ACER
European Union Agency for the Cooperation of Energy Regulators

Report on Gas Storage Regulation and Indicators

07 April 2022

Abbreviations/definitions:	
AGSI+	Aggregated Gas Storage Inventory Platform (https://agsi.gie.eu/#/)
BSU	Bundled Standard Unit
BSV	Booked Storage Volume (in TWh)
GIS	Gas in Storage (in TWh)
UGS	Underground Gas Storage
SSO	Storage System Operator
WGV	Working Gas Volume (in TWh)
WSO	Winter Supply Outlook
Winter Season: October until March	

1. INTRODUCTION

1.1 Background

ENTSOG Winter Supply Outlook ('WSO') 2021 - 2022[1] data[2] on the storage filling level on 1 October 2021 raises several questions regarding data completeness[3], its validity[4] and the interpretation of the varying filling levels across UGS in the Union (EU-27).

In March 2022, the European Commission published its communication REPowerEU[5] which highlights the need to be prepared for a possible interruption of gas supply. Gas storage plays an important role for ensuring continuity of gas supply. More recently, the Commission has tabled a legislative proposal[6] introducing a minimum of 80% gas storage level obligation by 1 November for next winter, rising to 90% for the following years. EU leaders are expected to discuss and decide soon on the approach to refill Europe's storage facilities.

This ACER report sets out the current storage situation across the EU Member States ('MS') and is based on information provided by energy national regulatory authorities ('NRAs').

1.2 Objectives

The main aim of this Report is to get an updated snapshot gas storage regulation and indicators in the Union. This Report aims to:

- get clarity and verify the UGS levels (working gas volume, booked storage volume, gas in storage) used in ENTSOG's WSO 2021/22;

[1] https://www.entsog.eu/sites/default/files/2021-10/SO0032-21_Winter%20Supply%20Outlook_2021-22_Final%20.pdf
[2] Figure 11.
[3] The database is the GIE AGSI+ platform which presents storage data collected from SSOs on a voluntary basis.
[4] E.g. adding filling levels per country from data in Figure 11 does not allow to reproduce the ENTSOG level of 831 TWh for EU (also including the UK value of 9.4 TWh).
[5] https://ec.europa.eu/commission/presscorner/detail/en/ip_22_1511
[6] https://energy.ec.europa.eu/proposal-regulation-gas-storage_en

- collect general information on the type of UGS regulation (access regime, tariff regime and capacity products);
- where applicable, collect information on storage obligations.

CEER has recently developed a Paper on the regulation of long-term gas storage covering methodological orientations for addressing storage from a regulatory perspective and factors influencing the type of regulatory intervention[7]. The CEER Paper also includes a detailed description of the storage regulation in selected countries (Austria, Czechia, France, Italy, Germany, Spain and Great Britain).

Existing storage regulations bring useful experiences to underpin new policies for filling storages for next winter. This ACER Report complements CEER's paper by offering updated statistical information on the type of storage regulation and indicators for all the 18 EU MS with storage facilities.

1.3 Information provided by NRAs

The Report in mainly built based on information provided by NRAs until 28 January 2022. All 18 NRAs with UGS submitted a questionnaire on gas storages: Austria, Belgium, Bulgaria, Croatia, Czechia, Denmark, France, Germany, Hungary, Italy, Latvia, Netherlands, Poland, Portugal, Romania, Slovakia, Spain and Sweden. Detailed NRAs responses are provided in the Annex to the Report.

2. MAIN FINDINGS

The Report aims to cover all UGS available in the territory of the Union, including the UGS for low-calorific gas ('L-gas') in the Netherlands, Germany and France[8].

2.1 General storage indicators

UGS Situation on 1 October 2021

Table 1 presents some general indicators regarding the gas storage situation in the Union. On 1 October 2021, the average filling level amounted to 72%[9]. The total EU-27 storage working gas volume ('WGV') capacity is 1,141 TWh or approximately 27% of the annual gas consumption in the EU-27. The 9 MS without UGS assets represent less than 5% of EU-27 annual gas consumption. The actual gas in storage on 1 October 2021 represents nearly 20 % of the EU-27 annual gas consumption. The situation varies across the MS with UGS. Two MSs have a storage capacity larger than their national gas consumption (Austria and Latvia), and are used at regional level (e.g. serve Southern Germany and the Baltics, respectively). Gas storage supplies 25-30% of the gas consumed during winter.

Table 1. EU-27 general storage indicators.

[7] https://www.ceer.eu/2265
[8] The total WGV of L-gas storage (winter 2021-2022) amounts to approximately 95.7 TWh (Netherlands 65.0 TWh, Germany 17.5 TWh and France 13.4 TWh) corresponding to 8.4% of total gas storage in terms of WGV in EU-27. Source: "L-gas Market Conversion Report, Winter Report 2022, Task Force L-gas Market Conversion Monitoring", forthcoming www.rijksoverheid.nl). There is an ongoing market conversion programme to convert the L-gas market to high-calorific (H-gas) gas by 2030 in which current L-gas storages may be converted to H-gas.
[9] After an update from the German NRA of the data published on AGSI+ platform.

NRA from MS	CON -Annual Gas Consumption [TWh]	WGV (WGV)* [TWh]	GIS [TWh]	GIS/WGV [%]	WGV/CON [%]	GIS/CON [%]
Austria	93.29	95.48 (95.2)	51.13	53.6%	102.3%	54.8%
Belgium (**)	193.50	9.00 (9.0)	7.85	87.2%	4.7%	4.1%
Bulgaria	32.50	6.27 (10.6)	4.42	70.5%	19.3%	13.6%
Croatia	33.62	5.22 (5.5)	4.70	90.0%	15.5%	14.0%
Czechia (***)	94.03	36.07 (44.4)	27.89	77.3%	38.4%	29.7%
Cyprus	0.00	0.00	0.00			
Denmark	31.35	9.08 (10.5)	7.50	82.6%	29.0%	23.9%
Estonia	4.50	0.00	0.00			
Finland	25.97	0.00	0.00			
France	451.10	128.46 (136.4)	118.56	92.3%	28.5%	26.3%
Germany(****)	962.12	274.72 (266.4)	156.31	56.9%	28.6%	16.2%
Greece	63.14	0.00 (3.9)	0.00			
Hungary	113.15	67.70 (69.6)	56.66	83.7%	59.8%	50.1%
Ireland	58.75	0.00	0.00			
Italy	750.57	197.73 (244.7)	169.33	85.6%	26.3%	22.6%
Latvia	11.73	21.80 (24.2)	17.41	79.9%	185.8%	148.4%
Lithuania	26.23	0.00	0.00			
Malta	4.11	0.00	0.00			
Luxemburg (**)	8.09	0.00	0.00			
Netherlands	408.11	143.81 (144.6)	84.10	58.5%	35.2%	20.6%
Poland	219.99	35.79 (49.1)	34.47	96.3%	16.3%	15.7%
Portugal	66.81	3.57 (3.6)	1.78	49.9%	5.3%	2.7%
Romania	127.35	32.99 (45.5)	23.94	72.6%	25.9%	18.8%
Slovakia	52.64	38.75 (47.1)	27.87	71.9%	73.6%	52.9%
Slovenia	9.71	0.00	0.00			
Spain	360.83	34.25 (34.2)	25.09	73.3%	9.5%	7.0%
Sweden	14.57	0.01 (0.1)	0.01	66.3%	0.1%	0.0%
EU-27 TOTAL	**4217.76**	**1140.70 (1244.5)**	**819.02**	**71.8%**	**27.0%**	**19.4%**

* WGVs between brackets ( ) present values informed by GIE and are for MSs slightly higher than the WGV available at the GIE AGSI+ platform. AGSI+ platform collects information from SSOs on a voluntary basis, and a few SSO are not covered. By comparing the total EU-27 WGV so far validated by the NRAs (1140.7 TWh which contains already a correction of AGSI+ data on 1/10/2021) with the GIE data of the actual situation (1244.5 TWh, on 23/02/2022), one may conclude that coverage rate of the EU-27 WGV amounts to 91.7%. There is still 103.8 TWh storage capacity in the EU-27 not covered when this Report was drafted. GIE informed in early March 2022 that more SSOs are willing to report to AGSI+ platform; in the future, storage coverage in terms of WGV may reach ~ 97%,

** Belux total from ACER MMR 2020 is split between Belgium & Luxembourg based on CREG and ILR published consumption (creg.be; ilr.lu)

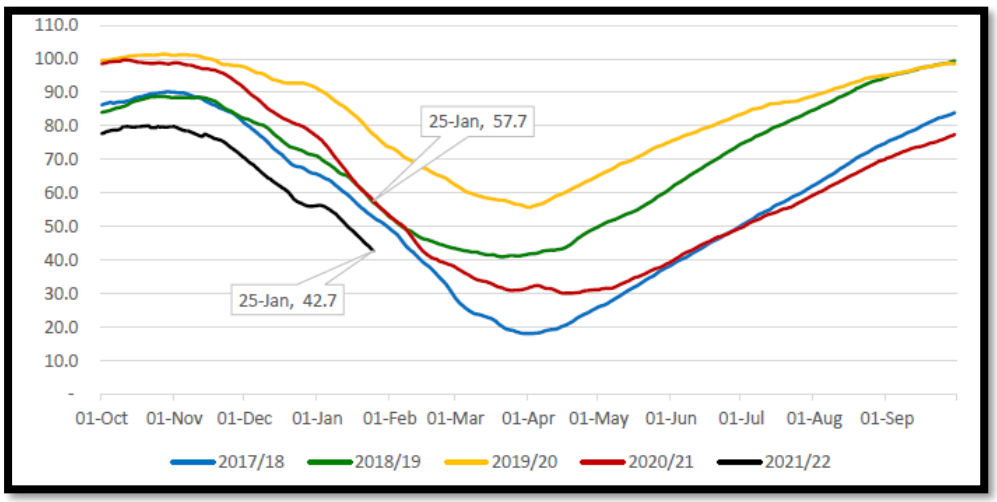
*** The Czech NRA corrected WGV and GIS volumes

****The German NRA corrected WGV from 230.31 TWh to 274.72 TWh

Sources: EU-27 consumption data from ACER MMR 2020. Storage data from https://agsi.gie.eu/#/ on 1/10/2021.

Use of UGS during last 5 years

UGS plays an important role to balance the European gas system and to cover peak demand during winter. Gas storages play an important role for ensuring continuity of gas supply; they are an important source of gas flexibility during the winter and are refilled during the summer period. The role of storages becomes more relevant in a context where the EU indigenous gas production consistently declines year on year, increasing the gas import dependency from external gas producers to the EU. The UGS inventory level on 1 October 2021 is the lowest of the past 5 years, and it has continued below the average during the winter 2021/22. This is primarily due to a low storage level at the end of last winter 2020/21, combined with a storage injection season characterised by extremely high gas wholesale prices which did not incentivize market participants to store gas in comparison to previous years[10].



[10] As of 4 November 2021, the % filling storage level of UGS Haidach - GSA (AT) is 2%, UGS Haidach -Astora (AT) 55%, UGS Rehden (DE) 9.5% and UGS Bergermeer (NL) 30%. However, the average % filling storage level is 56% in Austria, 71% in Germany and 58% in the Netherlands. Source: GIE AGSI+ platform, accessed on 4 November 2021. Source: ACER Opinion No 11-2021 on Winter Supply Outlook 2021/22 and AGSI+ Platform.

Figure 1. European gas storage inventory (bcm).

Source: OIES, Quarterly Gas Review. Feb. 2022 based on AGSI+ platform data.

2.2 UGS capacity and types

Most gas storage capacity in the EU corresponds to depleted and aquifers fields (Table 2), which are mainly used to store large volumes of gas to balance seasonal swings of gas demand and to the extent possible also for short-term trading and balancing. All MS but Portugal and Sweden report having depleted and/or aquifers storage sites. In addition, **8 MS count with salt and hard rock caverns storages,** representing a low but varying percentage of the total storage capacity. Caverns are primarily used to optimise gas portfolios in the short-term as they typically allow for several gas injection and withdrawal cycles per year. In Portugal, salt caverns allow for multiple uses, including seasonal storage. Salt and hard rock caverns are available in Czechia (2% of total storage capacity), Denmark (45%), France (10%), Germany (50%), Netherlands (3%), Poland (26%) and Portugal (100%). This information is generally consistent with GIE data (see Table 3) which contains details on the WGV capacity per type of storage.

Table 2. Storage types in EU-27, as reported by NRAs.

	Seasonal Storage			Used mainly for Short-term trading[11]
NRA from MS	depleted field	aquifer	depleted field + aquifer	salt / hard rock cavern
Austria	100%			
Belgium		100%		
Bulgaria			100%	
Croatia	100%			
Czechia			98%	2%
Cyprus				
Denmark		55%		45%
Estonia				
Finland				
France		90%		10%
Germany[12]			43%	50%
Greece				
Hungary	100%			
Ireland				
Italy	100%			

[11] Salt caverns are very flexible and allow for seasonal and short-term trading. E.g. In Portugal, salt caverns allow for multiple uses, including seasonal storage.
[12] The missing 7% are commercial storage zones consisting of both types of storages. BnetzA has no information about the exact volume for the different types in these storage zones.

Latvia		100%		
Lithuania				
Malta				
Luxemburg				
Netherlands	97%			3%
Poland	74%			26%
Portugal				100%
Romania	100%			
Slovakia	100%			
Slovenia				
Spain	84%	16%		
Sweden				100%
EU-27 TOTAL	**9**	**5**	**3**	**8**

Table 3. Technical Working Gas Volume of operational underground gas storage facilities by type per country (based on territorial location of storage). Source: GIE, preliminary data as of 10/3/2022.

MS	Aquifer	Depleted field	Rock Cavern	Salt cavern	VGS - multiple types (*)	Total WGV [TWh]
Austria		95.5				95.5
Belgium	9.0					9.0
Bulgaria		5.8				5.8
Croatia		5.2				5.2
Czech Republic	(1.9)	40.4 (33.4)	0.8	1.9 (0)		43.1 (36.1)
Denmark	5.9			5.0		10.8
France	122.0			11.4		133.4
Germany	4.4	85.7		157.8	12.2	260.0
Greece						0.0
Hungary		69.6				69.6
Italy		195.4				195.4
Latvia	24.2					24.2
Netherlands		140.1		4.5		144.6
Poland		26.6		9.2		35.8
Portugal				3.6		3.6
Romania		33.0				33.0
Slovakia		43.4				43.4
Spain	12.0	22.3				34.2
Sweden			0.1			0.1
Total EU-27	**177.4**	**763.0**	**0.9**	**193.3**	**12.2**	**1146.8**
	15%	**67%**	**0%**	**17%**	**1%**	**100%**

In ( ) values provided by the Czech NRA. It excludes UGS Dolni Bojanovice which is located in Czechia but connected only to the Slovak gas grid.

(*) "Virtual Gas Storage (VGS)-multiple types" includes cumulated WGV for storage sites of different type of geological storages (aquifer, depleted fields, salt caverns, etc.). GIE values are provided based on the territorial location of storages. Some storage sites in Czechia and Austria are connected to grids in neighbouring MS. For detailed information on UGS sites, see GIE database https://www.gie.eu/transparency/databases/storage-database/. The Annex to this report (Q8) contains the NRAs replies on the UGS capacity per type in EU-27. In most cases, GIE information is consistent with the information provided by NRAs.

2.3 Type and description of storage regulation

NRAs reported on the type of storage regulation applicable, by choosing among 4 options: market-based approach; revenue reconciliation; storage obligations; strategic storage; and others.

Table 4. Type of storage regulation in EU-27.

NRA from MS	1.Market-based approach[13]	2.Revenue reconciliation[14]	3.Storage obligations[15]	4.Strategic storage[16]	5.Others	Total
Austria	X					1
Belgium	X					1
Bulgaria	X		x			2
Croatia		x				1
Czechia	X		x			2
Denmark	X					1
France		x	X			2
Germany	X					1
Hungary	X		x	x		3
Italy		x		x		2
Latvia	X					1
Netherlands	X					1
Poland			x		x	2
Portugal		x	x	x		3
Romania			x			1
Slovakia	X					1
Spain[17]			x			2

[13] 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.
[14] Revenue reconciliation: storage operators receive additional revenues if the difference between market revenues and regulated income is negative.
[15] Storage obligations: Gas suppliers are required by regulation to keep a percentage of annual gas suppliers in storage, guaranteeing more steady revenue stream for operators as use of storage services is imposed.
[16] Strategic storage: storage operators dedicate a certain share of storage to strategic storage, which is not commercially available and which costs are socialised among market participants.
[17] Storage obligations for suppliers for strategic and operative reserves. The capacity is allocated in a first step directly to users, according to their request; the remaining capacity (the one not allocated by the direct allocation mechanism) is offered though market auctions.

NRA from MS	1.Market-based approach[13]	2.Revenue reconciliation[14]	3.Storage obligations[15]	4.Strategic storage[16]	5.Others	Total
Sweden	X			x		2
18	**12**	**4**	**8**	**4**	**1**	
	67%	**17%**	**44%**	**22%**	**6%**	

In the majority of MS (12 of the 18 MS with UGS) storage regulation follows a **market based-approach**, followed by **storage obligations** (8 MSs) and **revenue reconciliation** (4 MSs). Only 4 MS (Italy, Hungary for part of its UGS capacity, Portugal and Sweden) have **strategic storage**. Nearly half of the MSs with UGS have chosen two options as applicable. Some NRAs with regulated storage use a market-based approach (auctions) for the allocation of storage capacity. In Poland, the entity[18] obliged to maintain mandatory stocks of natural gas has a freedom to choose the formula and place for maintaining mandatory stocks, either on the territory of Poland or abroad. Storage regulation is complex and it is not always straightforward to categorise the type of storage regulation. Therefore, the responses on the type of storage regulation should be carefully read in conjunction with the description of the storage regulation (see Annex, replies to Q2).

NRAs have described the main features of national storage regulation, providing insights into key regulatory aspects, such as the use of auction mechanisms to allocate capacity, the type of regulation to set allowed revenues, as well as on the number of storage sites and operators. The availability and number of storage sites and operators differs per MS: some countries only have 1 UGS, others have several storages operated by the same SSO, while in others (e.g. Italy with 13 UGS operated by 3 SSOs, and France with 16 UGS owned by 3 SSOs) numerous UGS sites are operated by different SSOs.

There is a variety of schemes applied for UGS regulation across the 18 MS with storage sites (see Table 5, and Figure 2). In 11 MS, storage is regulated based on third-party access ('TPA') and regulated tariffs. In the remaining 7 MSs, access to storage is negotiated based on transparent and non-discriminatory rules. In one MS (Hungary), there is transparent and non-discriminatory negotiated access for all commercial storages and, in addition, there is also an independent strategic storage operator. Slightly more than half (52.4%) of the Union gas storage capacity falls under a negotiated regime, and a bit less is under a regulated TPA regime.

[18] 1) Undertakings engaged in the business of trading natural gas with foreign countries, and 2) end users importing natural gas from abroad.

Table 5. Regulated vs. negotiated TPA storage regimes in EU-27.

NRA from MS	rTPA	nTPA	rWGV	nWGV
Austria		1		95.48
Belgium	1		9.00	
Bulgaria	1		6.27	
Croatia	1		5.22	
Czechia		1		36.07
Cyprus				
Denmark		1		9.08
Estonia				
Finland				
France	1		128.46	
Germany(**)		1		274.72
Greece				
Hungary	1		67.70	
Ireland				
Italy	1		197.73	
Latvia	1		21.80	
Lithuania				
Malta				
Luxemburg				
Netherlands		1		143.81
Poland	1		35.79	
Portugal	1		3.57	
Romania	1		32.99	
Slovakia		1		38.75
Slovenia				
Spain	1		34.25	
Sweden		1		0.01
EU-27 TOTAL	**11**	**7**	**542.78**	**597.92**
			47.6%	52.4%

This table informs of the access rules to storage: regulated or negotiated. See Table 8 for the tariff setting regime.

*Belux total from ACER MMR 2020 is split in Be & Lux based on consumption published by CREG and ILR (creg.be; ilr.lu)

** The German NRA corrected WGV from 230.31 TWh to 274.72 TWh.

*** The Czech NRA corrected WGV and GIS volumes.

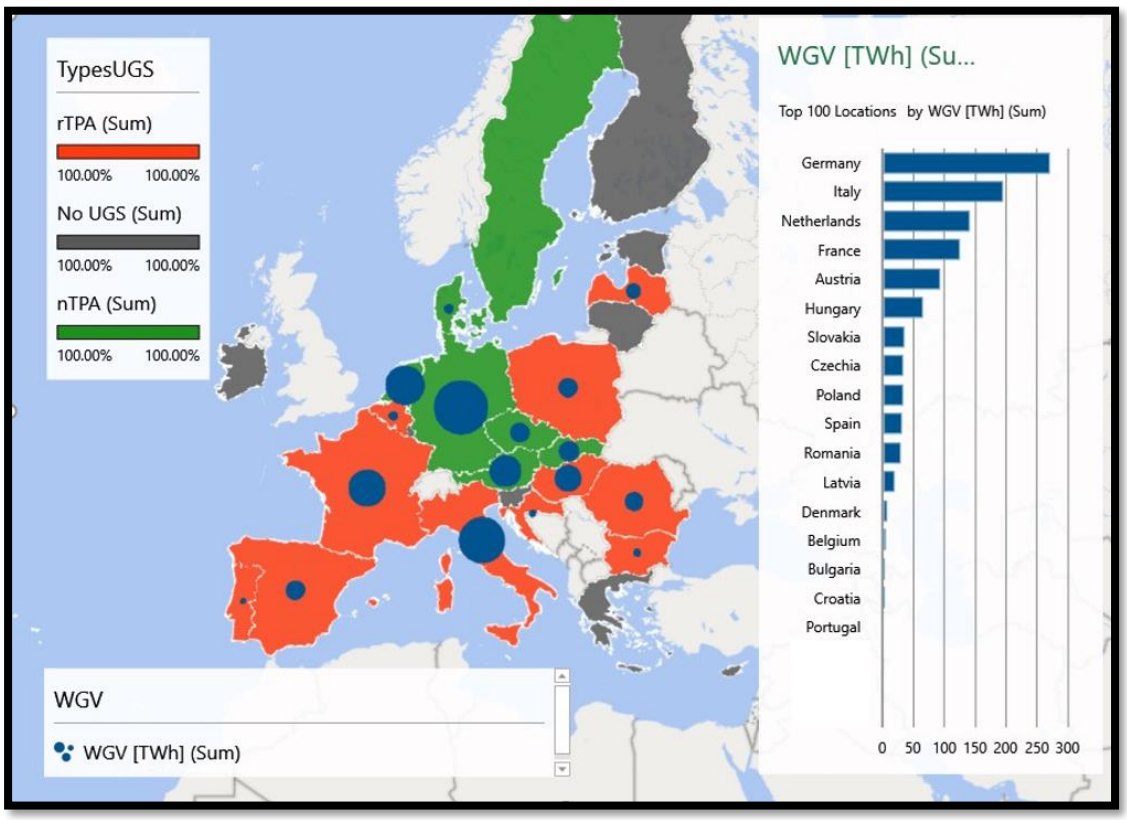


Figure 2. Regulated (r-TPA) vs. negotiated (n-TPA) third-party access storage regimes, and storage Working Gas Volume.

2.4 Validation of data from ENTSOG WSO and AGSI+ platform

Most NRAs reported no differences, or very minor differences (due to rounding, decimal places, date when data was obtained) when they were asked to validate the WGV and GIS values (1 October 2021) from ENTSOG WSO 2021/22 and AGSI+ Platform. The German NRA noted some discrepancy with the data used by BNetzA for the monitoring, and provided possible reasons and justification. The Czech NRA noted also differences which could be explained by the use of different data source, since not all UGS in Czechia were duly reported on AGSI+ Platform on 1/10/2021. NRAs replies to this question show indications of possible miscommunication, and therefore should be taken with caution.

Adequate reporting from SSOs remains key and it is recommendable to establish a more rapid process to publish final validated SSOs figures on the AGSI+ platform for storage, which would include the totality of UGS sites in the Union. The AGSI+ Platform is a voluntary initiative by SSOs in GIE. There is no full coverage of EU-27 storages, though nearly all major SSOs are reporting data[19]. According to GIE's data, the AGSI+ data cover on 23/2/2022 was close to 90% of the EU-27 storages (in terms of WGV). GIE recently informed that since early March more SSOs are willing to report to AGSI+. In the future, the storage coverage in terms of WGV may reach ~ 97%. Despite this improvement, there may be a need to move towards an obligation of all storage operators to report to AGSI+ platform.

[19] https://agsi.gie.eu/#/about https://agsi.gie.eu/#/faq

2.5 Booked Storage Volumes, anti-hoarding and obligations and entities responsible for compliance

5 NRAs have reported as of 1 October 2021 a level of booked storage volume of 100% of the WGV of the MS storage capacity; 6 report a volume equal to over 90%; 2 a volume of 80% or more; another 2 MSs 70% or more; and the remainder a storage volume of less than 70%. On 1 October 2021, the booked storage capacity in Austria, Germany, the Netherlands, Portugal and Slovakia was significantly above the actual used capacity. In Austria, Germany, Netherlands and Slovakia this can be largely explained by low filling levels of storage used or controlled by Gazprom. In Portugal, this is not atypical, as gas demand shows little seasonality for households, and gas-to-power demand is higher during the summer.

Table 6. Booked Storage Volume (BSV) in EU.

		booked storage	gas in storage	booked but not used capacity
NRA from MS	BSV [TWh]	BSV/WGV [%]	GIS/WGV [%]	anti-hoarding rules (see Q.10 for country details)
Austria	94.50	99.0%	53.6%	
Belgium	8.96	99.6%	87.2%	yes, UIOLI
Bulgaria	3.65	58.2%	70.5%	
Croatia	5.22	100.0%	90.0%	
Czechia[20]	28.34	78.7%	77.3%	No
Cyprus				
Denmark	7.55	83.1%	82.6%	
Estonia				
Finland				
France	128.50	100.0%	92.3%	yes, UIOLI
Germany[21]	265.78	96.7%	56.9%	no
Greece				
Hungary	67.70	100.0%	83.7%	yes, UIOLI
Ireland				
Italy	179.25	90.7%	85.6%	yes, UIOLI
Latvia	18.90	86.7%	79.9%	No[22]
Lithuania				
Malta				
Luxemburg				

[20] Use of data as corrected by the NRA. In case of non-use of booked capacity, the contract remains active, storage customer is obliged to pay fees – in some cases, if the capacity is significant, certain SSOs can offer the capacity as temporary working volume (as a special service)..
[21] This large difference is largely explained by the Rehden storage which is booked by Gazprom and remained almost empty during the winter 21/2022, so the capacity was booked but was not used.
[22] But about to implement UIOLI.

Netherlands*	136.36	94.8%	58.5%	No
Poland	34.63	96.8%	96.3%	
Portugal[23]	3.13	87.7%	49.9%	No
Romania	23.82	72.2%	72.6%	Yes
Slovakia[24]	38.75	92.6%	71.9%	No
Slovenia				
Spain	25.44	74.3%	73.1%	No[25]
Sweden	0.00	0.0%	66.3%	
EU-27 TOTAL	**934.07**	**81.9%**	**72.0%**	

* Data not yet available for 2022. Indicatively, ACM reported BSV on April 1, 2021. Especially for the seasonal storages in the Netherlands, this value should be quite accurate since suppliers would need to have bookings ready for filling during summer.

Several NRAs explain that there are no BSV obligations in their country. When applicable, the entities responsible for monitoring compliance are the NRAs, the transport system operator ('TSO') of the Ministry. Only Romania reports the use of obligations for the market participants (gas suppliers) to book storage capacity. However, it should be noted that MSs applying storage obligations on gas suppliers (see section 2.6) impose indirectly the booking of corresponding storage capacity.

Some NRAs have informed of the use of anti-hoarding rules to obligate the holders of booked storage to actually fill a certain percentage of the booked storage volume. In this sense, the European Gas Regulation from 2009[26] already provides principles of capacity-allocation mechanisms and congestion-management procedures concerning storage. The SSOs shall implement and publish non-discriminatory and transparent capacity-allocation mechanisms, including measures to prevent capacity-hoarding in cases of contractual congestion. In case of contractual congestion, the system operator must offer storage capacity on the primary market and storage users are entitled to re-sell their contracted capacity on the secondary market. More recently, the Commission's proposal for a regulation on gas storage of 23 March 2022 includes that MS may adopt effective instruments to set an obligation on storage capacity holders to use or release unused booked capacities[27].

The gas storage booking on 1st October 2021 in the EU-27 amounts to 81.9% meaning that there was 18.1% of available non-sold storage capacity at the beginning of the winter season 2021/2022.

[23] GIS levels in Portugal have recovered since 1st October. By 31 December 2021, storage level was at 80%. Gas consumption in Portugal is not much affected by seasonality (e.g. gas demand for power generation is higher in the summer).
[24] There is currently no obligation for SSO based on EU law to incorporate anti-hoarding rules. In Slovakia they include the possibility of the customer to sell the capacity on the secondary market, SSO has a bulletin board where the customers may offer their capacity on the secondary market. There are no rules to obligate the capacity holder to fill a certain percentage of booked storage volume.
[25] Oversubscription and buy-back (OSBB) is about to be approved for underground storages, for the capacity that is allocated through auctions.
[26] Regulation (EC) No 715/2009 on conditions for access to the natural gas transmission networks. See Article 17 - Principles of capacity-allocation mechanisms and congestion-management procedures concerning storage and LNG facilities.
[27] See in Commission's proposal, Article 1, Amendments to Regulation (EU) 2017/1938, new Article 6 (b) (1) (f).

2.6 Gas in Storage obligations and entities responsible for compliance

For guaranteeing sufficient gas in storage, 11 MS have opted to apply gas in storage obligations (GIS) (see Table 7 and Figure 3). In 3 MS, these storage obligations are on the TSO/SSO (e.g. to keep a % of annual gas supplies in storage), 4 MS apply storage obligations on holders of storage capacity (e.g. to inject a minimum level of gas according to the booked capacity) and 4 MS apply storage obligations on gas suppliers (e.g. require gas suppliers to have gas in storage according the consumers' portfolio or annual sales).

Table 7. Gas in storage obligations (GISo) in EU-27.

NRA from MS	GISo	*on TSO/SSO*	*on BSV holder*	*on gas supplier*
Austria				
Belgium	1		*1*	
Bulgaria	1	*1*		
Croatia	1		*1*	
Czechia	1			*1*
Cyprus				
Denmark				
Estonia				
Finland				
France	1		*1*	
Germany				
Greece				
Hungary	1	*1*		
Ireland				
Italy	1		*1*	
Latvia				
Lithuania				
Malta				
Luxemburg				
Netherlands				
Poland	1			*1*
Portugal	1			*1*
Romania	1	*1*		
Slovakia				
Slovenia				
Spain	1			*1*
Sweden				
EU-27 TOTAL	**11**	***3***	***4***	***4***

"1" means it is applicable

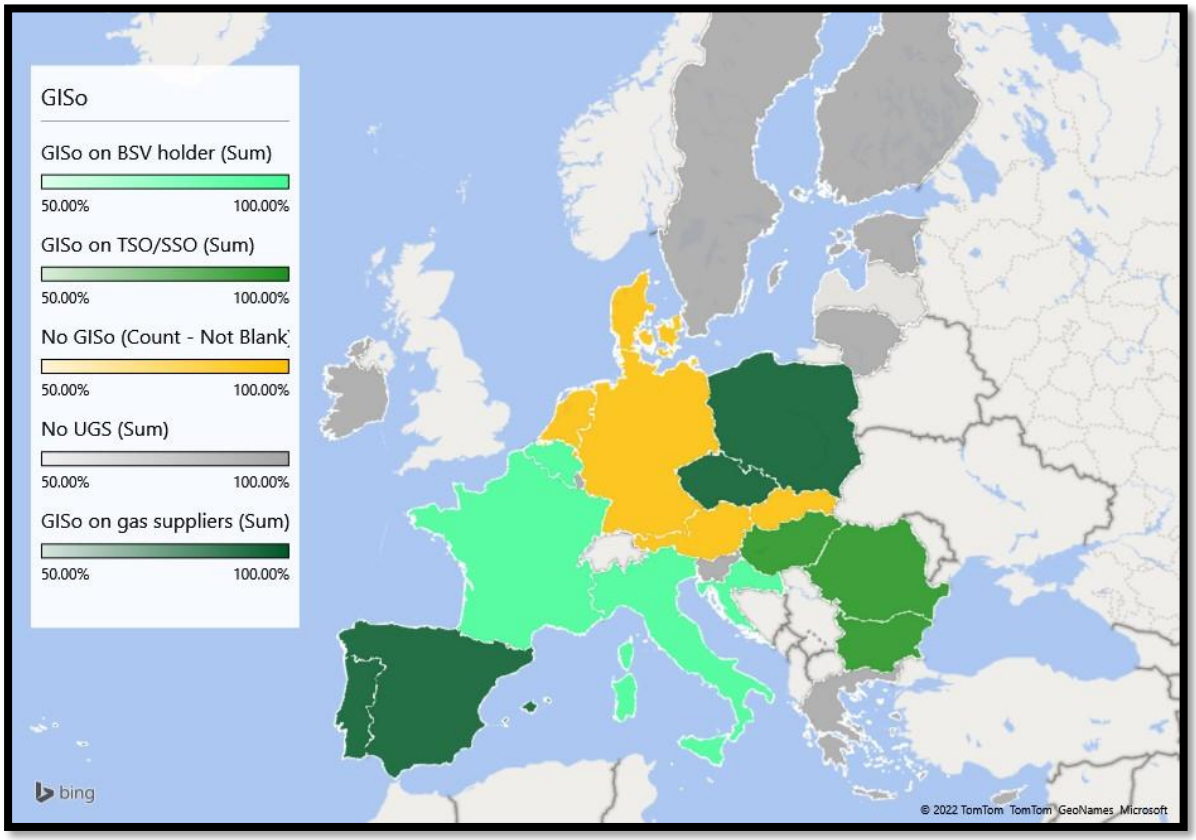


Figure 3. Gas In Storage Obligations

Four MS (Hungary, Italy, Hungary -for part of the capacity- and Sweden) have a **type of strategic storage** (e.g. a % of UGS capacity is dedicated for keeping strategic gas storage and is out of the market). For example, Italy has chosen to dedicate storage capacity for strategic purposes as a guarantee for the continuity of gas supply. However, the majority of the storage capacity in the European Union is currently freely available to market participants without mandatory storage requirements from a specific gas in storage policy.

In 6 MS (Austria, Germany, Latvia, Netherlands, Slovakia, and Sweden) there are no storage obligations at all. In Denmark, the TSO can use gas storage in case of emergency in case of security of gas supply crisis[28].

Where applicable, obligations are related **to obligations of gas suppliers** to inject gas in storage sites/system and to respect minimum levels of gas in storage. These obligations may be also related to technical requirements for optimal functioning of storage sites, anti-hoarding measures and other security of supply considerations. A summary of the main GIS obligations per MS is provided below:

- Belgium. GIS must be at least 90% of BSV on 1 November (as an anti-hoarding measure) and at least 30% of BSV on 15 February. These rules are applicable to all storage users in Belgium.

[28] See Annex, Q8 for additional information.

- Bulgaria. GIS should ensure gas security of supply requirements.
- Czechia. Gas suppliers to protected customers in Czechia are required by legislation related to security of supply requirements to keep a 30% of gas supplies for protected customers in storage in Czechia or EU from January to March and October to December. There are no obligations on holders of booked storage capacity.
- France. Suppliers that have booked storage capacity shall actually store gas at a minimum level of 85% of their booked capacity by November 1st each year.
- Hungary. Security of supply requirements: mandatory storage of natural gas for the universal service costumer (USC)[29], with pro-competition requirements (anti-hoarding capacity measures).
- Italy. GIS obligations on holders of booked storage volumes mainly as pro-competitive and beneficial measure for SoS. Certain limitations to the daily gas withdrawals to avoid storage being emptied too soon, as storage withdrawal capacity is directly linked to the level of gas stored. Maximum volumes that can be withdrawn from storage are to be compliant with a Ministerial decree and published on storage operator's website.
- Poland. Obligation to maintain mandatory stocks are based on security of supply requirements up to the level of the mandatory gas volumes described in the administrative decisions.
- Portugal. Obligations for strategic reserves is defined by law, related to security of supply requirements. Until October 2021, security reserves were mandatory and equal to 30 days of (average daily) consumption for protected consumers and also for power stations with non-interruptible gas consumption. In January 2022, the reserves' obligations legal framework was increased to 45 days of average daily consumption of protected consumers and 16 days of rated power consumption of electric power stations with non-interruptible gas consumption. It also includes mandatory "additional reserves", on top of security reserves between October and March.
- Romania. Suppliers' obligation connected to the security of supply requirements for the end users.
- Spain. Storage users (gas suppliers) have the obligation to store 20 days of annual firm sales to all kind of final consumers (strategic reserves), as well as the possibility to store 60 days of household consumption and 10 days of other firm sales (operative reserves).

As regards the **responsibility for monitoring the compliance with GIS obligations**, where applicable, there are different models. In all cases there is **regular monitoring from the SSOs**. In the case of all regulated storages and for most negotiated storages, **SSO report to public authorities (Ministries, NRAs) and in some instances also to oil and gas national stockpiling** associations (Hungary and Spain). Most NRAs from MSs with negotiated storages (Austria, Denmark, Germany, Latvia, Netherlands and Sweden) have not identified actors responsible for compliance, as GIS obligations are not applicable. However, NRAs with negotiated storages may also receive regular information on storage filling levels and contracts (e.g. Austria, Germany confirmed, and possibly others).

NRAs report four type of measures to address non-compliance with GIS obligations: use-it-or-loose-it (UIOLI) regime applicable where booked but not used storage capacity is offered again on the market (e.g. Belgium, Hungary, Italy), oversubscription and buy-back (OSBB)

[29] Includes regulated energy and public utility prices for household residential customers and customers under 20m3/h consumption

mechanism (Spain[30]), fines (Czechia, France, Hungary, Poland, Portugal, Spain) and a possibility to suspend or revoke licenses and contracts for use of storage (e.g. Croatia, Hungary).

2.7 Public information

NRAs report (see Q11) availability of public information on legal, regulatory and contractual documents related to storage for MS with regulated storage. With a few exceptions, this is information is not available in English. This level of publicity is generally lower for MS with negotiated storage (e.g. Austria, Germany, Latvia, Netherlands and Sweden).

2.8 Storage tariff regime

Table 8 shows that **different tariff and access to storage regimes coexist across Member States**. **11 Member States** (Belgium, Bulgaria, Croatia, France, Hungary, Italy, Latvia, Poland, Portugal, Romania and Spain) **have regulated access to storage, while the remaining 7** (Austria, Czechia, Denmark, Germany, Netherlands, Slovakia, Sweden) **opted for a negotiated access regime**. NRAs report that negotiated access takes place on the basis of reasonable and non-discriminatory technical and economic terms, with reference tariffs published in most cases. As regards **the way tariff values are set**, it is frequent that the value of regulated tariffs is the result of **an auction** for capacity storage (e.g. Belgium, France, Hungary, Italy, Latvia, Poland, Portugal, Spain), being auctions also widely used to set the values of negotiated tariffs. NRAs do not report fixed negotiated tariffs.

Table 8. EU-27 storage tariff regimes.

NRA from MS	regulated	regulated +auction	negotiated +auction
Austria			1
Belgium		1	
Bulgaria	1		
Croatia	1		
Czechia			1
Cyprus			
Denmark			1
Estonia			
Finland			
France		1	
Germany			1
Greece			
Hungary		1	
Ireland			
Italy		1	
Latvia		1	
Lithuania			
Malta			

[30] OSBB is on the point of being approved for underground storages, for the capacity that is assigned through auctions.

Luxemburg			
Netherlands*			1
Poland		1	
Portugal		1	
Romania	1		
Slovakia			1
Slovenia			
Spain[31]		1	
Sweden			1
EU-27 TOTAL	**3**	**8**	**7**

2.9 Capacity products offered

NRAs were asked to report **the capacity products offered by SSOs**, being possible to select multiple choices from the following options (see definitions in Annex - Q14): 1. Standard bundled products, 2. Unbundled products, 3. Storage products delivered at hub, 4. Pooled storage, 5. Virtual products, 6. Cross-border products. Tables 9 presents the storage products offered in each MS.

Table 9. Storage capacity products in EU-27.

NRA from MS	standard bundled products	unbundled products	storage products delivered at hub	pooled storage	virtual products	cross-border products
Austria	1	1		1	1	1
Belgium	1	1				
Bulgaria	1	1			1	
Croatia	1	1				
Czechia	1	1		1	1	
Cyprus						
Denmark	1		1	1	1	
Estonia						
Finland						
France	1					
Germany	1	1	1	1	1	1
Greece						
Hungary	1	1	1	1	1	1
Ireland						
Italy	1	1				
Latvia	1					
Lithuania						
Malta						

[31] Spain: The storage tariff regime in place is the regulated tariff for the capacity allocated directly and the price resulting in the regulated auction mechanism, whose reference price is the regulated tariff.

Luxemburg						
Netherlands	1		1		1	
Poland	1	1			1	
Portugal	1	1				
Romania	1					
Slovakia	1	1	1	1		1
Slovenia						
Spain	1	1			1	
Sweden		1				
EU-27 TOTAL	**17**	**12**	**5**	**6**	**9**	**4**

The availability of storage capacity products ranges from a single standard bundled product to up to six different products. **All but one NRA reported that the storage system operators (SSO) offer standard bundled products**, while 12 NRAs responded that SSOs were offering unbundled products. 9 NRAs selected virtual products, 5 inform of the existence of storage products delivered at the hub (Denmark, Germany, Hungary, Netherlands, Slovakia). Pooled storages are used also in 6 MSs (Austria, Czechia, Denmark, Germany, Hungary, Slovakia) and cross-border products are apparently only available in Austria, Germany, Hungary and Slovakia. NRAs report that 10 MS offer three or more types of capacity products, and all 6 type of capacity products are available in Germany and Hungary.

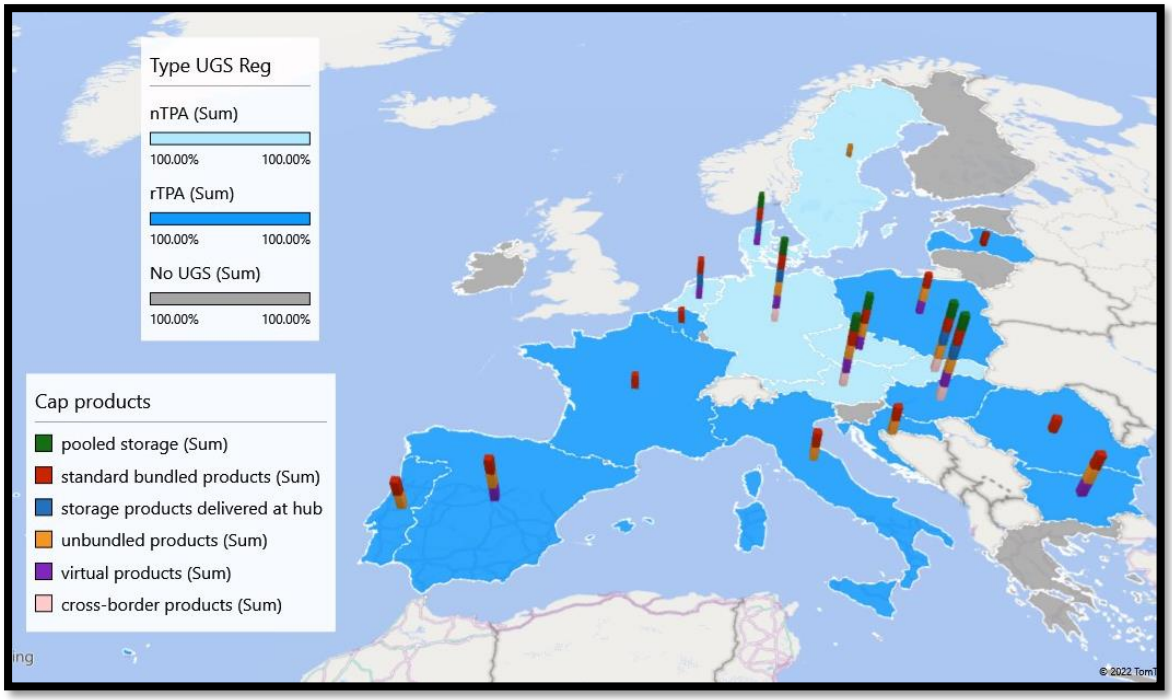


Figure 4. Availability of capacity products and type of storage regulation, as reported by NRAs

2.10 Ongoing national discussions on storage regulation and filling levels.

Gas in storage levels are subject to regular monitoring by the SSOs, network operators and most NRAs. At the time of collecting this information (January 2022), the majority of NRAs despite noting that the vigilance over gas storage levels has increased this year, did not report that current Gas In Storage (GIS) levels was a big concern. At that moment, **only ACM**

(for the Netherlands) reported concerns focussed on GIS for high calorific value gas (H-gas) storages and ongoing political discussions around plans for setting minimum storage obligations, and Ei (for Sweden) made reference to an ongoing discussion with gas suppliers to commercially fill the storage in Sweden and the GIS levels in neighbouring Denmark. In Bulgaria and Croatia, plans for expanding storage capacities are under discussion.

NRAs from Member States which opted for a regulated regime for storage (e.g. Belgium, France, Italy, Poland and Spain) have a positive assessment of their national systems and note an adequate storage filling level at the start of current winter season. In Portugal, the filling levels were low in October (50%) but they recovered by December 2021 (80%). In Portugal, it is not atypical that storage levels are lower in October as gas demand for power generation is higher during the summer. NRAs from MS with negotiated storage do not deem that regulatory intervention would be necessary and, in some cases (Austria, Slovakia) note that the available storage capacity is used also by gas traders and gas suppliers of adjacent Member States, not necessarily correlating low storage levels in their territory with a serious concern for national gas consumers.

As mentioned, most of the information provided by NRAs was collected until January 2022, before the start of the armed conflict in Ukraine. Since then, national and EU initiatives to revise and strengthen storage regulation have quickly accelerated. Recently, Austria and Germany have announced plans to consider establishing storage obligations. **In Austria**, stricter requirements for fulfilling the security of supply standard for protected customers are under development, based on the use of storage contracts. In addition, other incentives for filling the storages are analysed to achieve a sufficient storage filling level at the beginning of the next winter 2022/23. In **Germany**, in light of the situation in the Ukraine, the dependence of Russian gas combined with a relatively low storage filling levels during the winter 2021/22, a strictly market-based approach to storages is not perceived any more as the best way to cope with the upcoming challenges. Therefore, the German Ministry for Economic Affairs and Climate Protection recently presented on 28 February 2022 a proposal regulating the use of storage facilities. The key points are a three-stage model combining Long-Term Options (LTOs), minimum storage filling levels and a Use-It-Or-Lose-It (UIOLI) principle for use of storage capacity, in case the sufficient level of gas in storage is not reached. The aim is that the new storage regulations will come into force as early as 1 May, in time for the summer period for filling storage facilities. The details are still under discussion.

Table 10. Are GIS levels a concern in your MS? Source: NRAs

NRAs from MS	*GIS levels currently a concern?*
Austria	Discussion on storage obligations
Belgium	no
Bulgaria	UGS expansion
Croatia	UGS expansion
Czechia	no
Denmark	no
France	no
Germany	Under debate, draft legislation
Hungary	no
Italy	no
Latvia	no
Netherlands	Discussion on storage obligations

Poland	no
Portugal	no
Romania	no
Slovakia	no
Spain	no
Sweden	no

ANNEX: QUESTIONNAIRE RESPONSES

Q1: Which type(s) of storage regulation is applicable in your country?

Please describe the main considerations you deem relevant. In case that different types are applied per distinct SSOs please inform.

Choose from the following options:

1.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;

2.Revenue reconciliation: storage operators receive additional revenues if the difference between market revenues and regulated income is negative;

3.Storage obligations: gas suppliers are required by regulation to keep a percentage of annual gas suppliers in storage, guaranteeing more steady revenue stream for operators as use of storage services is imposed;

4.Strategic storage: storage operators dedicate a certain share of storage to strategic storage, which is not commercially available and which costs are socialised among market participants;

5.Others: select only if the storage model clearly does not fit into any of the options above, or if it is a combination of the above (explain)

NRA from MS	*1.Market-based approach*	*2.Revenue reconciliation*	*3.Storage obligations*	*4.Strategic storage*	*5.Others*	*Total*
Austria	X					1
Belgium	X					1
Bulgaria	X		x			2
Croatia		x				1
Czechia	X		x			2
Denmark	X					1
France		x				1
Germany	X					1
Hungary	X		x	x		3
Italy		x		x		2
Latvia	X					1
Netherlands	X					1
Poland			x		x	2
Portugal		x	x	x		3
Romania			x			1

Slovakia	X					1
Spain	X		x			2
Sweden	X			x		2
18	**12**	**4**	**7**	**4**	**1**	
	67%	**22%**	**39%**	**22%**	**6%**	

Summary: Most respondents (67%, 12 MSs) indicate that storage regulation follows a market based-approach, followed by storage obligations (39%, 7 MSs) and revenue reconciliation (22%, 4 MSs). Only 4 MS (Italy, Portugal, Hungary for a part of the capacity, and Sweden) have strategic storage. Nearly half of the respondents chose two options (e.g. market-based approach and strategic storages) as applicable in their Member States. However, it is not always straightforward to categorise the type of storage regulation in EU MS. Therefore, the responses on the type of storage should be read in conjunction with the description of the storage regulation (see below).

Q2: Brief description of storage regulation in your country

In case that different regimes are applied per distinct SSOs please inform.

NRA from MS	*description of storage regulation*
Austria	Transparent and non-discriminatory negotiated access for all SSOs
Belgium	There is one UGS operated by the SSO Fluxys Belgium. Regulated TPA and regulated tariffs. There is a scheme to use a regulated auction mechanism to allocate storage capacity in case that not all capacity can be sold at regulated tariffs
Bulgaria	There is one UGS operated by the TSO Bulgartransgaz EAD. Regulated TPA and regulated tariffs. The method of price regulation for access and storage of natural gas in the storage facilities is "rate of return on capital" (costs plus). According to Art. 3, para. 2, item 1 of the Ordinance 2 of 2013 on regulation of natural gas prices the NRA, after a regulatory review, approves allowed revenues and tariffs for the regulatory period, not less than one year. Next regulatory review is carried out by decision of the NRA or at the request of the TSO.
Croatia	Method of incentive regulation, which entails establishing a maximum allowed revenue for the gas storage system operator. The allocation of Standard Bundled Unit (SBU) is carried out through the auction procedure for a maximum period of 5 years and separately for each individual storage year. There is one UGS in Croatia operated by the SSO Podzemno skladište plina (PSP) Ltd.
Czechia	Transparent and non-discriminatory negotiated access for all SSOs with an auction mechanism in place. The regulation describes only the basic rules and terms for gas storage and auctions (in Market Rules). Details are described in Storage Operator Code (Code of the gas storage operation) and Business conditions.

Denmark	Gas storage is owned by Energinet but it is unbundled. It is regulated by the Danish Gas Supply Act (and Rules for Gas Storage) and monitored by the Danish Utility Regulator and the Danish Energy Agency. Pricing is market-based via n-TPA, and the storage operator publishes indicative prices and standard contracts (between customer and storage operator) each storage year. The storage operator, market participants, and TSO have a common obligation for security of supply.
France	Since the entry into the regulation of storage operators in 2018, the French storage framework consists of: - the setting by CRE of an allowed revenue for each of the 3 SSOs; - the auctioning of storage capacity by SSOs, according to the terms and conditions defined by CRE; - the compensation of the (positive or negative) difference between the revenues of SSOs (mostly generated by the auctioning of capacity) and the allowed revenues set by CRE; the compensation (positive or negative) is collected via TSOs' network tariffs with a dedicated term, and transferred to SSOs.
Germany	Negotiated access on reasonable and non-discriminatory technical and economic terms, no regulated tariffs.
Hungary	There are two SSOs in Hungary: - Hungarian Gas Storage Ltd that operates, maintains and continuously develops four underground gas storage facilities (commercial storages), with a total gas storage capacity of 4.43 billion m3 and a total daily withdrawal capacity of 49.8 million m3. - HEXUM Natural Gas Company Limited by Shares operates commercial and strategic storage, with a total gas storage capacity of 1.9 billion m3. There is regulated TPA, regulated tariff and transparent and non-discriminatory negotiated access for all commercial storages. In addition to commercial storages, there is a dedicated, independent strategic storage. In addition to MEKH, the strategic storage is supervised by the Hungarian Hydrocarbon Stockpiling Association (HUSA), whose task is to establish and maintain the safety stockpile and to create the necessary conditions for this. The Association is responsible for the creation and maintenance of the level of strategic stocks laid down by two acts as well as providing for the necessary conditions. Association is a special and unique legal entity established by law. HUSA fulfils its responsibilities as an autonomous body under state supervision in compliance with industry self-governance regulated and supported by prominent and detailed rules. There is no independent strategic storage SSO, part of the HEXUM storage is the strategic storage capacities.
Italy	In Italy, there are currently 3 storage operators: Stogit (a subsidiary of SNAM), Edison Stoccaggio and Ital Gas Storage. They operate 13 concessions overall, with an overall storage capacity of around 18 bcm and a maximum withdrawal capacity of about 300 Mcm/day. Storage is a regulated activity (regulated TPA and regulated tariffs), operated under a legal unbundling regime. All storage services are regulated and are allocated at market conditions (series of auctions with reserve price decreasing - even below the tariff level - approaching the delivery period). SSOs are required to make available all their capacity to the system, and to manage the whole storage capacity in a coordinated and integrated manner to ensure better optimisation in its utilisation and the safety of the national gas system.

Latvia	There is one UGS in LV operated by the SSO Conexus Baltic Grid. Regulated TPA and regulated tariffs combined with premium from storage capacity booking auctions. Capacity of the UGS is booked in an auction procedure. Storage user is obliged to pay the SSO for the allocated capacity product in accordance with storage service tariffs and the premium determined in the storage capacity auction procedure.
Netherlands	Transparent and non-discriminatory negotiated access for all SSOs.
Poland	Regulated access to storage services. Tariffs are calculated by SSO and approved by the President of ERO. Storage code after public consultation is approved by SSO. According to the Article 24 (1) of the Polish Act on reserves of crude oil, petroleum products and natural gas and the rules of conduct in emergency situations of national fuel security and disruption in the oil market of 16 February 2007 there are two categories of entities obliged to maintain mandatory stocks of natural gas: 1) undertakings engaged in the business of trading natural gas with foreign countries; and 2) end users importing natural gas from abroad.
Portugal	There is one UGS operated by the SSO "REN Armazenagem." Revenues and tariffs for UGS operator are regulated and determined by the NRA. Capacity is offered through standard products, similar to the transmission capacity products. Capacity is offered to the next year although it is possible to offer capacity into the next 5 years. Short term products are also used. Allocation rules follow the CAM NC ones. Investment plans for new storage capacity is included in the ten-year development plans and subject to approval by the ministry (who grants the concession for storage).
Romania	Regulated TPA based on objective, transparent and non-discriminatory criteria, according to the energy law and ANRE regulations.
Slovakia	there are 2 storages (SSO) Nafta, a.s. and Pozagas, a.s., depleted gas fields, West part of Slovakia close to Austria and Czechia, access is regulated, on a transparent and non-discriminatory negotiated access (TPA). No tariff regulation applies at this moment. Both companies act as interconnected storages, under similar conditions. Nafta/Pozagas provide innovation and prospection of new solutions such as H2 storage, sun storage, project HyUsPre.
Spain	In Spain, there are 2 SSO and 4 basic UGS facilities. The Technical System Manager (Enagás GTS) coordinates their operation as a single one (a virtual underground storage). Storages are regulated infrastructures (full r-TPA) whose access mechanisms are defined, on the one hand, by the Ministry for Ecological Transition and Demographic Challenge for the strategic storage (direct allocation), and on the other hand, by the CNMC for the remaining capacity (market-based allocation). The market-based allocation procedure consists of ascending-clock auctions of standard products (annual, quarterly, monthly, daily and intraday products).
Sweden	There is one UGS in SE operated by Swedegas. Regulated TPA and regulated revenue cap.

Summary: NRAs have provided a brief description of storage regulation in their MS, providing insights into key regulatory aspects, such as use of auction mechanism to allocate capacity or type of regulation to set allowed revenues, as well as on the number of storage sites and operators. The availability of number of storage sites and operators differ per MS: some countries only have 1 UGS, others several operated by the same SSO, while in others (e.g.

Italy with 13 UGS operated by 3 SSOs) numerous UGS sites are operated by different SSO. Overall 11 NRAs described their storage regulation characterised as regulated TPA and regulated tariffs. 7 NRAs defined their storage regulation as transparent and non-discriminatory with negotiated access for all SSOs. In one 1 MS (Hungary), there is transparent and non-discriminatory negotiated access for all commercial storages, and in addition to commercial storages there is also independent strategic storage.

Q3: Validate the WGV and GIS values (1 October 2021) from ENTSOG WSO '21/'22 and from AGSI Platform

(See table at the end of this Report). In case there are differences in data, is there an explanation? If your NRA is not able to validate the data, please inform.

NRA from MS	*validate the WGV and GIS values (1 October 2021*
Austria	No differences compared to ENTSOG's Outlook/AGSI platform.
Belgium	No differences compared to ENTSOG's Outlook/AGSI platform.
Bulgaria	WGV on 1/10/2021 = 5,81 TWh (2 decimal places) GIS on 1/10/2021 = 4,09 TWh (2 decimal places)
Croatia	WGV on 1/10/2021 = 5,22 TWh and GIS on 1/10/2021 = 4,73 TWh. No differences compared to ENTSOG's Outlook/AGSI platform.
Czechia	WGV on 1/10/2021 = 36,07 TWh GIS on 1/10/2021 = 27,89 TWh Differences compared to ENTSOG's Outlook/AGSI platform. One of possible explanations can be the difference in source of data, since not all Czechia UGS are duly reported on AGSI+ Platform. incl. MND Gas Storage / UGS Uhřice and Moravia Gas Storage / UGS Dambořice not reporting data to AGSI+ excl. SPP Storage / UGS Dolni Bojanovice because of its connection only to the Slovak network AGSI+ data: WGW 35,99 TWh GIS 30,6506 TWh not valid
Denmark	WGV on 1/10/2021 = 9,08 TWh (2 decimal places) GIS on 1/10/2021 = 7,50 TWh (2 decimal places) Explanation of any differences in data: Difference in GIS between ENTSOG and AGSI. Data from AGSI (7,50) corresponds with own data (from Energinet Data Service). Differences might due to the date data has been obtained.
France	WGV on 01/10/2021 = 128,46 TWh and GIS on 01/10/2021 = 118,56 TWh, which corresponds to a 92% filling level. The value used by ENTSOG in its WSO analysis (115,12 TWh) appears to be the value for the day 30/09/2021 and not for the day 01/10/2021.
Germany	Data from BNetzA Monitoring 2021: 274,72 TWh - incl. Haidach/Astora and 7Fields/Uniper which is not included in AGSI because storages facilities are located in Austria, - excl. Eneco Epe, Nuon Epe because of their connection only to the Dutch grid AGSI platform: 222,43 TWh - not all SSOs deliver data, so the WGV is lower - Discrepancy between AGSI+ data as of December and ENTSOG WSO: the data of Etzel Kavernen Betriebsspeicher (EKB) was added to AGSI+ at the beginning of November (data was added back until 2016)

Hungary	WGV on 1/10/2021 = 67,70 TWh (2 decimal places) GIS on 1/10/2021 = 56,65 TWh (2 decimal places) Explanation of any differences in data: the difference is due to a rounding error
Italy	Irrelevant differences compared to ENTSOG's Outlook/AGSI platform, probably due to energy conversion with different GCVs. Conclusion: No differences
Latvia	WGV on 1/10/2021 = 21.80 TWh. No differences compared to ENTSOG's Outlook/AGSI platform. GIS on 1/10/2021 = 17.41 TWh. The difference between ENTSOG's Outlook and AGSI is due to the typo in ENTSOG's Outlook
Netherlands	Unable to validate, because AGSI is the source we use for our monitoring.
Poland	WGV on 1/10/2021 = 35,79 TWh and GIS on 1/10/2021 = 34,46 TWh. No differences compared to ENTSOG's Outlook/AGSI Platform.
Portugal	WGV on 1/10/2021 = 3,57 TWh and GIS on 1/10/2021 = 1,78 TWh No differences compared to ENTSOG's Outlook/AGSI platform
Romania	No differences compared to ENTSOG's Outlook/AGSI platform.
Slovakia	Slovakia=>aggregated data for both storages: WGV on 1/10/2021 = 38,74 TWh GIS on 1/10/2021 = 27,86 TWh Which present fulness at 72% as of October 1st/2021
Spain	WGV on 1/10/2021 = 34,25 TWh GIS on 1/10/2021 = 25,02 TWh No differences compared to ENTSOG's Outlook/AGSI platform.
Sweden	WGV on 1/10/2021 = 0,083 TWh (2 decimal places) GIS on 1/10/2021 = 0,002 TWh (2 decimal places) Explanation of any differences in data: The differences compared to ENTSOG's Outlook/AGSI platform is unknown

Summary: At least 12 NRAs reported no differences, or very minor differences (due to rounding, decimal places, due to data when data was obtained) when were asked to validate the WGV and GIS values (1 October 2021) from ENTSOG WSO 2021/22 and from AGSI+ Platform. The German NRA noted some discrepancy from the data used by BNetzA for the monitoring, and provided possible reasons and justification. NRAs replies to this question show possible miscommunication, and therefore should be taken with caution. However, overall most of the answers should reflect on "no relevant differences when comparing the data".

Q4: What is the level of booked storage volume (BSV) by market participants

expressed in TWh as well as in % of the WGV on 1st October 2021?

NRA from MS	*level of booked storage volume (BSV)*
Austria	BSV on 1/10/2021 = 94,5 TWh (2 decimal places) (BSV/WGV = 99 %)
Belgium	BSV on 1/10/2021 = 8,96 TWh which corresponds to 100% booking taking into account the committed injection profiles
Bulgaria	BSV on 1/10/2021 = 3,65 TWh (2 decimal places) (BSV/WGV = 63%)
Croatia	BSV on 1/10/2021 = 5,22 TWh which corresponds to 100% booking. The SSO sold all its available SBUs.

Czechia	28,34 TWh which corresponds to 78,57% booking.
Denmark	There is a difference in WGV between AGSI and Energinet Data Service AGSI – WGV: 9,08 TWh EDS – WGV: 8,08 TWh BSV on 1/10/2021 = 7,55 TWh (2 decimal places) AGSI: (BSV/WGV = 83%). EDS: (BSV/WGV = 93%).
France	BSV on 01/10/2021 = 128,46 TWh, which is 100% booking.
Germany	Data by 01.04.2021: 8,94 TWh unbocked for 1.10.2021 so (274,72-8,94)TWh = 265,78 TWh are booked BSV on 1/10/2021 = 265,78 TWh BSV/WGV = 265,78 /274,72 = 96,75% booking level
Hungary	BSV on 1/10/2021 = 67,70 TWh (2 decimal places) (BSV/WGV = 100%)
Italy	BSV on 1/10/2021 = 179,25 TWh (2 decimal places) (BSV/WGV = 93%)
Latvia	BSV on 1/10/2021* = 18.90 TWh (BSV/WGV = 86.7%) *data for October 15, as according to Regulations Regarding the Use of the Inčukalns Underground Gas Storage Facility the natural gas injection season of the storage cycle shall end on 14 October of the relevant year.
Netherlands	We don't have this information for the winter 2021/2022 yet, this will become available in April/May.
Poland	BSV on 1/10/2021 = 34,63 TWh (BSV/WGV = 97%)
Portugal	BSV on 1/10/2021 = 3,13 TWh (2 decimal places) (BSV/WGV = 88 %)
Romania	72,19% (from which: 2% TSO and 98% the market participants)
Slovakia	Slovakia=> BSV on 1/10/2021 = 38,7 TWh; which corresponds to 100% booking taking into account the committed injection profiles
Spain	BSV on 1/10/2021 = 25,44 TWh (BSV/WGV = 74%)
Sweden	BSV on 1/10/2021 = 0,00 TWh (2 decimal places) (BSV/WGV = 0%)

Summary: Noting that there might be possible misunderstanding and incompleteness from NRA answers to this questions, 28% of the MSs (5 MSs) have reported as of 1 October 2021, a level of booked storage volume of 100% of the WGV of all storage in that MS; 33% (6Ms) report a volume equal of over 90%; 11% (2 MSs) a volume of 80% or more; another 11% 70% or more; 1 MS a volume of over 60%. The figures are generally consistent with data available from ENTSOG's WSO.

Q5: Applicable BSV obligations:

Are there obligations for the market participants (gas suppliers) to book storage capacity in your country? If yes, can these obligations also be fulfilled by booking storage capacity abroad?

	BSV obligations (Q5, provisional)		
NRA from MS	**Y**	**N**	**Comment**
Austria		x	There are no obligations on the market (suppliers) to book storage capacity.

Belgium		x	There are no obligations on the market (suppliers) to book storage capacity.
Bulgaria		x	Natural gas supply companies that supply natural gas to customers with uneven consumption are obliged to provide quantities of natural gas to compensate for the uneven consumption of their customers. These companies are obliged to store at the beginning of the winter season / production period / in UGS quantities of natural gas to compensate for seasonal irregularities, which should be within 10% to 20% of annual supply orders of natural gas for their uneven consumers.
Croatia		x	There are no obligations for the market participants (suppliers) to book storage capacity.
Czechia		x	There are no obligations on the market (suppliers) to book storage capacity.
Denmark		x	No obligations.
France		x	There is no obligation to book storage capacity for suppliers. However, each year, a decree sets the level of stocks that must be reached on November 1st to secure winter supplies ("safety net" system). If, at the end of the auctions, the capacities acquired by all the suppliers prove to be insufficient to reach this level, the storage operators shall buy and store up to 20 TWh of gas. If this remains insufficient, suppliers may be obliged to subscribe to additional storage capacities. To date, the activation of this mechanism has never been required.
Germany		x	There are no obligations on the market (suppliers) to book storage capacity.
Hungary		x	The universal service provider must have, directly or indirectly, on 1 October each year, a natural gas supply located in a domestic natural gas storage facility to the extent determined by the Authority, taking into account the highest winter consumption of the service area during the last hundred and twenty months. MEKH shall publish the amount of natural gas stocks to be stored on its website by 1 March each year. The USP must present to the NRA: (a) until 31 March, reserved storage and transmission capacity, (b) by 1 October, the amount of mobile stocks in storage.
Italy		x	There are no obligations on the market (suppliers) to book storage capacity. Ex. Austria=> there are no obligations on the market (suppliers) to book storage capacity Ex. Belgium=> there are no obligations on the market (suppliers) to book storage capacity
Latvia		x	There are no obligations on the market (suppliers) to book storage capacity.
Netherlands		x	no obligations
Poland		x	Existing obligation to maintain the mandatory stocks could be fulfilled also by booking storage capacity abroad. Article 24(2-3) read in

			conjunction with Article 24a(1) of the Act on reserves of crude oil, petroleum products and natural gas and the rules of conduct in emergency situations of national fuel security and disruption in the oil market of 16 February 2007 (Journal of Laws of 2021, item 2249, consolidated act) hereinafter referred to as the 'Act on Reserves' requires the mandatory stocks of natural gas to be maintained on the territory of Republic of Poland or abroad: on the territory of another member state of the European Union or the European Free Trade Association (EFTA) – a party to the agreement on the European Economic Area in storage installations which technical parameters allow the total volume of the mandatory stocks to be delivered to the national gas system within no more than 40 days.
Portugal		x	Users are obligated to keep strategic gas reserves in proportion to their non-interruptible customers. These reserves have to be stored either in the underground storage or in the LNG terminal storage. The most relevant players use the terminal therefore their LNG is accounted for gas reserves obligation. Anyway they also book underground storage for that effect. Until Oct 2021, security reserves were mandatory and equal to 30 days of (average daily) consumption for protected consumers and also for power stations with non-interruptible gas consumption. In January 2022, security reserves' legal regime was changed and the reserves' obligations is now 45 days of average daily consumption of protected consumers and 16 days of rated power consumption of electric power stations with non-interruptible gas consumption. The new legal framework also includes mandatory "additional reserves", on top of security reserves between October and March
Romania	x		There are obligations for TSO and suppliers to book storage capacity. The law does not forbid the storage abroad.
Slovakia		x	Slovakia=> there are no obligations on the market (suppliers) to book storage capacity, only business / contractual conditions applied. A gas supplier has the right to book a capacity to maintain a safe and reliable gas supply
Spain		x	There are no obligations to book capacity but to store gas (please, see answer to Q1), and you can't store gas if you don't have booked capacity before.
Sweden		x	There are no obligations on the market (suppliers) to book storage capacity.
18	**1**	**17**	
	6%	**94%**	

Summary: Overall 94% of the MSs (17) answered that there are no obligations for the market participants (gas suppliers) to book storage capacity in their country, and only 1 MS replied that there is indeed an obligation to book storage capacity. Answers to this question should be interpreted with caution, as MSs applying storage obligations on gas suppliers (see section 2.6) impose indirectly the booking of corresponding UGS capacity.

Q6: Who (e.g. SSO, NRA, etc.) is responsible for monitoring compliance with BSV obligations?

NRA reply	Number	%
Ministry	**1**	**6%**
Bulgaria		
n.a.	**13**	**72%**
Austria		
Belgium		
Croatia		
Czechia		
Denmark		
France		
Germany		
Italy		
Latvia		
Netherlands		
Slovakia		
Spain		
Sweden		
NRA	**3**	**17%**
Hungary		
Poland		
Romania		
TSO	**1**	**6%**
Portugal		
Grand Total	**18**	**100%**

NRA from MS	*Who (e.g. SSO, NRA, etc.) is responsible for monitoring compliance with BSV*
Austria	Not applicable, no BSV obligations in Austria.
Belgium	Not applicable, no BSV obligations in Belgium.
Bulgaria	Bulgarian Ministry of energy is a competent authority under Regulation (EU) 2017/1938 of the European Parliament and of the Council of 25 October 2017 concerning measures to safeguard the security of gas supply and repealing Regulation (EU) No 994/2010.
Croatia	Not applicable, no BSV obligations in Croatia.
Czechia	Not applicable, no BSV obligations.
Denmark	Not applicable.
France	There is no booking obligation in France.
Germany	Not applicable, no BSV obligations in Germany.
Hungary	Magyar Energetikai és Közmű-szabályozási Hivatal (MEKH)
Italy	Not applicable, no BSV obligations in Italy.
Latvia	Not applicable, no BSV obligations in Latvia.
Netherlands	Not applicable, no BSV obligations in the Netherlands.

Poland	The President of ERO is responsible for monitoring the fulfilment of the obligation to maintain the mandatory stocks, including compliance with BSV obligations.
Portugal	The System Manager (TSO) is responsible for monitoring gas reserves obligations.
Romania	ANRE
Slovakia	Slovakia=> BVS – no requirement only monitoring of status of storage development – this monitoring serve as a background for evolution of each reservoir. Together with GIS the SSO sent a yearly overview and report to Mining Authority and Ministry of economy, who is responsible for monitoring gas SoS
Spain	Not applicable.
Sweden	Not applicable, no BSV obligations in Sweden.

Summary: Majority of the replies (72%, 13 MSs) explain that there are no BSV obligations in their country. 3 respondents replied that NRAs are responsible for monitoring compliance of BSV obligations; 6% (1 MS) to TSOs and another 6% to the Ministry of energy.

Q7: Which action is taken in case of non-compliance with BSV obligations?

NRA from MS	*Action if non-compliance with BSV*
Austria	Not applicable, no BSV obligations in Austria.
Belgium	Not applicable, no BSV obligations in Belgium.
Bulgaria	Bulgarian legislation doesn't provide for specific measures in this regard.
Croatia	Not applicable, no BSV obligations in Croatia.
Czechia	Not applicable, no BSV obligations.
Denmark	Not applicable.
France	There is no booking obligation in France.
Germany	Not applicable, no BSV obligations in Germany.
Hungary	If the owner of the storage facility fails to comply with his obligations, MEKH may impose the following legal consequences: (a) draw the licensee's attention to the fulfilment of his obligations and oblige him to restore proper operation by setting a deadline, (b) impose a fine (c) after the expiry date, appoint another licensee to perform the tasks prescribed by law and to continue the activity of the licensee. (d) prohibit the pursuit of the activity, (e) suspend or revoke the operating license.
Italy	Not applicable, no BSV obligations in Italy.
Latvia	Not applicable, no BSV obligations in Latvia.
Netherlands	Not applicable, no BSV obligations in the Netherlands.
Poland	Financial sanctions according to the Act on Reserves.
Portugal	Not defined ex-ante but penalties will be applied under legal General Sanctioning Regime of the Energy Sector
Romania	As per the law provisions.
Slovakia	Not a legal obligation for BSV. To mitigate any operational risk and for the purpose of commercial optimisation of activity, some small contracts (optimisation contracts) foresee the use of storage capacity to ensure a continuous operation.

Spain	Not applicable.
Sweden	Not applicable, no BSV obligations in Sweden

Summary: 78% (14 MSs) answered that there is no BSV obligation in their country, while 11% (2 MSs) explained that penalties would be applied in case of non-compliance with BSV obligations. 1 MS specific explained financial sanctions as a consequence of a non-compliance case, while another MS described 5 different possible consequences: (a) draw the licensee's attention to the fulfilment of his obligations and oblige him to restore proper operation by setting a deadline, (b) impose a fine, (c) after the expiry date, appoint another licensee to perform the tasks prescribed by law and to continue the activity of the licensee, (d) prohibit the pursuit of the activity, (e) suspend or revoke the operating license.

Q8: Applicable Gas in Storage (GIS) obligations:

Are there obligations for holders of BSV to store gas? Are these GIS obligations based on: 1. security of supply requirements, 2. pro-competition requirements (e.g. anti-hoarding), 3. technical requirements (e.g. optimal technical functioning of UGS) or 4. a combination of the above (explain, also whether there is a legal or regulatory basis)?

NRA from MS	*Applicable GIS obligations*
Austria	There are no obligations on holders of booked storage capacity
Belgium	There are GIS obligations on holders of BSV. The storage contracts contain a clause that GIS must be at least 90% of BSV on 1 November (as an anti-hoarding measure) and that GIS must be at least 30% of BSV on 15 February (as a measure to guarantee optimal emission rates throughout the whole emission period (winter season). These GIS obligations (90/30 rule) are not specified in legislation and are primarily based on option 2 and 3 (included in the regulated contracts between SSO and storage user).
Bulgaria	TSO Bulgartransgaz EAD stores quantities of natural gas in the UGS Chiren, with a maximum volume of up to 70 million m3. These quantities constitute a reserve necessary to ensure security of supply requirements.
Croatia	Holders of BSV must comply with the rules determined by General Terms and Conditions of Gas Supply and Storage Code.
Czechia	There are no obligations on holders of booked storage capacity, but gas suppliers are required by legislation related to security of supply requirements to keep a 30% of gas supplies for protected customers in storage in Czechia or the EU from January to March and October to December. Most gas suppliers use confirmation of fulfilment of storage obligations from another market participant, which means that one supplier provides storage obligations for more participants
Denmark	There are no storage obligations for shippers in Denmark. However, the TSO can use the gas storage in relation to security of supply. This is based on two main elements. Element 1 – Emergency gas storage: the TSO buys emergency gas storage capacity (including storage withdrawal capacity) from the storage operator. Danish Utility Regulator has regulatory oversight of this agreement and transaction. This emergency storage capacity is filled with gas based on an auction (tender) between the TSO and the shippers (storage customers). This auction is independent of the storage operator. The TSO buys the emergency gas from the shippers, the amount corresponds to approx. 20% of storage capacity.

	Element 2 – Filling requirements: TSO arrange tenders with shippers (storage customers) for emergency filling requirements of gas storage. In the auction, the TSO buys filling requirements that oblige the shipper to have a specific amount of gas in storage during specific periods. In an emergency, the TSO has the right to use the filling requirements for ensuring security of supply in the system. More info in Section 2.5.1 and 2.5.2 https://ens.dk/sites/ens.dk/files/Naturgas/hoering_af_noedplan_-_ikke-beskyttede_gaskunder.pdf
France	Suppliers that have booked storage capacity shall actually store gas at a minimum level of 85% of their booked capacity by November 1st each year.
Germany	there are no obligations on holders of booked storage capacity
Hungary	Answer: 1-2 Security of supply requirements: Mandatory storage of natural gas for the universal service consumer (USC) Pro-competition requirements: If natural gas remains in storage at the end of the withdrawal period and if the system user does not book at least sufficient mobile gas capacity for the storage of the remaining natural gas for the next gas year, the natural gas storage licensee is entitled to sell the remaining natural gas in a transparent manner. Revenue from the difference between sales revenue and cost of sales shall be paid by the natural gas storage licensee to the system user.
Italy	There are GIS obligations on holders of BSV mainly as pro-competitive measure but of course they are beneficial for SoS and optimal technical functioning of UGS as well. Considering that the storage withdrawal capacity is directly linked to the level of gas stored in the site, to ensure a proper performance over the whole winter period it is necessary not only to have storage sites as full as possible at the beginning of the gas year, but also to impose certain limitations to the daily withdrawals to avoid storage being emptied too soon. In particular, the space capacity of the peak modulation service is associated with a volume band of the withdrawal capacity defined in order to ensure compliance with the provisions of article 2, paragraph 1 of the ministerial decree of 15/02/2013 (legal basis), or subsequent regulatory provisions, in terms of maximum volumes that can be withdrawn by the shipper. These maximum volumes that can be withdrawn are published on storage operator's website.
Latvia	There are no obligations on holders of booked storage capacity in Latvia
Netherlands	There are no obligations on holders of booked storage capacity
Poland	Obligation to maintain the mandatory stocks are based on (1) security of supply requirements up to the level of the mandatory gas volumes described in the administrative decisions. The Act on Reserves indicates that mandatory stocks mitigate the effects of: a) national fuel security risks, b) an emergency situation in the gas network, c) unforeseen increase in natural gas consumption.
Portugal	There are obligations for strategic reserves defined by law, related to security of supply requirements and so there are obligations for gas storage.

Romania	A combination of the above: For the TSO the storage obligation regards the physical balance of the transport network and for the suppliers the obligation is connected at the security of supply requirements for the end users. (The Energy Law 123/2012 and ANRE Order 36/2019)
Slovakia	There are no obligations on holders of booked storage capacity. In case GIS is a Gas in Storage requirement the SSO is directly responsible for monitoring and reporting on a yearly basis to the Mining Authority.
Spain	There's obligations for users which supply final customers based on security of supply requirements. Please see answer to Q1.
Sweden	There are no obligations on holders of booked storage capacity

Summary: 11 NRAs (61%) report the existence of gas in storage obligations (GIS), while the remaining 7 NRAs (39%, Austria, Denmark, Germany, Latvia, Netherlands, Slovakia, and Sweden) inform of no storage obligations. Where applicable, obligations are related to obligations of gas suppliers to keep gas volumes in storage sites/system, technical requirements for optimal functioning of storage sites, and anti-hoarding anticompetitive measures. A summary of the main GIS obligations per MS is provided below:

- **Belgium.** GIS must be at least 90% of BSV on 1 November (as an anti-hoarding measure) and at least 30% of BSV on 15 February.
- **Bulgaria**. GIS should ensure gas security of supply requirements.
- **Czechia.** Gas suppliers are required by legislation related to security of supply requirements to keep a 30% of gas supplies for protected customers in storage in Czechia or EU from January to March and October to December. There are no obligations on holders of booked storage capacity.
- **France.** Suppliers that have booked storage capacity shall actually store gas at a minimum level of 85% of their booked capacity by November 1st each year.
- **Hungary**. Security of supply requirements: mandatory storage of natural gas for the USP, with pro-competition requirements (antihoarding capacity measures)
- **Italy.** GIS obligations on holders of booked storage volumes mainly as pro-competitive and beneficial measure for SoS. Certain limitations to the daily gas withdrawals to avoid storage being emptied too soon, as storage withdrawal capacity is directly linked to the level of gas stored. Maximum volumes that can be withdrawn are to be compliant with a Ministerial decree and published on storage operator's website.
- **Poland**. Obligation to maintain mandatory stocks are based on security of supply requirements up to the level of the mandatory gas volumes described in the administrative decisions.
- **Portugal**. Obligations for strategic reserves defined by law, related to security of supply requirements.
- **Romania.** Suppliers' obligation connected to the security of supply requirements for the end users.
- **Spain.** Storage users (gas suppliers) have the obligation to store 20 days of annual firm sales to final consumers (strategic reserves), as well as the possibility to store 60 days of household consumption and 10 days of other firm sales (operative reserves).

Q9: Who (e.g. SSO, NRA, etc.) is responsible for monitoring compliance with GIS obligations?

NRA from MS	*Who responsible for monitoring compliance with GIS obligations*

Austria	not applicable
Belgium	SSO Fluxys Belgium monitors the GIS patterns of the holders of BSV
Bulgaria	Bulgarian Ministry of energy.
Croatia	SSO is responsible for monitoring compliance with GIS obligations.
Czechia	NRA monitors and evaluates compliance with the storage obligation in the Czechia
Denmark	not applicable.
France	The French Ministry for Energy is responsible for monitoring the suppliers' compliance with GIS obligations. SSOs must transmit the filling information per supplier by November 15th every year.
Germany	not applicable
Hungary	Free market: SSO in case of USP: MEKH, Hungarian Hydrocarbon Stockpiling Association, whose task is to establish and maintain the safety stockpile and to create the necessary conditions for this
Italy	the SSOs are responsible for monitoring compliance with GIS obligations
Latvia	Not applicable, no GIS obligations in Latvia
Netherlands	not applicable
Poland	The President of ERO.
Portugal	The TSO is responsible for monitoring the GIS obligations and the Energy Ministry is responsible for supervising and ERSE is responsible for implementing sanctions. The Government is responsible for monitoring the compliance of the strategic obligations of market suppliers
Romania	ANRE
Slovakia	GIS is Gas in Storage requirement – it is SSO who is directly responsible for the monitoring and report on a yearly basis is sent to Mining Authority a report on operation. Nafta further provide technical / geological prospection and dynamic models: The mapping created by us using ArcGIS software is unique in Slovakia in such a way that it allows an overview of individual wells and allows users to find out their current technical condition. The purpose was to inform the general public about the latest developments in the subject under examination. The database leads to a clear overview of the technical conditions of the wells, on the basis of which they can evaluate the overall safety of well operation. The interpretation of these data can provide gas companies with the strategic needs of the state and create additional capacity in the storage of natural gas in the Slovak Republic. The algorithm interpreted in the article is applicable not only to gas wells but also to oil, geothermal and hydrogeological wells.
Spain	CORES is the stockholding entity responsible for maintaining the strategic reserves of oil products and controlling oil product and natural gas industry stocks in Spain
Sweden	Not applicable

Summary: As regards the responsibility for monitoring compliance with GIS obligations, where applicable, there are different models across the EU. In general, there is a regular monitoring from the storage operators. In the case of regulated storages, SSO report to public authorities (Ministries, NRAs) and in some instances to oil and gas national stockpiling associations (Hungary and Spain). Most MS with negotiated storages (Austria, Denmark,

Germany, Latvia, Netherlands, and Sweden) have not identified actors responsible for compliance, as GIS obligations are generally not applicable.

Q10: Which action is taken in case of non-compliance with GIS obligations?

NRA from MS	*action taken in case of non-compliance with GIS obligations*
Austria	Not applicable
Belgium	There is a "use-it-or-loose-it" (UIOLI) regime applicable in case of non-compliance where storage capacity is offered again on the market, mainly in case of congestion. Authorities (e.g. Ministry and NRA) are informed about non-compliance and may take further actions if needed. Two levels: obligation in storage agreement (SSA) to sell unused capacity on the secondary market; congestion rules in special attachment of the storage code (ACS)
Bulgaria	Bulgarian legislation does not provide for specific measures in this regard.
Croatia	SSO has the right to limit or suspend the contracted service if the Holder does not comply with its contractual GIS obligations
Czechia	A fine of up to CZK 50,000,000 or 1% of the net turnover achieved by the license holder for the last completed accounting period may be imposed for of non-compliance with GIS obligations.
Denmark	not applicable.
France	The Ministry for Energy can impose a financial sanction to the suppliers that do not respect the GIS obligation as of 1st November each year.
Germany	not applicable
Hungary	Free market: If natural gas remains in storage at the end of the withdrawal period and if the system user does not book at least sufficient mobile gas capacity for the storage of the remaining natural gas for the next gas year, the natural gas storage licensee is entitled to sell the remaining natural gas in a transparent manner. Revenue from the difference between sales revenue and cost of sales shall be paid by the natural gas storage licensee to the system user. USP: If the owner of the storage facility fails to comply with his obligations, MEKH may impose the following legal consequences: (a) draw the licensee's attention to the fulfilment of his obligations and oblige him to restore proper operation by setting a deadline, (b) impose a fine (c) after the expiry date, appoint another licensee to perform the tasks prescribed by law and to continue the activity of the licensee. (d) prohibit the pursuit of the activity, (e) suspend or revoke the operating license.
Italy	there is a UIOLI regime applicable in case on non-compliance with GIS obligations
Latvia	Not applicable, no GIS obligations in Latvia
Netherlands	not applicable
Poland	Financial sanctions according to the Act on Reserves
Portugal	Not defined ex-ante but penalties will be applied.
Romania	In accordance with the provision of The Energy Law 123/2012.

	There are anti-hording rules in place until 01.04.2022, in accordance with ANRE Decision no 824/2004.
Slovakia	N.A.
Spain	When a non-compliance is detected, CORES communicates it to CNMC. CNMC analyses if there is a non-compliance, and then proposes a sanction to the Ministry that approves it. Sanctioning procedures conclude with an economic sanction. CNMC is responsible for these files
Sweden	Not applicable

Summary: For MSs with GIS obligations and measures to sanction non-compliance, NRAs report four type of measures: use-it-or-loose-it (UIOLI) regime applicable where not used storage capacity is offered again on the market (e.g. Belgium, Hungary, Italy), Oversubscription and buy back (OSBB) mechanism (Spain)[32], fines (Czechia, France, Hungary, Poland, Portugal, Spain) and a possibility to suspend or revoke licenses or suspend contracts for use of storage (e.g., Croatia, Hungary).

Q11: Public information on legal/regulatory/contractual storage documents

NRA from MS	*link*
Austria	not applicable
Belgium	Fluxys Belgium Stadaard Storage Agreement (SSA) and Access Code for Storage (ACS) approved by CREG, https://www.fluxys.com/en/products-services/empowering-you/terms-conditions/tandc_fluxysbelgium-storage
Bulgaria	https://www.bulgartransgaz.bg/file/download/5553887fc81106320e341f72cfed30a61d0b39e9
Croatia	https://www.psp.hr/6-1-storage-code
Czechia	Energy Act | MPO https://www.mpo.cz/en/energy/energy-legislation/cr-legislation/energy-act--221616/ Decree on the state of emergency in the gas industry and the method of ensuring the security standard of gas supply – Vyhláška MPO č. 344/2012 Sb. ve znění vyhlášky MPO č. 215/2015 | MPO (Czech Only)
Denmark	Answer: https://gasstorage.dk/Rules

[32] OSBB is about to be approved for underground storages, for the capacity that is allocated through auctions.

France	Loi n°2017-1839 du 30 décembre 2017 mettant fin à la recherche ainsi qu'à l'exploitation des hydrocarbures et portant diverses dispositions relatives à l'énergie et à l'environnement https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000036339396#:~:text=Dans%20les%20r%C3%A9sum%C3%A9s-,LOI%20n%C2%B0%202017%2D1839%20du%2030%20d%C3%A9cembre%202017%20mettant,%C3%A0%20l'environnement%20(1) See in particular Article L421-7 on the filing obligation Arrêté du 9 mai 2018 précisant certaines dispositions relatives au stockage souterrain de gaz naturel https://www.legifrance.gouv.fr/loda/id/JORFTEXT000036936721 See in particular Articles 1 for the details on how the financial sanction is calculated and Article 2 on the level of filling obligation (85%)
Germany	not applicable
Hungary	https://uj.jogtar.hu/#doc/db/62/id/A0800040.TV/ts/20210701/lr/39 https://uj.jogtar.hu/#doc/db/62/id/A0800040.TV/ts/20210701/lr/119 https://uj.jogtar.hu/#doc/db/1/id/A0900019.KOR/ts/20210901/lr/30 https://mfgt.mvm.hu/en/Ugyfelek/Szabalyozas-es-eljarasok/Uzletszabalyzat https://mmbf.hu/en/web/guest/documents_/documents/business_code
Italy	Italy: https://www.arera.it/it/docs/19/067-19.htm + Access codes for the 3 SSOs (approved by ARERA) https://www.snam.it/export/sites/snam-rp/repository-stg/file/en/business-services/storage-code-tariffs/storage-code/code/Storage_Code_2021_rev-I.pdf https://www.edisonstoccaggio.it/it/business-e-servizi/codice-di-stoccaggio/consulta-codice-di-stoccaggio/ https://www.igs.eu/_files/download/Ital%20Gas%20Storage_Codice%20di%20Stoccaggio_2020.pdf
Latvia	Not applicable, no GIS obligations in Latvia
Netherlands	not applicable
Poland	Act on Reserves – available on the Journal of Laws' website at: https://dziennikustaw.gov.pl/DU/rok/2021/pozycja/2249 (there is no translation from Polish to English or another languages).
Portugal	General legal framework for the gas sector [Decree-Law 62/2020]: https://files.dre.pt/1s/2020/08/16800/0000800160.pdf Regulation concerning mandatory reserves in effect by October 2021 [Portaria 297/2011]: https://dre.pt/dre/detalhe/portaria/297-2011-146217 New regulation for mandatory reserves, in effect since January 2022 [Portaria 59/2022]: https://dre.pt/dre/detalhe/portaria/59-2022-178264072
Romania	Not applicable
Slovakia	Nafta and Pozagas (SSOs) Rules of operations (approved by URSO), http://www.pozagas.sk/cms_files/file-852.pdf https://www.nafta.sk/sites/default/files/2021-04/2015.03.30_rules_of_operation.pdf https://www.urso.gov.sk/zakony/

Spain	Answer: https://www.enagas.es/enagas/es/Gestion_Tecnica_Sistema/Contratacion_de_Capacidad/Asignacion_de_capacidad_AASS/Historico_Asignaciones https://www.boe.es/buscar/doc.php?id=BOE-A-2015-11725 https://www.boe.es/buscar/pdf/2004/BOE-A-2004-15457-consolidado.pdf https://www.cnmc.es/sites/default/files/2912139_2.pdf https://www.cores.es/es/seguridad-suministro/gas-natural
Sweden	Not applicable

Summary: NRAs report publicly available information on legal, regulatory and contractual documents. With a few exceptions, this is information is not available in English. This level of publicity is generally lower for MS with negotiated storage.

Q12: What is the storage tariff regime in place? Q13. How are tariffs set?:

Definitions partly sourced from the CEER report on barriers for gas storage product development, April 2017 (link)

1. Regulated: regulated tariffs fixed by an administrative decision of a regulatory or governmental body.
2. Negotiated: negotiated tariffs between facility owner and storage user, no administrative intervention. Indicative prices may be published.
3. Indexed: the tariff is linked to the summer/winter price spread
4. Auction: the value of the tariffs results from an auction
5. Other: none of the options above

Please describe the main considerations you deem relevant. In case that different tariff regimes / pricing methodologies are applied per distinct SSOs please inform about all options.

		How are tariffs set?					
NRA from MS	Description of storage tariffs	1. Regulated	2. Negotiated	3. Indexed	4. Auction	5.others	Description of tariff setting
Austria	negotiated tariff with a price-cap		X	X	X		2, 3 and 4; and published prices by SSOs; links for OGS Gas Storage, RAG Energy Storage, Uniper Energy Storage, Astroa, GSA see https://www.gie.eu/transparency/gse-transparency-template/
Belgium	regulated tariffs (and regulated TPA) is applied. Standard storage agreement and access code	X			X		(1) regulated tariffs approved by CREG and (4), but next explanation is important. There is a scheme to use a regulated auction mechanism for storage capacity allocation in case that not all capacity can be sold at regulated tariffs. https://www.fluxys.com/en/products-services/activities/storage#/

NRA from MS	Description of storage tariffs	How are tariffs set? 1. Regulated	2. Negotiated	3. Indexed	4. Auction	5.others	Description of tariff setting
	(products) are approved by CREG. There is a scheme to use a regulated auction mechanism for storage capacity allocation in case that not all capacity can be sold at regulated tariffs						
Bulgaria	Regulated tariffs. The NRA approved the tariffs on the basis of approved allowed revenues generated at application of the method of regulation "rate of return" (cost plus)	X					Regulated tariffs fixed by an administrative decision. Please add link to SSOs tariffs' website: https://www.bulgartransgaz.bg/files/useruploads/files/prozrachnost-tarifi/Prices_Storage_en.pdf
Croatia	Regulated tariff based on the method of incentivised regulation. The regulatory period is a multi-annual	X					Regulated tariffs approved by HERA; regulation is based on the method of incentive regulation. The regulatory period is a multi-annual period in the duration of five years, and allowed revenues and tariffs are determined separately for each year of the period. SSOs tariffs' website: https://www.psp.hr/5-1-prices

NRA from MS	Description of storage tariffs	How are tariffs set? 1. Regulated	2. Negotiated	3. Indexed	4. Auction	5.others	Description of tariff setting
	period in the duration of five years, and allowed revenues and tariffs are determined separately for each year of the period.						
Czechia	Negotiated tariff regime based on auction mechanism		X		X		4. for standard bundled products with final prices published by SSOs, 2. or 4. for additional products with price set by SSO or by the highest price offered. Please add link to SSOs tariffs' website: https://www.rwe-gasstorage.cz/en/transparency/auction-overview https://www.gasstorage.cz/en/storage-capacity-trading/auction-terms/ https://www.moraviags.cz/en/storage-capacity-trading/auction-terms/
Denmark	n-TPA, storage operator publish indicative prices for storage year. Also, regular auctioning		X		X		2+4 Please add link to SSOs tariffs' website: https://gasstorage.dk/About-our-products

		How are tariffs set?					
NRA from MS	Description of storage tariffs	1. Regulated	2. Negotiated	3. Indexed	4. Auction	5.others	Description of tariff setting
	with reservation price and standard terms						
France	Other: storage operators are regulated but no regulated tariff is set. The cost of storage is the result of the auctioning process	X			X		Resulting from an auction The French NRA sets the level of the allowed revenue for each SSO. Storage capacities are marketed at auctions that take place several times a year. Auctions are single round with uniform price, each player submits a desired quantity curve according to the price. The operators add up the requests and deduce the single auction price (pay as cleared), corresponding to the maximum price for which all the capacity on sale is purchased (demand = supply). If the total demand is lower than the capacity on sale, the auction price is equal to the reserve price. 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, corresponding to the difference between the average over the 10 days preceding the auction of the winter/summer spread observed for the storage year in question and a normative value of the storage costs for this same year

		How are tariffs set?					
NRA from MS	Description of storage tariffs	1. Regulated	2. Negotiated	3. Indexed	4. Auction	5.others	Description of tariff setting
Germany	Negotiated access on reasonable and non-discriminatory technical and economic terms, no regulated tariffs		X		X		2. Negotiated between parties, 4. Resulting from an auction,
Hungary	Regulated tariff: MEKH conducts a cost review prior to the price regulation cycle, on the basis of which it determines the initial fees. The costs are reviewed annually during the cycle. However, the law allows for the application of the negotiated tariff, if there is effective competition in the domestic natural gas storage market, the Authority may decide to introduce negotiated natural gas storage access.	X			X		Answer: 1, 4 USP: Prior to a new price regulation cycle, the Authority conducts a cost review based on the data provided by the licensee with the involvement of external experts. The review includes static, dynamic, transfer pricing and benchmark analysis. Based on a published methodological guide, it determines the eligible costs, RAB, WACC which form the basis of the fees. Free market: Auctions, organized by the storage licensee Please add link to SSOs tariffs' website: https://mfgt.mvm.hu/hu-HU/Ugyfelek/Tarifa-kalkulator https://mfgt.mvm.hu/Ugyfelek/Szolgaltatasok-es-dijak https://mmbf.hu/en/web/guest/clients/actual/tariffs http://www.mekh.hu/kereso

		How are tariffs set?					
NRA from MS	Description of storage tariffs	1. Regulated	2. Negotiated	3. Indexed	4. Auction	5.others	Description of tariff setting
Italy	Regulated tariffs and regulated TPA. For allocation of seasonal storage, which follows auction procedures with reference prices below the tariff level, tariffs are only used as a reference for calculating revenue compensation. Standard storage agreement and access code (products) are approved by ARERA.	X			X		regulated tariffs fixed by ARERA (1). For allocation of seasonal storage, the price paid by storage users results from auctions (4) https://www.snam.it/en/storage/storage-code-tariffs/storage-tariffs/index.html https://www.edisonstoccaggio.it/en/business-and-services/offered-services/tariffs/ https://igs.eu/la-nostra-offerta/comunicazioni-operative/tariffe/index?com.dotmarketing.htmlpage.language=
Latvia	Not applicable, no BSV and GIS obligations in Latvia	X			X		Regulated tariffs (1) approved by PUC combined with (4). Storage user is obliged to pay the SSO for the allocated capacity product in accordance with storage service tariffs and the premium determined in the storage capacity auction procedure. Link to SSOs tariffs' website: https://www.conexus.lv/storage

		How are tariffs set?					
NRA from MS	Description of storage tariffs	1. Regulated	2. Negotiated	3. Indexed	4. Auction	5.others	Description of tariff setting
Netherlands	negotiated tariff		X		X		negotiated between parties or resulting from an auction; not published by SSOs.
Poland	Regulated tariff regime.	X					Regulated tariff regime: a) SSO calculates the storage charges based on cost plus methodology, b) according to the Energy Law the minimum WACC is 6% (pre-tax, nominal), c) WACC x RAB is included in allowed revenue, d) tariff period – 12 months, e) the President of ERO approves or denies to approve SSO tariff.
Portugal	Regulated tariff regime	X			X		Regulated tariffs approved by ERSE and (4) auction mechanism for storage capacity allocation in case of contractual congestion. Link to SSOs tariffs' website: https://mercado.ren.pt/EN/Gas/MarketInfo/Rates/Pages/RNTIAT.aspx
Romania	Natural gas storage is no longer a regulated activity as of April 1, 2021. The tariff is calculated by SSO in accordance with its own tariff setting procedure.	X					The tariff is calculated and published by SSO in accordance with its own tariff setting procedure, approve by ANRE Please add link to SSOs tariffs' website: https://www.depogazploiesti.ro/application/files/3616/1494/7807/Tarife_2021-2022.pdf http://www.depomures.ro/ciclu_inmagazinare11.php

		How are tariffs set?					
NRA from MS	Description of storage tariffs	1. Regulated	2. Negotiated	3. Indexed	4. Auction	5.others	Description of tariff setting
	The procedure is approved by ANRE.						
Slovakia	negotiated tariff		X		X		Negotiated or resulting from an auction, and each SSO publish its own price list of services http://www.pozagas.sk/cms_files/file-1022.pdf https://isodzz.nafta.sk/yCapacity/#/?nav=ss.pl&lng=EN
Spain	Regulated tariff for capacity allocated directly and the price resulting in the regulated auction mechanism, which reference price is the regulated tariff.	X			X		(1) regulated tariffs fixed by the Ministry for Ecological Transition and Demographic Challenge + (4) the capacity not allocated by the direct allocation mechanism is allocated through standardized products which reference price is the regulated tariff. Please add link to SSOs tariffs' website: https://www.boe.es/eli/es/o/2020/12/29/ted1286
Sweden	Negotiated tariff with a price-cap		X		X		Negotiated or resulting from an auction Please add link to SSOs tariffs' website: https://www.swedegas.se/vara_tjanster/tjanster/lagring/villkor_och_avgifter
18		**11**	**6**	**1**	**13**	**0**	
		61%	**33%**	**6%**	**72%**	**0%**	

Summary: Different tariff and access to storage regimes coexist across EU MS. 11 NRAs report a regulated access to storage, while the remaining 7 NRAs report a negotiated access regime. Negotiated access takes place on the basis of reasonable and non-discriminatory technical and economic terms, with reference tariffs published in most cases. As regards the way tariff values are set, it is frequent that the value of regulated tariffs is the result of an auction for capacity storage (e.g. Belgium, France, Hungary, Italy, Latvia, Portugal, Spain), being auctions also widely used to set the values of negotiated tariffs.

Q14. What are the capacity products offered?

(please select all the options offered by SSOs in the MS)?: 1. Standard bundled products, 2. Unbundled products, 3. Storage products delivered at hub, 4. Pooled storage, 5. Virtual products, 6. Cross-border products

Definitions taken from the CEER report on barriers for gas storage product development, April 2017 (link)

Standard bundled products	A Standard Bundled Unit (SBU) comprises a ratio of injection, storage space and withdrawal capacity. This ratio varies according to the storage facility in question and is usually determined by the technical characteristics of the facility Under the Third Package, SSOs are legally obliged to provide bundled products.
Unbundled products	Unbundled products refer to the ability to purchase separate injection, space or withdrawal capacity. Under the Third Package, SSOs are legally obliged to provide unbundled injection, space and withdrawal.
Storage products delivered at hub	Some SSOs have developed storage products with delivery of gas at the trading hub. In these cases, the SSO is responsible for booking transmission capacity which is incorporated into the price of the storage product. The storage user's nominated gas is delivered at the VTP with no need to purchase separate transmission capacity to/from the facility. This may offer benefits to storage users, in particular smaller market participants, by reducing potential complexity
Pooled storage	Pooled storage refers to a combination of different physical storage facilities that are treated commercially as a single facility. Pooled storage offers benefits to SSOs by amalgamating the physical capability of different facilities to offer products to market participants.
Virtual products	Virtual storage products are contracts which imitate the characteristics of a storage contract (i.e. injection, space and withdrawal) but are not necessarily physically backed by gas in storage. Virtual storage products can be supported by a combination of contracts including gas production, physical storage and supply contracts
Cross-border products	Cross-border storage products refer to storage products that are specifically targeted at providing storage services to market participants in a different market area. This may include, for example, the delivery at a trading hub by a storage facility that is not physically located in the relevant market area.

NRA from MS	1. Standard bundled products	2. Unbundled products	3. Storage products delivered at hub	4. Pooled storage	5. Virtual products	6. Cross-border products	Total	Description
Austria	X	X		X	X	X	**5**	
Belgium	X	x					**1**	Standard Bundled Standard Units (BSU)approved by CREG with an option to buy additional injection/withdrawal capacity and storage capacity if committed according to injection/withdrawal profile is followed
Bulgaria	X	X			X		**3**	Standard bundled products, unbundled products, and virtual products.
Croatia	X	X					**2**	1. Standard Bundled Units (SBU), 2. Unbundled products-Individual firm services (working volume; firm injection capacity; firm withdrawal capacity),Individual interruptible lease services (Interruptible not-nominated injection capacity on a daily basis/ interruptible not-nominated withdrawal capacity on a daily basis), Non-standard services
Czechia	X	X		X	X		**4**	1,2,4,5
Denmark	X		X	X	X		**4**	2. Unbundled short-term (but also bilateral, call options, gas loan etc). Storage operator are not bound by offering a specific type of product. Transport to and from storage is at no cost, so de-facto delivery at hub (3). Storage operator offers One-Storage products, one "virtual" product but two storage sites (4).
France	X						**1**	1. Standard bundled products

NRA from MS	1. Standard bundled products	2. Unbundled products	3. Storage products delivered at hub	4. Pooled storage	5. Virtual products	6. Cross-border products	Total	Description
Germany	X	X	X	X	X	X	**6**	1. Standard bundled products, 2. Unbundled products, 3. Storage products delivered at hub, 4. Pooled storage, 5. Virtual products, 6. Cross-border products
Hungary	X	X	X	X	X	X	**6**	1-6 (if the customs warehousing service qualifies as a cross-border product)
Italy	X	X					**2**	1+2 SBU's features vary according to 4 different products: - 2 types of summer injection availability (monthly or seasonal); - 2 types of winter withdrawal availability (flat or modulate). Winter injection is available for every product. Unbundled products are available as short term capacity products, on a daily, weekly, monthly basis
Latvia	X						**1**	One-year bundled unit capacity product, two-year bundled unit capacity product, interruptible capacity product, virtual reverse flow product and stock transfer product
Netherlands	X		X		X		**3**	Answer: 1, 3 and 5
Poland	X	X			X		**3**	Option no. 1 (standard bundled products), 2 (unbundled products), 5 (virtual products).
Portugal		X					**1**	Standard Unbundled products. Injection and extraction capacities are booked independently from storage capacity. Standard products are used, compatible with transmission capacity products.

NRA from MS	1. Standard bundled products	2. Unbundled products	3. Storage products delivered at hub	4. Pooled storage	5. Virtual products	6. Cross-border products	Total	Description
								Storage capacity: Yearly, Quarterly, Monthly, Daily Injection: Daily, Intraday Extraction: Daily, Intraday
Romania	X						**1**	The capacity products are offered by TSO at the connection point between transport network and the storage system.
Slovakia	X	X	X	X		X	**5**	1. Standard Bundled Standard Units (BSU), 2. Unbundled products, 3. Virtual products, 4. Pooled storage (such as transfer of gas) 5. Cross border products, Then as for services offered: Storage Capacity (i) Seasonal Storage Capacity; (ii) Flexible Storage Capacity; (b) Individual Services related to Storage Capacity (i) Working Volume; (ii) Injection/Withdrawal Rate; (iii) Day-ahead Injection/Withdrawal Rate (iv) Within-day Injection/Withdrawal rate; (c) Supplementary services (i) Use of an additional delivery point; (ii) Change of delivery points; (iii) Transfer of gas in the Storage Facility and from/into the Linked Storage Facility; Rules of Operation effective from 1 April 2015 10 (iv) Transfer of the exercise of the rights under the Gas Storage Agreement; (v) Assignment of the Gas Storage Agreement or a part thereof; (d) Structured Services (i) Storage Capacity Option (ii) Inverse Storage Facility (iii) Value-sharing Storage; (e) Innovative Services
Spain	X	X			X		**3**	Spain: (1) Standard bundled products + (2) Unbundled products. Standard bundled products include storage,

NRA from MS	1. Standard bundled products	2. Unbundled products	3. Storage products delivered at hub	4. Pooled storage	5. Virtual products	6. Cross-border products	Total	Description
								injection and withdrawal capacities, which are annual, quarterly and monthly products. Unbundled products (store capacity, injection capacity and withdrawal capacity, booked individualized) are daily and withinday products. All products are virtual since the 4 existing UGS are operated as single virtual one.
Sweden		X					**1**	2. Unbundled products.
18	**16**	**12**	**5**	**6**	**9**	**4**		
	89%	**67%**	**27%**	**33%**	**50%**	**22%**		

Summary: All but one NRA respondent reported that the storage system operators (SSO) offer **standard bundled products**, while 67% of NRAs responded that SSO were offering unbundled products. 50% (9) of respondents selected **virtual products**, 27% (5) inform of the existence of **storage products delivered at hub** (Denmark, Germany, Hungary, Netherlands, Slovakia). **Pooled storages** are used also in 6 MSs (Austria, Czechia, Denmark, Germany, Hungary, Slovakia) and cross-border products are apparently only available in Austria, Germany, Hungary and Slovakia. NRAs report that 10 MS offer three or more types of capacity products, and all 6 type of capacity products are available in Germany and Hungary.

Q15. Storage types and the % of total MS's storage capacity that they account for

1. Depleted fields and Aquifers (large volumes to balance seasonal swings), 2. Salt caverns (optimise portfolios in shorter-term)

NRA from MS	*storage types and the % of total MS's storage*
Austria	100% depleted fields
Belgium	UGS aquifer
Bulgaria	100% for Depleted fields and Aquifers.
Croatia	100% depleted fields (seasonal storage)
Czechia	97,87 % Depleted fields and Aquifers; 2,13 % hard rock cavern
Denmark	Two storage facilities (acquifer approx. 55% and salt cavern approx. 45%)
France	There are 16 underground gas storage sites In France, 3 SSOs operate (Storengy, Teréga and Géométhane) 16 gas storage sites (11 aquifers, 4 salt caverns and 1 depleted field), 3 of which are currently mothballed (2 aquifer and 1 depleted field). Salt caverns account for 10% of working gas volume and 32% of withdrawal capacity
Germany	1. 42,59% Depleted fields and Aquifers (large volumes to balance seasonal swings), 2. 49,51% Salt caverns (optimise portfolios in shorter-term) 3. 7,90% Both- not differentiable
Hungary	100% depleted fields
Italy	100% depleted gas fields
Latvia	100% aquifer
Netherlands	97,5% depleted fields; 2,5% salt caverns
Poland	Depleted fields – 74% (26 597,2 GWh) Salt caverns – 26% (9 190,7 GWh)
Portugal	100% Salt caverns
Romania	100% Depleted fields
Slovakia	100% depleted fields
Spain	Depleted gas fields (Marismas, Serrablo and Gaviota): 84%. Saline aquifer (Yela): 16%.
Sweden	Sweden only has one storage which is a lined rock cavern.

Summary: Most of gas storage capacity in the EU corresponds to depleted and aquifers fields, which are used to store large volumes of gas to balance seasonal swings of gas demand. All MS but Portugal and Sweden report having depleted and aquifers storage sites. In addition, there are 8 NRAs reporting salt and hard rock caverns storages, representing a low but varying percentage of the total storage capacity, which are primarily use to optimise gas portfolios in the short-term as they typically allow for several gas injection and withdrawal cycles per year. Salt caverns are available in Czechia (2% of total storage capacity), Denmark (45%), France (10%), Germany (50%), Netherlands (3%), Poland (26%) and Portugal (100%). However, this information should be read with caution, as some doubts arise as regards the completeness and quality of the information.

Q16. Are GIS levels currently a concern in your country?

Are there any ongoing discussions and/or proposals to maximise GIS levels at the start of the winter season (1 October)?

NRA from MS	*GIS levels currently a concern? ongoing discussions and/or proposals to maximise GIS levels*
Austria	current storage level are monitored regularly and the situation is regularly analysed by the Market Area Manager. The storage capacity in Austria is mainly used by gas traders and gas suppliers of adjacent Member States and; only 20% of storage capacity was used in the last years for the supply to end consumers in Austria. Taking this into account the low filling levels in comparison to other Member States are not a concern. **March update**: In Austria, stricter requirements for fulfilling the security of supply standard for protected customers are under development, based on the use of storage contracts. In addition, other incentives for filling the storages are analysed to achieve a sufficient storage filling level at the beginning of the winter 2022/23.
Belgium	Current storage regime in BE is not questioned and provides for the time being satisfactory outcomes (e.g. adequate GIS level). There is a scheme to use a regulated auction mechanism for storage capacity allocation in case that not all capacity can be sold at regulated tariffs However, EU GIS levels are a point of attention in BE at the moment regarding the high gas wholesale prices (sharing the views of ACER opinion on ENTSOG's WSO 2021-2022). The Belgian UGS at Loenhout is suited for peak demands in winter and to mitigate incidents but not for SOS.
Bulgaria	Bulgartransgaz EAD submitted project proposals for partial grant financing for the expansion of the underground gas storage 'Chiren' under the Connecting Europe Facility (CEF). The results of the project proposals' evaluation are expected to be announced by CINEA in early 2022
Croatia	Podzemno skladište plina Ltd is continuously working on preparation activities for the construction of the new peak storage facility Grubisno Polje-new underground gas storage, which was included in the list of strategic investment projects of the Republic of Croatia by the decision of the Ministry of Economy. However, the project has not yet received regulatory approval.
Czechia	The liberalised storage regime in Czechia is not disputed and has so far provided a satisfying result with current storage level slightly above EU average. However, the level of storage is constantly monitored and the situation is periodically analysed by the Statistics and Market Monitoring Unit, in particular due to the current high wholesale gas prices.
Denmark	GIS levels are monitored regularly by both TSO and NRA, independently. TSO and NRA also have quarterlu meeting regarding the functioning of the market including storage usage. Filling levels have been low (compared to other years) but not alarming, with no need for emergency calls. Current level are sufficient and above safe storage level. https://en.energinet.dk/Gas/Tyra/Safe-storage-level
France	Since its entry into force in 2018, CRE draws a very positive assessment of the functioning of the storage system. The regulation led to an increase in the level of booked capacity at an overall reduced cost for the system, while guaranteeing that

	SSOs' costs are covered. This regime guarantees that the storage capacities that are necessary for the security of supply are maintained in service. At the entry in the winter season 2021-2022, the level of booked capacity was 100% and the level of gas in stock was 92% as of 1st October, and 94% as of 1st November. It thus has reached a very satisfactory level in France, compared to other regions in Europe.
Germany	After the liberalization of the German gas market, private investors have invested extensively in the expansion of gas storage capacities and are actively using them for supply. The liberalized German gas market thus meets the requirements in terms of security of supply and cost efficiency. Legal or regulatory intervention in the form of storage obligations or strategic storage facilities was not deemed necessary. In the event of possible regional extreme scenarios, e.g. extreme cold at the end of winter with simultaneous low storage levels, the market area managers are given the option of contracting a higher volume of long-term balancing energy products to further safeguard security of supply. Here, in addition to other sources of additional gas flows, gas volumes at storage facilities can also be contracted in the market. These volumes were not actually called up in recent winters. (compare doc "Regulation of long-term energy storage from a sector coupling perspective: Lessons from gas storage CEER analysis" Annex 5, point 3 **March update.** In Germany, in light of the situation in the Ukraine, the dependence of Russian gas combined with a relatively low storage filling levels during the winter 2021/22, a strictly market-based approach to storages is not perceived as the best way to cope with the upcoming challenges. Therefore, the Ministry for Economic Affairs and Climate Protection recently presented on 28 February 2022 a proposal regulating the use of storage facilities. The key points are a three-stage model combines Long-Term Options (LTOs), minimum storage filling levels and a Use-It-Or-Lose-It (UIOLI) principle for use of storage capacity, if sufficient levels of gas in storage are not reached. The aim is that the new storage regulations will come into force as early as 1 May, in time for the summer period for filling storage facilities. The details are still under discussion.
Hungary	Current storage level are monitored regularly by MEKH. There is a mandatory level only for strategic storage which was 15 374 000 MWh on 1 October 2021 and are going to be 12 723 644 MWh on 1 October 2022
Italy	Current storage regime in Italy is not questioned and provides for the time being satisfactory outcomes (e.g. adequate GIS level).
Latvia	The level of GIS in Latvia is currently not a concern. However, storage stock level is monitored regularly, and the situation is regularly analysed by PUC and SSO as the level of stocks in the storage cannot only directly affect the security of gas supply, but also indirectly - as the stocks decrease, the technical capacity of the storage decreases in the next storage cycles and it takes longer to restore the technical capacity to the previous level as well as when the level of stocks decreases, gas withdrawal capacity decreases in the respective withdrawal season.
Netherlands	We are monitoring this closely, as is the TSO and the ministry. The concerns are focussed on GIS of H-gas storages. There are ongoing discussions around minimum storage obligations and the new governing coalition has announced to have plans to take this up
Poland	GIS levels at the beginning of winter season (1st October 2021) is satisfied (97%) – no further actions are expected.

Portugal	GIS levels are not a concern but are monitored. The national consumption is not seasonal, the domestic volume is irrelevant. The actual values are now back to normal.
Romania	No, it is not currently a concern. There are no discussions yet.
Slovakia	Current storage level is monitored regularly and the situation is regularly analysed by the Market Area Manager. The storage capacity in Slovakia is mainly used by gas traders and gas suppliers of adjacent Member States and; around 30% of storage capacity was used in the last years for the supply the end consumers in Slovakia. Taking this into account the low filling levels in comparison to other Member States are not a concern.
Spain	No, in the last years, at the beginning of winter (except this year 2021), GIS is above 90%. GIS on 11 January was 22,54 TWh (quite similar to GIS on 1 October 2021).
Sweden	Sweden only has a small gas storage which currently only is filled with strategic storage (2,4 % of WGV). There is ongoing discussion with gas suppliers to fill the storage commercially. But more importantly from a SoS perspective is the GIS levels in Denmark. Danish GIS levels are monitored regularly and the situation is regularly analysed by the Swedish and Danish TSOs.

Summary: Gas in storage levels are subject to regular monitoring by the SSOs, network operations and most NRAs. The majority of NRAs, despite noting that the vigilance over gas storage levels has increased this year, do not report that current Gas In Storage (GIS) levels are a concern. In fact, there are limited ongoing discussions at national level to propose to maximise the GIS levels. Only ACM (for the Netherlands) reports current concerns focussed on GIS for high calorific value gas (H-gas) storages and ongoing political discussions around plans for setting minimum storage obligations, and Ei (for Sweden) makes reference to an ongoing discussion with gas suppliers to commercially fill the storage in Sweden and the GIS levels in neighbouring Denmark. NRAs from Member States which opted for a regulated regime for storage (e.g. Belgium, France, Italy, Poland and Spain) have a positive assessment of their national systems and note an adequate storage filling level at the start of current winter season. NRAs from MS with liberalised storage do not deem that regulatory intervention would be necessary and, in some cases (Austria, Slovakia) note that part of the available storage capacity is used by gas traders and suppliers of adjacent Member States, not necessarily correlating low storage levels in their territory with a serious concern for national gas consumers. Most of the information provided by NRAs was collected until January 2022, before the start of the armed conflict in Ukraine. Since then, national and EU initiatives to revise and strengthen storage regulation have quickly accelerated. Recently, Austria and Germany have announced plans to consider establishing storage obligations.

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	Source: ENTSOG Winter Supply Outlook 21/22 (table 11).			Source: https://agsi.gie.eu/#/ Download on 12/12/2021*		
Country	**WGV [TWh]**	**GIS** [TWh]**	**filling level [%]**	**WGV [TWh]**	**GIS** [TWh]**	**filling level [%]**
Austria	95,48	50,84	53,25	95,4801	51,1302	53,55
Belgium	9,00	7,79	86,51	9,0013	7,8504	87,21
Bulgaria	6,27	4,40	70,18	5,8135	4,4154	75,95
Croatia	5,22	4,73	90,76	5,2164	4,7044	90,18
Czechia	35,99	30,62	85,07	35,9915	30,6506	85,16
Cyprus						
Denmark	9,08	7,36	81,01	9,0800	7,5015	82,62
Estonia						
Finland						
France	128,46	115,12	89,61	128,4642	118,5640	92,29
Germany	222,43	151,17***	67,96	240,9868	163,9092	68,02
Greece	0,00					
Hungary	67,70	56,40	83,31	67,7027	56,3528	83,24
Ireland	0,00				No data	
Italy	197,73	169,14	85,54	*197,7337*	*169,3270*	*85,63*
Latvia	21,80	17,46	80,07	21,8000	17,4065	79,85
Lithuania						
Luxembourg						
Malta						
Netherlands	143,81	83,97	58,39	143,8067	84,0953	58,48
Poland	35,79	34,46	96,29	35,7879	34,4662	96,31
Portugal	3,57	1,78	49,82	3,5700	1,7813	49,90
Romania	32,99	23,82	72,19	32,9906	23,9424	72,57
Slovakia	38,75	27,30	70,46	38,7476	27,8684	71,96
Slovenia						
Spain	34,25	25,02	73,06	34,2480	25,0768	73,22
Sweden	0,01	0,01	66,35	0,0104	0,0069	66,42
EU-27	**1088,33**	**811,39**	**74,55**	***1106,4314***	***829,0493***	***74,93***

*A recent download of data for 1/10/21 on the AGSI platform provides a maximum of confirmed data. On 12/12/21, only data for Italy was still estimated for 1/10/21 on the AGSI platform. Estimated data are presented in italic, other data are confirmed on the AGSI platform.

**The data represents gas in storage at the end of the previous gas day.

***ENTSOG informed ACER, after the Outlook's publication, of a discrepancy in the GIS in Germany (156 TWh instead 151 TWh published in the Outlook). Probably there are also issues for the German WGV of 222 TWh since AGSI data provide 241 TWh.

Czech NRA noted differences compared to ENTSOG's Outlook/AGSI platform. One of possible explanations can be the difference in source of data, since not all UGS are duly reported on AGSI+ Platform.