requirements are met. In practice, 100% of the contracted capacity must be maintained in storage for most of the storage year, thus when offering filling requirements, the storage users would not be able to use their gas at all	1
Contribution to security of supply	Measure's contribution to storage filling levels	The measure had a moderate impact. In 2022 Energinet secured filling requirements amounting to 1.5 TWh and procured emergency storage/gas of 1.7 TWh. The aggregate 3.2 TWh correspond to 35% of the storage capacity	1
	Measure increased share of stored gas in consumption	Not applicable – The measure was in place prior to 2022 and the Gas Storage Regulation	N/A
Cost estimation	Financing is defined and covers all required costs	All costs incurred by Energinet for procuring filling requirements are included in the emergency tariff approved by DUR	1
	Effective collection of revenues to cover costs	Energinet collects the emergency tariff from all final consumers, ensuring cost recovery	1
	Incentives provided for applying the measure	In case that the storage user providing filling requirements fails to establish the required filling levels within the agreed deadlines, Energinet is entitled to procure the missing volumes, at the expense of the provider.	1
Effects on the gas markets	Impact on market competition	Provision of filling requirements is optional to market participants and does not affect their sales to final consumers. Therefore, the measure does not have an impact on market competition	1
	Impact on infrastructure congestion	Although in principle the offering of filling requirements may increase demand for gas storage, no congestion has been reported	1

	Impact on operation of organized markets	In principle, the provision of filling requirements may withdraw gas from the wholesale market and affect prices. In practice however, the volumes secured by Energinet correspond to 5-6% of the annual gas demand, including quantities that market participants already had in storage or intended to store. It can therefore be assumed that the impact on wholesale level is limited.	1
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France

Tender of capacities (point (b) of Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The amendments to Law No 2017-1839 clearly describe the changes to the tendering of capacities	1
	Monitored and verified implementation	CRE is responsible for monitoring the storage capacity auctions and their outcomes	1
	Transparent application and outcomes	The outcomes of the storage capacity auctions are published by the SSOs	1
	Involved parties are aware of their obligation and costs	The auction calendar is published by the SSOs. The obligations of the storage users and the penalties involved if these are not met are published	1
Non-discriminatory	Non-discriminatory allocation of costs	The difference (positive or negative) between the revenues derived from auctions and the regulated revenue is collected/returned through the transmission tariffs paid by gas consumers connected to domestic gas networks (cross-border points are excluded)	0.75
	Non-discriminatory obligations set for involved parties	All market participants have access to the more frequent auctions and the discounts to storage tariffs	1
	Access to the stored gas not limited to specific uses	Not applicable - the measure is related to the modalities of tendering of capacity and not stored gas	N/A
Contribution to security of supply	Measure's contribution to storage filling levels	Filling levels observed in 2022 were similar to those of the previous years. The extent to which storage filling was due to the measure, and not for commercial purposes, cannot be deduced with certainty	N/A
	Measure increased share of stored gas in consumption	Withdrawals from the storage during the winter period of 2022/23 corresponded to 47% of consumption during that period, higher than the ratio in the previous years. This increase was due to a drop in gas demand, rather than an increase of storage withdrawals, thus it does not seem that the measure contributed to increasing storage use to cover demand	0
Cost estimation	Financing is defined and covers all required costs	A mechanism is in place for recovering, through the transmission tariffs, any deficit of the SSOs due to the zero-reserve price at the capacity auctions	1
	Effective collection of revenues to cover costs	Recovery of costs through the transmission tariff ensure that sufficient revenues will be collected	1
	Incentives provided for applying the measure	Discounts to storage tariffs are offered (reserve price at the auctions is set to zero)	1
Effects on the gas markets	Impact on market competition	The amendments to the capacity allocation mechanism do not appear to have impacted the market	1
	Impact on infrastructure congestion	No congestion has been reported	1
	Impact on operation of organized markets	The amendments to the capacity allocation mechanism do not appear to have impacted the market	1

Appointment of dedicated entity (point (i) of the Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The measure is described in the Energy Code	1
	Monitored and verified implementation	CRE is responsible for monitoring the filling trajectories and the SSOs' compliance with the measure	1
	Transparent application and outcomes	No information available on whether SSOs are required to report any procurement and sales of gas stocks, and the relevant costs/revenues	-
	Involved parties are aware of their obligation and costs	The obligations of the SSOs are defined in an Order by the Minister responsible for energy	1
Non-discriminatory	Non-discriminatory allocation of costs	Costs incurred by the SSOs are socialized via a levy on the bills of the electricity and gas final consumers	1
	Non-discriminatory obligations set for involved parties	The obligation is assigned to both SSOs	1
	Access to the stored gas not limited to specific uses	The SSOs may sell the procured gas in the wholesale market without limitations	1
Contribution to security of supply	Measure's contribution to storage filling levels	The measure has not been triggered yet (auctions were successful and filling levels were high)	0
	Measure increased share of stored gas in consumption	The measure has not been triggered yet (auctions were successful and filling levels were high)	0
Cost estimation	Financing is defined and covers all required costs	All costs are recovered according to a mechanism to be defined by CRE	1
	Effective collection of revenues to cover costs	The costs incurred by the SSOs, reduced by the revenues from selling these stocks, are recovered through a levy imposed to energy consumers. Advance payments to the SSOs are possible, upon decision by CRE to avoid compromising the operators' financial viability	1
	Incentives provided for applying the measure	No incentives or penalties are provided	0
Effects on the gas markets	Impact on market competition	The measure has not been triggered yet (auctions were successful and filling levels were high)	-
	Impact on infrastructure congestion	The measure has not been triggered yet (auctions were successful and filling levels were high)	-
	Impact on operation of organized markets	The measure has not been triggered yet (auctions were successful and filling levels were high)	-

Germany

Obligations imposed on designated entities (point (c2) of the Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The Gas Storage Act (Section 35a to 35g EnWG) clearly describes how the measure must be implemented, and the obligations of THE	1
	Monitored and verified implementation	Monitoring of the measure's implementation is carried out by BMWK and BNetzA, within the frame of monitoring application of the whole Gas Storage Act and the storage filling obligations	1
	Transparent application and outcomes	The providers of SSBOs do not publish information concerning their storage filling vis a vis their SSBO obligations. THE publishes information concerning the outcomes of the SSBO tenders, and the level of the neutrality account	0.5
	Involved parties are aware of their obligation and costs	The storage filling obligations that THE must ensure are included in the Gas Storage Act, and the aggregate quantities contracted with each SSBO tender (on a regional level), and the relevant costs, are published by THE. However, the individual obligations of each SSBO provider are not published	0.5
Non-discriminatory	Non-discriminatory allocation of costs	The neutrality charge used to recover THE's costs is imposed on the volumes that a balancing group physically withdraws from the exit points of the market area, including cross-border points. Consequently, the costs are allocated to the gas consumers	0.75
	Non-discriminatory obligations set for involved parties	All balancing group managers in the market area may participate in the SSBO tenders. The location at which the services are requested (country-wide, regional, specific facility) depends on THE's needs for storage filling	1
	Access to the stored gas not limited to specific uses	The providers of SSBO products may freely withdraw and sell 80% of their contracted quantities (the remaining 20% concerns the call-off quantities), as long as they meet the filling obligations on the specific dates	1
Contribution to security of supply	Measure's contribution to storage filling levels	Contribution of the measure is significant. THE secured 34% of the capacity (84 TWh) in 2022, through 2 SSBO tenders. It is noted that it is not possible to know which of the procured filling requirements concern volumes that market participants intended to store or keep in storage even without the measure	1
	Measure increased share of stored gas in consumption	Withdrawals from the storages during the winter period of 2022/23 were significantly lower than in 2020 and 2021, following a decrease in consumption. It therefore appears that the measure did increase the use of stored gas	0
Cost estimation	Financing is defined and covers all required costs	The neutrality charge approved by BNetzA includes all the costs that THE incurs for its security of supply activities; procurement of SSBO products, procurement and storage of gas, call orders, financing costs, costs for human and material resources, as well as the revenues from THE's sales of procured gas. The charge is adjusted according to the actual costs and revenues of THE, ensuring its cost neutrality	1

	Effective collection of revenues to cover costs	The neutrality charge is applied to the balancing group managers at all physical exit points of the market area, ensuring collection of the necessary funds	1
	Incentives provided for applying the measure	A penalty is imposed to providers of SSBOs, in case they do not meet their obligations. The penalty is linked with the contracted fees resulting from the SSBO tender	1
Effects on the gas markets	Impact on market competition	Provision of SSBO products is optional to market participants and does not affect their sales to final consumers. Therefore, the measure does not have an impact on market competition	1
	Impact on infrastructure congestion	No congestion at the transmission system and storage facilities has been observed due to implementation on the measure	1
	Impact on operation of organized markets	There is no evidence on the measure's impact on wholesale prices	-

Unused booked capacities (point (g) of the Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The Gas Storage Act (Section 35a to 35g EnWG) clearly describes the UIOLI mechanism, while the detailed application is included in the terms and conditions of each SSO	1
	Monitored and verified implementation	BNetzA monitors implementation with information provided from the SSOs of the users' filling levels and booked capacity	1
	Transparent application and outcomes	The SSOs are not required to publish information related to booked and unused capacity of storage users that has been made available to THE.	0
	Involved parties are aware of their obligation and costs	The obligations of the storage users with regards to using their capacity and the cases that the UIOLI mechanism is triggered are defined in the respective SSO's terms and conditions	1
Non-discriminatory	Non-discriminatory allocation of costs	Not applicable - No additional costs have to be recovered by the SSO, as the storage user continues to pay for the released capacity	N/A
	Non-discriminatory obligations set for involved parties	The UIOLI clause applies to all storage users with booked capacity.	1
	Access to the stored gas not limited to specific uses	Not applicable, as the measure concerns storage capacity and not gas volumes	1
Contribution to security of supply	Measure's contribution to storage filling levels	The UIOLI mechanism was not used in 2022 and 2023	0
	Measure increased share of stored gas in consumption	The UIOLI mechanism was not used in 2022 and 2023	0
Cost estimation	Financing is defined and covers all required costs	Not applicable - No financing of the measure is needed. The SSO continues to receive the storage tariff from the user having its capacity released, until it is booked by another user	N/A

	Effective collection of revenues to cover costs	The SSO recovers its costs, through the storage tariffs, from the user having its capacity released, or the user that subsequently booked the released capacity	1
	Incentives provided for applying the measure	Not applicable – the measure itself is a penalty for the storage user	N/A
Effects on the gas markets	Impact on market competition	The UIOLI mechanism was not used in 2022 and 2023	-
	Impact on infrastructure congestion	The UIOLI mechanism was not used in 2022 and 2023	-
	Impact on operation of organized markets	The UIOLI mechanism was not used in 2022 and 2023	-

Strategic Storage (point (h) of the Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The Gas Storage Act (Section 35a to 35g EnWG) clearly describes how the measure must be implemented, and the obligations of THE	1
	Monitored and verified implementation	Monitoring of the measure’s implementation is carried out by BMWK and BNetzA, within the frame of monitoring application of the whole Gas Storage Act and the storage filling obligations	1
	Transparent application and outcomes	The providers of SSBOs do not publish information concerning their storage filling vis a vis their SSBO obligations. THE publishes information concerning the outcomes of the SSBO tenders, and the level of the neutrality account	0.5
	Involved parties are aware of their obligation and costs	The storage filling obligations that THE must ensure are included in the Gas Storage Act, and the aggregate call-off quantities contracted with each SSBO tender (on a regional level), and the relevant costs, are published by THE. However, the individual obligations for call-off quantities of each SSBO provider are not published	0.5
Non-discriminatory	Non-discriminatory allocation of costs	The neutrality charge used to recover THE's costs is imposed on the volumes that a balancing group physically withdraws from the exit points of the market area, including cross-border points. Consequently, the costs are allocated to the gas consumers	0.75
	Non-discriminatory obligations set for involved parties	All balancing group managers in the market area may participate in the SSBO tenders and establish call-off quantities	1
	Access to the stored gas not limited to specific uses	The measure does not impact gas withdrawals, as the call-off quantities must remain in storage throughout the SSBO agreement	0
Contribution to security of supply	Measure’s contribution to storage filling levels	The call-off option was not used in 2022 and 2023	0
	Measure increased share of stored gas in consumption	Not applicable - The call-off quantities must remain in storage throughout the SSBO agreement	N/A

Cost estimation	Financing is defined and covers all required costs	The neutrality charge approved by BNetzA includes all the costs that THE incurs for its security of supply activities; procurement of SSBO products, procurement and storage of gas, call orders, financing costs, costs for human and material resources, as well as the revenues from THE's sales of procured gas. The charge is adjusted according to the actual costs and revenues of THE, ensuring its cost neutrality	1
	Effective collection of revenues to cover costs	The neutrality charge is applied to the balancing group managers at all physical exit points of the market area, ensuring collection of the necessary funds	1
	Incentives provided for applying the measure	A penalty is imposed to providers of SSBOs, in case they do not meet their obligations. The penalty is linked with the contracted fees resulting from the SSBO tender	1
Effects on the gas markets	Impact on market competition	SSBO tenders are open to all balancing groups. No issues related to market competition due to the provision of SSBO products have been reported	1
	Impact on infrastructure congestion	Storing call-off quantities for the full duration of the withdrawal period may restrict the flexibility potential of storage capacity for the users. Nevertheless, according to BNetzA, no congestion at the transmission system and storage facilities has been observed.	1
	Impact on operation of organized markets	There is no evidence on the measure's impact on wholesale prices	-

Appointment of dedicated entity (point (i) of the Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The Gas Storage Act (Section 35a to 35g EnWG) clearly describes how the measure must be implemented, and the obligations of THE	1
	Monitored and verified implementation	Monitoring of the measure's implementation is carried out by BMWK and BNetzA, within the frame of monitoring application of the whole Gas Storage Act and the storage filling obligations	1
	Transparent application and outcomes	THE publishes information concerning the procurement of gas quantities, and the relevant costs	1
	Involved parties are aware of their obligation and costs	The storage filling obligations that THE must ensure are included in the Gas Storage Act	1
Non-discriminatory	Non-discriminatory allocation of costs	The neutrality charge used to recover THE's costs is imposed on the volumes that a balancing group physically withdraws from the exit points of the market area, including cross-border points. Consequently, the costs are allocated to the gas consumers	0.75
	Non-discriminatory obligations set for involved parties	Not applicable - The obligation is assigned to the market area operator	N/A
	Access to the stored gas not limited to specific uses	THE may sell the procured gas in the wholesale market without limitations. Nevertheless, it may be decided though to keep part of whole of the gas in storage for the subsequent year	1

Contribution to security of supply	Measure's contribution to storage filling levels	Contribution of the measure is significant. THE procured and stored 20% of the storage capacity (50 TWh) in 2022	1
	Measure increased share of stored gas in consumption	Withdrawals from the storages during the winter period of 2022/23 were significantly lower than in 2020 and 2021, following a decrease in consumption. It therefore appears that the measure did increase the use of stored gas	0
Cost estimation	Financing is defined and covers all required costs	The neutrality charge approved by BNetzA includes all the costs that THE incurs for its security of supply activities; procurement of SSBO products, procurement and storage of gas, call orders, financing costs, costs for human and material resources, as well as the revenues from THE's sales of procured gas. The charge is adjusted according to the actual costs and revenues of THE, ensuring its cost neutrality	1
	Effective collection of revenues to cover costs	The neutrality charge is applied to the balancing group managers at all physical exit points of the market area, ensuring collection of the necessary funds	1
	Incentives provided for applying the measure	No incentives or penalties are foreseen for THE	0
Effects on the gas markets	Impact on market competition	THE procured large gas volumes at a period of very high prices in Q3 of 2022. It is very likely that the revenues from selling these quantities will cover just part of the costs, with the rest being recovered through the neutrality charge and therefore increasing prices for end-users	0.5
	Impact on infrastructure congestion	No congestion at the transmission system and storage facilities has been observed due to implementation on the measure	1
	Impact on operation of organized markets	THE has sold only part of the gas it has procured, and will hold significant volumes, around 35 TWh, in storage in 2023/24. Depending on how and when these quantities are released to the market, they could potentially distort prices, providing non-market-based signals, especially if they are sold over a small timeframe. This is an assumption, since there is no evidence of how releasing such quantities could impact the wholesale market	0.5

Hungary

Minimum Volume in Gas Storage (point (a) of the Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	Government Regulation 19/2009 clearly defines the stockholding obligations of MVM	1
	Monitored and verified implementation	MEKH is responsible for monitoring the implementation of the measure	1
	Transparent application and outcomes	MEKH publishes information on the gas stockholding of MVM	1
	Involved parties are aware of their obligation and costs	MVM's obligation is published on MEKH's website by March 1st, of each year, together with the justification for its calculation	1
Non-discriminatory	Non-discriminatory allocation of costs	The costs incurred by MVM are recovered through the regulated tariff for the universal service, and thus are allocated only to households and microenterprises	0.5
	Non-discriminatory obligations set for involved parties	The obligation has been assigned only all universal supply providers (currently there is only a single such supplier)	1
	Access to the stored gas not limited to specific uses	MVM can access the stored gas during the winter period without limitations, to supply its customers within the frame of the universal supply service	1
Contribution to security of supply	Measure's contribution to storage filling levels	Contribution of the measure is significant. The storage obligation in 2022 corresponded to 30% of the storage capacity (19.8 TWh)	1
	Measure increased share of stored gas in consumption	Gas withdrawal in winter of 2022/23 has remained at similar levels with 2020 and lower than 2021. It does not appear that the measure had an impact in increasing use of stored gas	0
Cost estimation	Financing is defined and covers all required costs	The additional costs incurred by MVM for this measure (i.e., costs for storing gas) is included in the regulated tariff for the universal gas supply service	1
	Effective collection of revenues to cover costs	Recovery of costs through the regulated tariff ensures that sufficient revenues will be collected	1
	Incentives provided for applying the measure	A penalty applies if MVM has not met its obligations	1
Effects on the gas markets	Impact on market competition	Since this measure has been in place for a decade, no new effects on the gas market were reported	1
	Impact on infrastructure congestion	The measure did not result in congestion of the transmission system or storage facilities	1
	Impact on operation of organized markets	Since this measure has been in place for a decade, no new effects on the gas market were reported	1

Strategic storage (point (h) of the Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	Act XXVI of 2006 and its amendments define HUSA's stockholding obligations	1
	Monitored and verified implementation	An Oversight Committee, which consists of representatives of the Government, the MEKH and hydrocarbon companies monitor HUSA's activities	1
	Transparent application and outcomes	HUSA regularly publishes at its website the actual level of stocks that it maintains	1
	Involved parties are aware of their obligation and costs	The stockholding obligations are determined in Regulations published by the Minister responsible for Energy Affairs	1
Non-discriminatory	Non-discriminatory allocation of costs	The security stockpiling fee, determined by HUSA, is paid by all gas end-consumers, excluding household consumers	0.5
	Non-discriminatory obligations set for involved parties	Not applicable –Obligation assigned to a state entity	N/A
	Access to the stored gas not limited to specific uses	It appears that the stocks can only be sold to the universal supply providers, based on Regulation by the Minister responsible for Energy Affairs	0
Contribution to security of supply	Measure's contribution to storage filling levels	Contribution of the measure is significant. In 2022 HUSA established stocks corresponding to 30% of the storage capacity (19.8 TWh)	1
	Measure increased share of stored gas in consumption	Gas withdrawal in winter of 2022/23 has remained at similar levels with 2020 and lower than 2021. It does not appear that the measure had an impact in increasing use of stored gas	0
Cost estimation	Financing is defined and covers all required costs	The costs incurred by HUSA are recovered through a security stockpiling fee	1
	Effective collection of revenues to cover costs	Recovery of costs through a fee charged to all consumers ensures that sufficient revenues will be collected	1
	Incentives provided for applying the measure	A penalty applies if MVM has not met its obligations	1
Effects on the gas markets	Impact on market competition	The increase in stockpiling obligations has resulted in an increase of the end-user energy costs	0.5
	Impact on infrastructure congestion	The measure did not result in congestion of the transmission system or storage facilities	1
	Impact on operation of organized markets	As the stockpiling obligation has been in effect for more than a decade, it had no significant new effects on the gas market.	1

Italy

Tender of capacities (point (b) of the Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	ARERA's Resolutions 67/2019/R/gas and Resolution 110/2022/R/gas clearly describe the changes to the capacity auctions (frequency, incentives)	1
	Monitored and verified implementation	Auctions are being carried out in accordance with the rules set by ARERA in its Resolutions. The Ministry is responsible for monitoring the results of the auctions, as well as the weekly trends of storage filling, based on information that is provided by the SSOs	1
	Transparent application and outcomes	The results of the auctions are published by the SSOs	1
	Involved parties are aware of their obligation and costs	The market participants are aware of the terms and conditions for participating in the tenders	1
Non-discriminatory	Non-discriminatory allocation of costs	The SSOs will recover any revenue losses due to the offering of capacity at zero reserve price and not charging part of the operational costs through the transmission tariffs charged to final consumers (excluding cross-border points). Therefore, the costs are allocated to all gas consumers	0.75
	Non-discriminatory obligations set for involved parties	All market participants have access to the auctions, and to the incentives related to the storage charges	1
	Access to the stored gas not limited to specific uses	The incentives provided do not set any limitations to the use of the stored gas	1
Contribution to security of supply	Measure's contribution to storage filling levels	Limited impact. According to ARERA, the contribution of this measure (amending the capacity tendering procedure) to the filling of storages was 7% in 2022.	0.33
	Measure increased share of stored gas in consumption	Withdrawals from the storages during the winter period of 2022/23 corresponded to 21% of gas consumption during that period, lower than that ratio during the period 2017 - 2021, that averaged 27%	0
Cost estimation	Financing is defined and covers all required costs	Compensation of the SSOs (including reimbursement for any revenue loss due to the incentives related to storage charges) is carried out in accordance with the regulated regime for storages, i.e., the maximum allowed revenue charged to final customers through the transmission tariffs	1
	Effective collection of revenues to cover costs	Recovery of costs through the transmission tariffs ensures that sufficient revenues will be collected	1
	Incentives provided for applying the measure	Incentives are provided to market participants for using storage capacity, including zero reserve price was set at the auctions for modulation storage services, and not charging to storage users the costs associated with the technical consumption of the compression and treatment plants	1
Effects on the gas markets	Impact on market competition	Suctions have been used as the mechanism to allocate capacity for several years. The temporary measures related to auctions do not appear to have impacted the gas market	1
	Impact on infrastructure congestion	There was no congestion in the transmission system and storage facilities due to the measure's implementation	1

	Impact on operation of organized markets	The temporary measures were directed to incentivizing market participants to book more capacity, and thus have non-measurable impact on wholesale prices	1
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Balancing stock managed by TSO (point (c1) of the Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	Snam's obligations related to this measure are clearly described in a Ministerial Decree n. 138, 2022 and ARERA's Resolution 165/2022/R/gas	1
	Monitored and verified implementation	ARERA is monitoring the measure's implementation, as part of the overall monitoring of the TSO's obligations and activities	1
	Transparent application and outcomes	Snam published in its website information regarding the purchases of gas to implement this measure, while the costs were reported in the company's half year report for 2022	1
	Involved parties are aware of their obligation and costs	The obligation is clearly described in the above-mentioned resolution, however, further details with respect to the specific volumes required for the transmission system and the storage facilities are not published by Snam	1
Non-discriminatory	Non-discriminatory allocation of costs	The costs incurred by Snam to procure gas and book capacity at the storages are covered as part of the neutrality mechanism for the balancing of the transmission system. The costs are therefore allocated to the gas consumers	0.75
	Non-discriminatory obligations set for involved parties	Not applicable - The obligation is assigned to the TSO	1
	Access to the stored gas not limited to specific uses	Not applicable - The stored gas is limited to the operation of the transmission system and the technical consumption of the SSO	1
Contribution to security of supply	Measure's contribution to storage filling levels	Contribution of the measure is limited. The volumes stored by Snam in 2022 (0.7 bcm) correspond to below 4% of the storage capacity	N/A
	Measure increased share of stored gas in consumption	Withdrawals from the storages during the winter period of 2022/23 corresponded to 21% of gas consumption during that period, lower than that ratio during the period 2017 - 2021, that averaged 27%	0
Cost estimation	Financing is defined and covers all required costs	Snam is compensated for all the costs incurred for the measure, including procurement of gas, booking of capacity, as well as the related financing costs	1
	Effective collection of revenues to cover costs	Recovery of costs through the neutrality mechanism ensures that sufficient revenues will be collected	1
	Incentives provided for applying the measure	No incentives or penalties are explicitly foreseen	1
Effects on the gas markets	Impact on market competition	Gas volumes are procured by the TSO and used only for the operation of the transmission system and storage facilities; therefore, the measure has no impact on the market	1
	Impact on infrastructure congestion	There was no congestion in the transmission system and storage facilities due to the measure's implementation	1

	Impact on operation of organized markets	There is no evidence on the measure's impact on wholesale prices	-
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Obligations imposed on designated entities (point (c2) of the Article 6b(1)) - Appointment of dedicated entity - Point (i) of Article 6b(1)

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	Resolution 274/2022/R/gas and Ministerial Decree n. 287, 2022 clearly describe the obligations of Snam and GSE to provide the task of filling of last resort	1
	Monitored and verified implementation	Monitoring of Snam's obligations for the filling of last resort service is carried out by ARERA and the Ministry. The Ministry is also responsible for monitoring GSE's obligations for the filling of last resort service	1
	Transparent application and outcomes	Volumes procured by Snam and GSE were published in their annual report	1
	Involved parties are aware of their obligation and costs	The obligation of each entity was defined on the basis of the budget allocated to the entity, through the Ministerial Decree (GSE) and ARERA's Resolution (Snam)	1
Non-discriminatory	Non-discriminatory allocation of costs	Both Snam and GSE should be cost neutral from procuring and maintaining the gas stocks. If the revenues from selling the gas are not sufficient to cover their costs, then state funds will be disbursed to cover the deficit.	1
	Non-discriminatory obligations set for involved parties	Not applicable - The obligation is assigned to a state entity and the major TSO	N/A
	Access to the stored gas not limited to specific uses	ARERA has specified the price mechanism for the sales of the gas stocks by Snam and the modalities through which GSE will sell its stocks (60% through forward products and the rest through spot products). There are however no restrictions limiting accessibility of market participants to the sales of these stocks	1
Contribution to security of supply	Measure's contribution to storage filling levels	The volumes procured by Snam in 2022 for the last resort service (1.3 bcm) correspond to 7% of the storage capacity. The volumes procured by GSE correspond to 9% of the GWh. Consequently, this measure provided volumes equivalent to around 16% of the capacity	0.66
	Measure increased share of stored gas in consumption	Withdrawals from the storages during the winter period of 2022/23 corresponded to 21% of gas consumption during that period, lower than that ratio during the period 2017 - 2021, that averaged 27%	0
Cost estimation	Financing is defined and covers all required costs	The costs related to procuring and maintaining the stocks are recognized by ARERA. For Snam the budget for procuring the gas quantities is disbursed by the Cassa, while GSE has received a zero-interest State loan. To ensure neutrality, any outstanding costs/revenues will be settled once the entities sell the procured gas	1
	Effective collection of revenues to cover costs	Any deficit, in case the revenues collected by Snam and GSE from selling the procured gas are not sufficient to cover their costs, will be reimbursed through State funds	1

	Incentives provided for applying the measure	No incentives or penalties are explicitly foreseen	0
Effects on the gas markets	Impact on market competition	Gas stocks will be released in the market ensuring access to all market participants and not affecting competition. Reimbursement for any outstanding costs after Snam and GSE sell the stocks will not be allocated directly to final consumers, and will thus not directly affect gas prices	1
	Impact on infrastructure congestion	There was no congestion in the transmission system and storage facilities due to the measure's implementation	1
	Impact on operation of organized markets	Depending on how and when Snam and GSE release the quantities to the market, they could potentially distort prices, providing non-market based signals, especially if they are sold over a small timeframe. This is an assumption, since there is no evidence of how releasing such quantities could impact the wholesale market	0.5

Financial incentives for market participants (point (f) of the Article 6b(1)) - Stock premium

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The financial incentive is clearly described in Resolution 165/2022/R/gas	1
	Monitored and verified implementation	ARERA is responsible for monitoring the measure, with information provided by Snam	1
	Transparent application and outcomes	No information is published concerning the amounts provided to storage users as stock premium	0
	Involved parties are aware of their obligation and costs	The conditions for receiving the stock premium are defined in ARERA's Regulation. However, the obligations of each storage user that is receiving the premium are not published	0.5
Non-discriminatory	Non-discriminatory allocation of costs	Although Snam pays the stock premium to the storage users, the costs are covered with funds provided by the Cassa, and thus are allocated to all energy consumers	1
	Non-discriminatory obligations set for involved parties	All storage users having booked seasonal and monthly storage products were eligible to receive the subsidy	1
	Access to the stored gas not limited to specific uses	There are no limitations on how the stored gas can be sold in the market	1
Contribution to security of supply	Measure's contribution to storage filling levels	Contribution of the measure is very strong. According to ARERA, it is estimated that the stock premium's contribution corresponds to almost 60% of the volume of gas stored.	1
	Measure increased share of stored gas in consumption	Withdrawals from the storages during the winter period of 2022/23 corresponded to 21% of gas consumption during that period, lower than that ratio during the period 2017 - 2021, that averaged 27%	0
Cost estimation	Financing is defined and covers all required costs	Payments made by Snam to storage users receiving the subsidy are reimbursed by the Cassa, to ensure cost neutrality of Snam	1
	Effective collection of revenues to cover costs	Recovery of costs for the Cassa ensures that sufficient revenues will be collected	1

	Incentives provided for applying the measure	Not applicable - The measure itself is an incentive offered to market participants to book and use storage capacity	N/A
Effects on the gas markets	Impact on market competition	The subsidy provides incentives to market participants utilize their storage capacity, and thus has no effect on market competition	1
	Impact on infrastructure congestion	There was no congestion in the transmission system and storage facilities due to the measure's implementation	1
	Impact on operation of organized markets	There is no evidence on the measure's impact on wholesale prices	-

Financial incentives for market participants (point (f) of the Article 6b(1)) - CfD

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The financial incentive is clearly described in Resolution 189/2022/R/gas	1
	Monitored and verified implementation	ARERA is responsible for monitoring the measure, with information provided by Snam	1
	Transparent application and outcomes	No information is published concerning the use of CfDs	0
	Involved parties are aware of their obligation and costs	The conditions of the CfDs are defined in ARERA's Regulation. However, the obligations of each storage user having signed a CfD are not published	0.5
Non-discriminatory	Non-discriminatory allocation of costs	Payments made by Snam to storage users that hold CfDs are reimbursed by the Cassa, and thus are allocated to all energy consumers	1
	Non-discriminatory obligations set for involved parties	The measure applies to all market participants	1
	Access to the stored gas not limited to specific uses	There are no limitations on how the stored gas can be sold in the market, as long as the filling obligations linked to the CfD are met	1
Contribution to security of supply	Measure's contribution to storage filling levels	Contribution of the measure is immaterial. According to ARERA, interest for CfDs was very limited in the market, contributing to just 1% of the stored gas volumes	0
	Measure increased share of stored gas in consumption	Withdrawals from the storages during the winter period of 2022/23 corresponded to 21% of gas consumption during that period, lower than that ratio during the period 2017 - 2021, that averaged 27%	0
Cost estimation	Financing is defined and covers all required costs	Payments made by Snam to storage users that hold CfDs are reimbursed by the Cassa, to ensure cost neutrality of Snam	1
	Effective collection of revenues to cover costs	Recovery of costs for the Cassa ensures that sufficient revenues will be collected	1
	Incentives provided for applying the measure	Not applicable - The measure itself is an incentive offered to market participants to book and use storage capacity	N/A

Effects on the gas markets	Impact on market competition	Given the very small interest of market participants for CfDs, the measure had no impact on the market	1
	Impact on infrastructure congestion	There was no congestion in the transmission system and storage facilities due to the measure's implementation	1
	Impact on operation of organized markets	Given the very small interest of market participants for CfDs, the measure had no impact on the wholesale prices	1

Strategic storage (point (h) of the Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	Decree-Law n. 164 of 2000 clearly describes the obligations of the SSOs with regards to strategic reserves	1
	Monitored and verified implementation	Monitoring of the SSOs' stockholding obligations is done by the Ministry	1
	Transparent application and outcomes	The SSOs publish information on the volumes of the strategic storage that they maintain each year	1
	Involved parties are aware of their obligation and costs	The strategic storage volumes' obligations of each SSO (both in energy and volumetric units) are published annually by the Ministry, in a relevant statement	1
Non-discriminatory	Non-discriminatory allocation of costs	The costs incurred by the SSOs to establish the strategic storage volumes are recovered through the storage tariffs. However, since these stocks were procured several years ago, no additional costs have to be allocated to final consumers	N/A
	Non-discriminatory obligations set for involved parties	The stockholding obligation has been assigned to all SSOs	1
	Access to the stored gas not limited to specific uses	Not applicable - The strategic storage volumes must remain in storage permanently	N/A
Contribution to security of supply	Measure's contribution to storage filling levels	Contribution of the measure is significant. The strategic storage volumes for storage years 2022/23 and 2023/24 correspond to 25% of the storage capacity (49.3 TWh)	1
	Measure increased share of stored gas in consumption	Not applicable - The strategic storage volumes must remain in storage permanently	N/A
Cost estimation	Financing is defined and covers all required costs	The costs of the SSOs for establishing and maintaining the strategic reserves are recognized in the operator's required revenue	1
	Effective collection of revenues to cover costs	Recovery of costs through the tariffs ensures that sufficient revenues will be collected	1
	Incentives provided for applying the measure	No incentives or penalties are explicitly foreseen	0
Effects on the gas markets	Impact on market competition	The strategic storage volumes have been established since early 2000', thus no current impact of the measure to the market can be considered	1
	Impact on infrastructure congestion	The strategic storage volumes have been established since early 2000', thus no current impact of the measure to the market can be considered	1

	Impact on operation of organized markets	The strategic storage volumes have been established since early 2000', thus no current impact of the measure to the market can be considered	1
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Latvia

Strategic Storage (point (h) of the Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The Energy Law describes the measure	1
	Monitored and verified implementation	The Ministry of Climate and Energy is responsible for monitoring the implementation of the measure	1
	Transparent application and outcomes	It appears that Latvenergo does not publish information on the safety reserves it has established	0.5
	Involved parties are aware of their obligation and costs	The gas volumes that Latvenergo should establish as safety reserves are published in the Energy Law	1
Non-discriminatory	Non-discriminatory allocation of costs	Latvenergo recovers its costs through the State budget, therefore the costs are allocated to all taxpayers	1
	Non-discriminatory obligations set for involved parties	Not applicable –Obligation assigned to a state-owned entity	N/A
	Access to the stored gas not limited to specific uses	Not applicable – Gas remains in storage as strategic reserves	N/A
Contribution to security of supply	Measure's contribution to storage filling levels	Contribution of the measure is limited. Latvenergo's obligation for safety reserves in 2022 corresponded to 9% of the storage capacity (2.2 TWh)	0.33
	Measure increased share of stored gas in consumption	The measure does not impact gas withdrawals as stocks must remain in storage for the whole year	0
Cost estimation	Financing is defined and covers all required costs	Latvenergo covers all its costs, related to the purchase of gas and its transportation through cross-border points, through the State budget	1
	Effective collection of revenues to cover costs	Funding through the State budget ensures efficient recovery of Latvenergo's costs	1
	Incentives provided for applying the measure	Not applicable –Obligation assigned to a state-owned entity	N/A
Effects on the gas markets	Impact on market competition	It appears that implementation of the measure did not affect the market competition	1
	Impact on infrastructure congestion	No information on congestion is available	-
	Impact on operation of organized markets	There is no evidence on the measure's impact on wholesale prices	-

Netherlands

Financial incentives for market participants (point (f) of the Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The Subsidies Regulation clearly describes the subsidy mechanism	1
	Monitored and verified implementation	The RVO is responsible for monitoring implementation of the subsidy. The Ministry is informed in case the subsidy's recipients do not meet their filling obligations	1
	Transparent application and outcomes	The storage users receiving the subsidy are not required to publish information on their filling levels	0
	Involved parties are aware of their obligation and costs	The results of the subsidy scheme on aggregate level (number of participants, volumes awarded, and subsidy granted) are published by the Ministry	0.5
Non-discriminatory	Non-discriminatory allocation of costs	The subsidy is funded through the State budget; therefore, the measure's costs are allocated to all taxpayers	1
	Non-discriminatory obligations set for involved parties	All storage users of UGS Bergermeer have access to the subsidy (apart from entities established outside the EU, with direct or indirect Russian State interests of over 50%)	1
	Access to the stored gas not limited to specific uses	There are no limitations on how the stored gas can be sold in the market, as long as the filling obligations of the storage user receiving the subsidy are met	1
Contribution to security of supply	Measure's contribution to storage filling levels	Contribution of the measure is limited. The subscribed capacity though the subsidy in 2022 corresponded to 9% of the storage capacity (12.7 TWh)	0.33
	Measure increased share of stored gas in consumption	Withdrawals from the storages during the winter period of 2022/23 corresponded to 36% of gas consumption during that period, lower than that ratio during the period 2017 - 2021, that averaged 42%	0
Cost estimation	Financing is defined and covers all required costs	The subsidy scheme is clearly described, and all relevant costs covered from the State budget	1
	Effective collection of revenues to cover costs	Recovery of costs is ensured as the subsidy is funded from the State budget	1
	Incentives provided for applying the measure	Not applicable - The measure itself is an incentive offered to market participants to use storage capacity	N/A
Effects on the gas markets	Impact on market competition	The measure had no measurable effect on the market (due to the positive spread in 2022 the subsidy scheme was not used in practice).	1
	Impact on infrastructure congestion	The measure had no measurable effect on the market (due to the positive spread in 2022 the subsidy scheme was not used in practice).	1
	Impact on operation of organized markets	The measure had no measurable effect on the market (due to the positive spread in 2022 the subsidy scheme was not used in practice).	1

Appointment of dedicated entity (point (i) of the Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The responsibilities of EBN with regards to stockholding are described in the Mining Act	1
	Monitored and verified implementation	Implementation of the measure is monitored by the Ministry of Economic Affairs and Climate Policy	1
	Transparent application and outcomes	The amounts of gas procured by EBN in 2022 were published in its annual report	1
	Involved parties are aware of their obligation and costs	parliament notes are publicly available and describe the obligation of EBN	1
Non-discriminatory	Non-discriminatory allocation of costs	The costs of EBN's activities are covered from State funds, and thus are allocated to all taxpayers	1
	Non-discriminatory obligations set for involved parties	Not applicable - The obligation is assigned to a state entity	N/A
	Access to the stored gas not limited to specific uses	Not applicable - The stocks will remain in storage until the first quarter of 2024	N/A
Contribution to security of supply	Measure's contribution to storage filling levels	Contribution of the measure is limited. In 2022 EBN procured gas quantities corresponding to 9% of the storage capacity (12.2 TWh)	0.33
	Measure increased share of stored gas in consumption	Withdrawals from the storages during the winter period of 2022/23 corresponded to 36% of gas consumption during that period, lower than that ratio during the period 2017 - 2021, that averaged 42%	0
Cost estimation	Financing is defined and covers all required costs	The costs for implementing the measure which are not recovered from gas sales are covered by the State budget. A subsidy is provided to EBN contributing to the management costs (injection, transport, financing cost) and gas procurement. The part of the budget that is not used by EBN to buy gas is returned to the State as dividends.	1
	Effective collection of revenues to cover costs	Recovery of costs is ensured as the subsidy is funded from the State budget	1
	Incentives provided for applying the measure	Not applicable - The obligation is assigned to a state entity	N/A
Effects on the gas markets	Impact on market competition	The gas volumes procured by EBN correspond to a small share of the gas consumption (4%). It can therefore be assumed that any impact of the measure in market competition would be very limited	1
	Impact on infrastructure congestion	No information on the measure's impact on congestion is available	-
	Impact on operation of organized markets	A maximum purchase price and a maximum negative spread has been set for EBN in 2023, so that EBN does not remove gas from the market when prices are high, thus limiting the impact of the measure	1

Poland

Imposed obligations on designated entities (point (c2) of the Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	Chapter 3 of the Act on Stocks clearly describes the measure	1
	Monitored and verified implementation	ERO, the Minister responsible for energy and the TSO, Gaz System, are monitoring implementation of the measure	1
	Transparent application and outcomes	The entities with stockholding obligations do not publish information on their stock levels and related costs	0
	Involved parties are aware of their obligation and costs	ERO publishes in its annual report information on the aggregate stock volume and the number of entities obligated to maintain mandatory stocks. However ex-ante information on the stockholding obligations of the entities is not published	0.5
Non-discriminatory	Non-discriminatory allocation of costs	For entities subject to regulated tariffs, the costs are included in the tariff, and therefore allocated to gas consumers. For suppliers operating in the free market, costs could be recovered from their customers in accordance with each supplier's pricing policy	0.75
	Non-discriminatory obligations set for involved parties	All entities importing gas must establish stocks	1
	Access to the stored gas not limited to specific uses	Not applicable - Stocks have to remain in storage and can only be used following decision from the TSO and the Minister responsible for energy	N/A
Contribution to security of supply	Measure's contribution to storage filling levels	Information on the measure's contribution in 2022/23 is not available. However, in the gas year 2021/22 the stock obligations corresponded to 42% of the storage capacity. It can be assumed that the measure's contribution continues to be significant (as it is the only measure in place in Poland)	1
	Measure increased share of stored gas in consumption	The measure does not impact gas withdrawals as stocks must remain in storage for the whole year	0
Cost estimation	Financing is defined and covers all required costs	For entities subject to regulated tariffs, the costs are included in the tariff, (e.g., suppliers selling gas to households and public utility entities), the costs for establishing and maintaining the reserves are considered as justified costs of the activity and are included in the tariff. For suppliers operating in the free market, costs could be recovered from their customers in accordance with each supplier's pricing policy	1
	Effective collection of revenues to cover costs	Entities recover their costs from the charges to their customers. Thus, recovery of the entities' costs is not secured (e.g., in case the suppliers lose part of their customer base or revenue collection is not fully successful)	0.5
	Incentives provided for applying the measure	Entities that fail to establish mandatory gas stocks are penalized, with a fine corresponding to 250% of the gas shortage value.	1
Effects on the gas markets	Impact on market competition	The measure has been in place for several years. It can be assumed its impact on prices in 2022 did not change compared to the previous years	1

	Impact on infrastructure congestion	No congestion due to the measure was observed	1
	Impact on operation of organized markets	The measure has been in place for several years. It can be assumed its impact on prices in 2022 did not change compared to the previous years	1

Portugal

Minimum volume in gas storage (point (a) of the Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	Decree-Law No. 62/2020 and Ordinance 59/2022 clearly describe the measure	1
	Monitored and verified implementation	REN Gasodutos assumes responsibility for monitoring compliance with the obligations of establishing and maintaining the security and additional reserves, while the TSO reports monthly to the Directorate-General for Energy and Geology and to ERSE, regarding the state of the security and additional reserves	1
	Transparent application and outcomes	The suppliers are not obligated to publish their gas stock levels and the relevant costs	0
	Involved parties are aware of their obligation and costs	Storage volume obligation of each supplier, and relevant costs are not publicly available	0
Non-discriminatory	Non-discriminatory allocation of costs	Not applicable - Each supplier charges its own customers in accordance with its own pricing strategy	N/A
	Non-discriminatory obligations set for involved parties	All suppliers with protected customers and non-interruptible supply to electricity generation have the obligation to store gas according to their customers' consumption	1
	Access to the stored gas not limited to specific uses	Not applicable - The measures are established as security stocks and must be available at all times to be released by the Directorate General for Energy and Geology and ERSE	N/A
Contribution to security of supply	Measure's contribution to storage filling levels	Impact of the measure is significant. In November 2022 the security and additional reserves covered 85% of the storage capacity, amounting 2.7 TWh and 0.35 TWh respectively	1
	Measure increased share of stored gas in consumption	The measure does not impact gas withdrawals, as the reserves have to remain in storage at all times	0
Cost estimation	Financing is defined and covers all required costs	Not applicable - Each supplier charges its own customers in accordance with its own pricing strategy	N/A
	Effective collection of revenues to cover costs	Suppliers recover their costs from the charges to their protected customers. Thus, recovery of the suppliers' costs is not secured (e.g., in case the suppliers lose part of their customer base or revenue collection is not fully successful)	0.5
	Incentives provided for applying the measure	In case does not meet its obligations for maintaining security and additional reserves, it is subject to the ERSE's sanctioning regime	1
Effects on the gas markets	Impact on market competition	Filling the storage to meet the obligations for security and additional reserves reduces the flexibility of the gas system management with operational consequences on the LNG terminal. There were instances where, due to reduced demand, the LNG terminal's storage was full and unloading of LNG carriers was not possible, keeping them in Sine's port for longer than they should.	0.5
	Impact on infrastructure congestion	Most of the storage capacity has to be filled to meet the security and additional reserves' obligations. Capacity is reduced ever further in case a new participant enters the market. As a result, there is shortage of storage capacity for commercial purposes since priority is given to the fulfilment of the security	0

		and additional reserves obligation. In the last years an excess in demand for the capacity reserve auction has occurred. In 2022 the excess was 0,4 TWh.	
	Impact on operation of organized markets	There is no evidence on the measure's impact on wholesale prices	-

Tender of capacities (point (b) of the Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	Ordinance No. 59/2022 and ERSE's Infrastructure access (RARI) clearly define the measure	1
	Monitored and verified implementation	REN Gasodutos assumes responsibility for monitoring	1
	Transparent application and outcomes	The results of the security reserve tenders are published by REN Gasodutos at its website	1
	Involved parties are aware of their obligation and costs	The suppliers are aware of the terms and conditions for participating in the tenders	1
Non-discriminatory	Non-discriminatory allocation of costs	Not applicable - The additional tenders for capacity do not incur substantial costs for the SSO	N/A
	Non-discriminatory obligations set for involved parties	All suppliers with stockholding obligations have access to the tendering of capacity for security and additional reserves	1
	Access to the stored gas not limited to specific uses	The standard terms and conditions of the storage use apply to the capacity offered in the tenders	1
Contribution to security of supply	Measure's contribution to storage filling levels	Not applicable - The measure does not impact storage filling by itself (facilitates booking of capacity for suppliers with stockholding obligations)	N/A
	Measure increased share of stored gas in consumption	Not applicable - The measure does not impact storage filling by itself (facilitates booking of capacity for suppliers with stockholding obligations)	N/A
Cost estimation	Financing is defined and covers all required costs	The costs for carrying out additional auctions are included in the required revenue of the SSO	1
	Effective collection of revenues to cover costs	Costs are recovered through the standard storage tariffs	1
	Incentives provided for applying the measure	Not applicable - The measure does not impact storage filling by itself (facilitates booking of capacity for suppliers with stockholding obligations)	N/A
Effects on the gas markets	Impact on market competition	The measure does not impact the market by itself (facilitates booking of capacity for suppliers with stockholding obligations)	1
	Impact on infrastructure congestion	The measure does not impact the market by itself (facilitates booking of capacity for suppliers with stockholding obligations)	1
	Impact on operation of organized markets	The measure does not impact the market by itself (facilitates booking of capacity for suppliers with stockholding obligations)	1

Romania

Minimum Volume in Gas Storage (point (a) of the Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	ANRE's Order 66/2022 clearly describes the mechanism for stockholding	1
	Monitored and verified implementation	ANRE is responsible for monitoring whether the stockholding obligations are met	1
	Transparent application and outcomes	The entities with stockholding obligations do not publish information on their stock levels and related costs	0
	Involved parties are aware of their obligation and costs	The gas stock obligations assigned to each entity are defined in an Order by ANRE, and published at the websites of ANRE, Transgaz and the SSOs.	1
Non-discriminatory	Non-discriminatory allocation of costs	Not applicable - Each entity recovers its costs from its final consumers according to its own strategy	N/A
	Non-discriminatory obligations set for involved parties	All supplies selling gas to final consumers in Romania undertake stockholding obligations, on the basis of their gas sales	1
	Access to the stored gas not limited to specific uses	The obligations of the entities are to store specific gas quantities by October 31st. After that, there are no limitations on how the entities utilize the stored gas	1
Contribution to security of supply	Measure's contribution to storage filling levels	Contribution of the measure is very strong. For 2023 the obligations of the market participants correspond to 88% of the capacity (29.9 TWh). Together with the stocks maintained in storage by the TSO for balancing purposes (0.6 TWh), the filling level increases to 90%.	1
	Measure increased share of stored gas in consumption	During the winter 2022/2023 gas withdrawal remained at the same level as the previous year, while the share of withdrawn gas to gas demand was higher, due to a decrease in gas consumption. The obligations set to the entities in 2022 were similar to those of previous years, so it can be assumed that the measure did not impact gas withdrawal	0
Cost estimation	Financing is defined and covers all required costs	Not applicable - Each entity recovers its costs from its final consumers according to its own strategy	N/A
	Effective collection of revenues to cover costs	Entities recover their costs from the charges to their customers. Thus, recovery of the entities' costs is not secured (e.g., in case the suppliers lose part of their customer base or revenue collection is not fully successful)	0.5
	Incentives provided for applying the measure	No information available on penalties or incentives applies to entities not meeting their obligations	-
Effects on the gas markets	Impact on market competition	No information available on any impact of the measure on the gas market	-
	Impact on infrastructure congestion	Most of the storage capacity has to be filled, up to a level of around 90%, in order for the entities to meet their obligations. Nevertheless, this did not lead to congestion at the storage facilities, as the stockholding obligations are linked with the suppliers' gas sales over the winter period, therefore additional interest for using the gas storage for commercial purposes is limited	1
	Impact on operation of organized markets	There is no evidence on the measure's impact on wholesale prices	-

Slovakia

Minimum Volume in Gas Storage (point (a) of the Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The Energy Law defines the stockholding obligations within the frame of the supply standard	1
	Monitored and verified implementation	Monitoring of the measure's implementation is carried out by the Ministry of Economy and URSO	1
	Transparent application and outcomes	No information available on whether entities are required to publish their stockholding obligations	-
	Involved parties are aware of their obligation and costs	No information available on whether the Ministry publishes the obligations of each entity	-
Non-discriminatory	Non-discriminatory allocation of costs	The measure is considered a PSO, with net costs recovered through State funds, thus allocated to all taxpayers	1
	Non-discriminatory obligations set for involved parties	All suppliers selling gas to protected consumers in Slovakia, and consumers importing their own supplies have stockholding obligations, in accordance with the respective gas sales / consumption	1
	Access to the stored gas not limited to specific uses	Stored gas concerns implementation of the supply standard. All suppliers applying the standard can use the stored gas to supply their protected customers (no limitations to which of the protected customers the supplier will supply gas to)	1
Contribution to security of supply	Measure's contribution to storage filling levels	No information is available on the application of the measure in 2022/23	-
	Measure increased share of stored gas in consumption	Withdrawals from the storages during the winter period of 2022/23 corresponded to 72% of gas consumption during that period, significantly lower than that ratio during the period 2017 - 2021, that averaged 98%	0
Cost estimation	Financing is defined and covers all required costs	The measure is considered a PSO, and the obligated entities may apply to the Ministry of Economy, to be compensated for any net costs	1
	Effective collection of revenues to cover costs	The recovery of costs through the PSO mechanism from the State budget ensures that any justified claims of the entities will be compensated	1
	Incentives provided for applying the measure	A financial penalty is imposed to entities not meeting their obligations, ranging from 50,000 € to 10,000,000 € depending on the scope of the violation	1
Effects on the gas markets	Impact on market competition	Information not available	-
	Impact on infrastructure congestion	Information not available	-
	Impact on operation of organized markets	Information not available	-

Spain

Minimum volume in gas storage (point (a) of the Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	Royal Decrees 1716/2004 and 6/2022 clearly describe the measure and its application	1
	Monitored and verified implementation	CORES is responsible for monitoring the fulfilment of the gas stockholding obligations assigned to gas suppliers and consumers, with information provided by Enagás GTS	1
	Transparent application and outcomes	The outcomes of the storage capacity auctions are published by the Enagás GTS	1
	Involved parties are aware of their obligation and costs	The mechanism for booking capacity, the obligations of the storage users and the offered discounts are published	1
Non-discriminatory	Non-discriminatory allocation of costs	Not applicable - Each entity recovers its costs according to its own strategy (e.g., suppliers based on their charges to their final consumers)	N/A
	Non-discriminatory obligations set for involved parties	All suppliers selling gas to final consumers in Spain, and consumers for gas not procured from suppliers have stockholding obligations, in accordance with the respective gas sales / consumption	1
	Access to the stored gas not limited to specific uses	For the gas quantities corresponding to 7.5 days of consumption there are no limitations on how the stored gas can be sold in the market, as long as the filling obligation for November 1st is met. The remaining volumes are strategic stocks remaining in storage throughout the year (and therefore for these volumes this criterion is not relevant)	1
Contribution to security of supply	Measure's contribution to storage filling levels	Contribution of the measure is very strong. In 2022 the stockholding obligations of entities corresponded to 83% of the storage capacity (28.3 TWh). For 2023 the share is 87% (30.6 TWh).	1
	Measure increased share of stored gas in consumption	Only a small part of the gas stocks (corresponding to 7.5 days) can be withdrawn after November 1st. In 2022/23 it does not appear that the measure had any impact in the gas withdrawal, as its share of gas demand remained at the same level with the previous couple of years	0
Cost estimation	Financing is defined and covers all required costs	Not applicable - Each entity recovers its costs according to its own strategy (e.g., suppliers based on their charges to their final consumers)	N/A
	Effective collection of revenues to cover costs	Each entity recovers its own costs from its activities. Thus, recovery of the users' costs is not secured (e.g., in case suppliers using the storage lose part of their customer base or revenue collection is not fully successful)	0.5
	Incentives provided for applying the measure	As an incentive to obligated entities, a storage fee of 0 EUR/kWh/day/year applies to the storage capacity necessary for maintaining the minimum operating stocks of the entity (applied only if the entity maintains 100% of its obligation in storage on November 1st). In case the entity does not meet its obligation, apart from losing the discount, a penalty applies (a fine up to 30 mil. EUR, capped to 10% of the offending entity's annual turnover). Furthermore, in case Enagás GTS has	1

		to procure volumes on behalf of the entity, the latter will have to pay imbalance charges	
Effects on the gas markets	Impact on market competition	The increasing use of storage capacity impacted the flexibility of the gas system as a whole. Underground storages were usually used to temporarily give room in LNG storages when a vessel needed to unload at an LNG regasification terminal the tanks of which were full. Due to the limited available underground storage capacity, the TSOs needed to reduce the LNG storage capacity offered to the market.	0.5
	Impact on infrastructure congestion	Most of the storage capacity has to be filled to meet the entities' stockholding obligations. In combination with an increased interest for storage capacity for commercial purposes, due to the provided discounts, demand for capacity exceeded the offered one in 2023	0
	Impact on operation of organized markets	There is no evidence on the measure's impact on wholesale prices	-

Tender of capacities (point (b) of the Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The process for allocating capacity, and the offered discount incentives, are clearly defined in Ministerial Orders	1
	Monitored and verified implementation	CNMC is the entity responsible for supervising the auction process, with information received from Enagás GTS	1
	Transparent application and outcomes	The NRA publishes a report with aggregated data every year with the volumes stored and the level of compliance with obligations.	1
	Involved parties are aware of their obligation and costs	The obligations of the individual storage users are not published. Only the aggregate storage capacity booked is published by Enagás GTS	0.5
Non-discriminatory	Non-discriminatory allocation of costs	Any deficit of the SSO due to the offered discounts at capacity booking is recovered from the State budget. Thus, the costs of the measure are allocated to all taxpayers	1
	Non-discriminatory obligations set for involved parties	All entities with stockholding obligations have access to the open subscription, and subsequently, all market participants have access to the auctions for the remaining capacity	1
	Access to the stored gas not limited to specific uses	There are no limitations on how the stored gas can be sold in the market, as long as the stockholding obligations of the storage user are met	1
Contribution to security of supply	Measure's contribution to storage filling levels	The amount of capacity booked for commercial purposes as a result of the discount incentive offered (with the obligation of maintaining 90% of the capacity on November 1st) is not available	N/A
	Measure increased share of stored gas in consumption	In the winter of 2022/23, it does not appear that the measure had any impact in the gas withdrawal, as its share of gas demand remained at the same level with the previous couple of years	0
Cost estimation	Financing is defined and covers all required costs	All potential deficit in the SSO's revenues due to the offered discounts are compensated through the credit provided to the Ministry for the Ecological Transition and the Demographic Challenge from State budget	1

	Effective collection of revenues to cover costs	Reimbursement of any missing revenues is secured as these are recovered through State funds	1
	Incentives provided for applying the measure	As an incentive for capacity booking, discounts on the storage tariffs are offered (0 EUR/kWh/day/year for maintaining the minimum operating stocks of the entity and zero reserve price for commercial use of the capacity). The discounts are not applied in case the storage user does not meet its obligations (in which case the standard tariffs apply)	1
Effects on the gas markets	Impact on market competition	Due to the small use of storage capacity for commercial purposes it appears that the measure's impact on the market is insignificant	1
	Impact on infrastructure congestion	With the incentives provided for yearly storage capacity, the market reacted showing more interest in using gas storage. As the capacity available for commercial use was limited, due to the high-capacity needs for storing the gas stocks, increased demand produced premiums in some capacity products	0
	Impact on operation of organized markets	Due to the small use of storage capacity for commercial purposes it can be assumed that the wholesale prices were not impacted	1

Unused booked capacities (point (g) of the Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	A Resolution by CNMC clearly defines the capacity oversubscription and buy-back mechanism	1
	Monitored and verified implementation	CNMC is responsible for monitoring the application of congestion management procedures, including the OSBB mechanism	1
	Transparent application and outcomes	In case the buy-back procedure is applied, Enagás GTS must publish the capacity requested, the aggregate offers from storage users and the results of the procedure	1
	Involved parties are aware of their obligation and costs	The storage booking process through the OSBB is transparent to all market participants	1
Non-discriminatory	Non-discriminatory allocation of costs	Any costs of the SSO are allocated to gas consumers, as they are socialized in the storage tariff	0.75
	Non-discriminatory obligations set for involved parties	The OSBB mechanism is open to all market participants interested to book storage capacity	1
	Access to the stored gas not limited to specific uses	Not applicable - The measure concerns storage capacity and not gas volumes	N/A
Contribution to security of supply	Measure's contribution to storage filling levels	The OSBB mechanism has not been put in place yet (expected later in 2023)	-
	Measure increased share of stored gas in consumption	The OSBB mechanism has not been put in place yet (expected later in 2023)	-
Cost estimation	Financing is defined and covers all required costs	The costs for the OSBB mechanism will be included in the calculation of the storage tariff	1
	Effective collection of revenues to cover costs	Recovery of costs through the storage tariffs ensure that sufficient revenues will be collected	1
	Incentives provided for applying the measure	Not applicable – the measure itself is a penalty for the storage user	N/A

Effects on the gas markets	Impact on market competition	The OSBB mechanism has not been put in place yet (expected later in 2023)	-
	Impact on infrastructure congestion	The OSBB mechanism has not been put in place yet (expected later in 2023)	-
	Impact on operation of organized markets	The OSBB mechanism has not been put in place yet (expected later in 2023)	-

Strategic Storage (point (h) of the Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	Royal Decrees 1716/2004 and 6/2022 clearly describe the measure and its application	1
	Monitored and verified implementation	CORES is responsible for monitoring the fulfilment of the gas stockholding obligations assigned to gas suppliers and consumers, with information provided by Enagás GTS	1
	Transparent application and outcomes	The entities with stockholding obligations are not obligated to publish their gas stock levels and the relevant costs	0
	Involved parties are aware of their obligation and costs	No information is published, by CORES or Enagás GTS, with regards to the entities stockholding obligations and whether these have been achieved	0
Non-discriminatory	Non-discriminatory allocation of costs	Not applicable - Each entity recovers its costs according to its own strategy (e.g., suppliers based on their charges to their final consumers)	N/A
	Non-discriminatory obligations set for involved parties	All suppliers selling gas to final consumers in Spain, and consumers for gas not procured from suppliers have stockholding obligations, in accordance with the respective gas sales / consumption	1
	Access to the stored gas not limited to specific uses	Not applicable - The strategic security stocks and the minimum operating stocks of the system remain in storage throughout the year	N/A
Contribution to security of supply	Measure's contribution to storage filling levels	Contribution of the measure is very strong. In 2022 the stockholding obligations of entities corresponded to 59% of the storage capacity (20.6 TWh). For 2023 the share is 64% (22.3 TWh). These amounts overlap with the overall stockholding obligations of the entities.	1
	Measure increased share of stored gas in consumption	Not applicable- The measure does not impact gas withdrawals as stocks must remain in storage for the whole year	N/A
Cost estimation	Financing is defined and covers all required costs	Not applicable - Each entity recovers its costs according to its own strategy (e.g., suppliers based on their charges to their final consumers)	N/A
	Effective collection of revenues to cover costs	Each entity recovers its own costs from its activities. Thus, recovery of the users' costs is not secured (e.g., in case suppliers using the storage lose part of their customer base or revenue collection is not fully successful)	0.5
	Incentives provided for applying the measure	In case the entity does not meet its obligation, a penalty applies (a fine up to 30 mil. EUR, capped to 10% of the offending entity's annual turnover). Furthermore, in case Enagás GTS has to procure volumes on behalf of the entity, the latter will have to pay imbalance charges	1

Effects on the gas markets	Impact on market competition	The level of strategic security stocks and the minimum operating stocks of the system has remained at 20 days of consumption, as it was in the previous year. Therefore, impacts on the storage market cannot be attributed to this measure (but rather to the additional 7.5 days of consumption introduced in 2022)	1
	Impact on infrastructure congestion	The level of strategic security stocks and the minimum operating stocks of the system has remained at 20 days of consumption, as it was in the previous year. Therefore, congestion cannot be attributed to this measure (but rather to the additional 7.5 days of consumption introduced in 2022)	1
	Impact on operation of organized markets	There is no evidence on the measure's impact on wholesale prices	-

Appointment of dedicated entity (point (i) of the Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The Royal Decree 6/2022 clearly describes the measure and the relevant obligations of Enagás GTS	1
	Monitored and verified implementation	No specific entity is monitoring the measure. Nevertheless, Enagás GTS reports periodically to CNMC and the Ministry on the actions it has undertaken	0.5
	Transparent application and outcomes	Enagás GTS does not have an obligation to publish information concerning the procurement of gas volumes and the associated costs, within the frame of this measure	0
	Involved parties are aware of their obligation and costs	Enagás GTS is informed of its obligations only on a case-by-case basis, in accordance with information provided by CORES. These obligations are not published	0
Non-discriminatory	Non-discriminatory allocation of costs	Not applicable - The entity not meeting its obligations compensates Enagás GTS through the payment of imbalance charges. However, the way the entity then recovers these costs from its customers depends on its pricing policy	N/A
	Non-discriminatory obligations set for involved parties	Not applicable - The obligation is assigned to Enagás GTS in its capacity as technical manager of the system	N/A
	Access to the stored gas not limited to specific uses	Enagás GTS procures gas on behalf of the entity not meeting its obligations. These quantities are made available to the entity as all other gas stocks (i.e., for the gas quantities corresponding to 7.5 days of consumption there are no limitations on how the stored gas can be sold in the market, as long as the filling obligation for November 1st is met)	1
Contribution to security of supply	Measure's contribution to storage filling levels	The measure has not been triggered yet (no entities were in breach of their stockholding obligations)	0
	Measure increased share of stored gas in consumption	The measure has not been triggered yet (no entities were in breach of their stockholding obligations)	0
Cost estimation	Financing is defined and covers all required costs	The costs incurred by Enagás GTS are recovered through the imbalance charges mechanism	1
	Effective collection of revenues to cover costs	Recovery of costs through the imbalance charges ensure that sufficient revenues will be collected	1

	Incentives provided for applying the measure	No incentives or penalties are provided to Enagás GTS	0
Effects on the gas markets	Impact on market competition	Not applicable - The measure has not been applied as no entities were in breach of their stockholding obligations	-
	Impact on infrastructure congestion	Not applicable - The measure has not been applied as no entities were in breach of their stockholding obligations	-
	Impact on operation of organized markets	Not applicable - The measure has not been applied as no entities were in breach of their stockholding obligations	-

Discounts on storage tariffs (point (j) of the Article 6(b)(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The offered discount incentives, are clearly defined in Ministerial Orders	1
	Monitored and verified implementation	CNMC is the entity responsible for supervising the auction process, with information received from Enagás GTS	1
	Transparent application and outcomes	Storage users do not publish information on whether they meet their obligations (either for gas stocks or for commercial gas to receive discounts) and the underlying costs. The outcomes of the auctions at which the discounted capacity was allocated are published by the SSO	0.5
	Involved parties are aware of their obligation and costs	The specific obligation of each storage user (90% of its booked capacity on November 1st) in order to receive the discount is not published by Enagás GTS, but the aggregate storage bookings are	0.5
Non-discriminatory	Non-discriminatory allocation of costs	Any deficit of the SSO due to the offered discounts at capacity booking is recovered from the State budget. Thus, the costs of the measure are allocated to all taxpayers	1
	Non-discriminatory obligations set for involved parties	All users may receive the tariff discounts, provided that they meet their obligations	1
	Access to the stored gas not limited to specific uses	There are no limitations on how the stored gas can be sold in the market, as long as the stockholding obligations of the storage user are met	1
Contribution to security of supply	Measure's contribution to storage filling levels	The amount of capacity booked for commercial purposes as a result of the discount incentive offered (with the obligation of maintaining 90% of the capacity on November 1st) is not available	N/A
	Measure increased share of stored gas in consumption	In the winter of 2022/23, it does not appear that the measure had any impact in the gas withdrawal, as its share of gas demand remained at the same level with the previous couple of years	0
Cost estimation	Financing is defined and covers all required costs	Offering of a discount does not incur additional costs for the SSO, but may result in revenue losses, which are compensated through the credit provided to the Ministry for the Ecological Transition and the Demographic Challenge from State budget	1
	Effective collection of revenues to cover costs	Reimbursement of any missing revenues is secured as these are recovered through State funds	1

	Incentives provided for applying the measure	The measure itself is an incentive offered to market participants to book and use storage capacity	1
Effects on the gas markets	Impact on market competition	The discount on storage capacity tariffs is an incentive to increase booking and utilization of capacity to be booked for commercial purposes. This it has no effect on market competition and operation	1
	Impact on infrastructure congestion	With the incentives provided for yearly storage capacity, the market reacted by showing more interest in using gas storage. As the capacity available for commercial use was limited, due to the high-capacity needs for storing the gas stocks, increased demand produced premiums in some capacity products	0
	Impact on operation of organized markets	The discount on storage capacity tariffs is an incentive to increase booking and utilization of capacity to be booked for commercial purposes. This it has no effect on the market participants' behaviour in the wholesale prices	1

Sweden

Appointment of dedicated entity (point (i) of the Article 6b(1))

Criterion	Sub-criterion	Justification	Rating
Clearly defined, verifiable, transparent	Clearly defined measure and application approach	The amendments to the Natural Gas Act and the Security of Supply Act determine the mechanism for implementing the measure	1
	Monitored and verified implementation	The Energy Markets Inspectorate is responsible for monitoring the measure's implementation, receiving information from Swedegas regarding the filling levels	1
	Transparent application and outcomes	The balance administrators are not obligated to publish their gas stock levels and the relevant costs	0
	Involved parties are aware of their obligation and costs	Swedegas is not required to publish the stockholding responsibilities of each balance administrator (or the aggregate responsibility of all balance administrators), in case the measure is triggered	0
Non-discriminatory	Non-discriminatory allocation of costs	Not applicable – Each balance administrator charges its own customers in accordance with its own pricing strategy	N/A
	Non-discriminatory obligations set for involved parties	The obligation, if the measure is triggered, is allocated to all balance administrators, on the basis of their market share	1
	Access to the stored gas not limited to specific uses	There are no limitations on how the stored gas can be sold in the market, as long as the filling obligations of the storage user are met	1
Contribution to security of supply	Measure's contribution to storage filling levels	The measure has not been triggered yet (all storage capacity is booked until April 2024)	0
	Measure increased share of stored gas in consumption	The measure has not been triggered yet (all storage capacity is booked until April 2024)	0
Cost estimation	Financing is defined and covers all required costs	Not applicable – Each balance administrator charges its own customers in accordance with its own pricing strategy	N/A
	Effective collection of revenues to cover costs	Balance administrators recover their costs from the charges to their customers. Thus, recovery of the costs is not secured (e.g., in case a balance administrator loses part of its customer base or revenue collection is not fully successful)	0.5
	Incentives provided for applying the measure	Balance administrators not fulfilling the requirements set by Swedegas must pay corresponding imbalance charges	1
Effects on the gas markets	Impact on market competition	The measure has not been triggered yet (all storage capacity is booked until April 2024)	-
	Impact on infrastructure congestion	The measure has not been triggered yet (all storage capacity is booked until April 2024)	-
	Impact on operation of organized markets	The measure has not been triggered yet (all storage capacity is booked until April 2024)	-