

## **Guidelines for Good TPA Practice for Storage System Operators (GGPSSO) [NGT annotated 09-11-04]**

**Version 2004-10-06**

### **Scope and objective of the GGPSSO**

The GGPSSO are forward looking and should be flexible enough to account for developments in market arrangements. They intend to give a minimum common set of requirements for the organization of the storage facilities and operators.

They are addressed to all Storage System Operators (“SSOs”) falling under the scope of the European Directive 2003/55/EC (the Gas Directive) as well as to the users of these systems (“storage users”) *[Storage user is a defined term and the text needs to reflect this as has been done for SSO at the start of the paragraph].*

The purpose of these GGPSSO is to ensure that SSOs provide the services needed by storage users on a fair and non-discriminatory basis, taking into account technical, **economic and commercial** constraints. Storage systems and processes shall facilitate the sustainable development of competition in gas supply *[Section 9 of The Gas Act 1986 (as amended) sets the precedent for this in the UK “...to comply, so far as it is economical to do so”, with any reasonable request...” for services.]*

It shall be incumbent upon the SSOs, on a case by case basis, to demonstrate to the relevant national authorities that arrangements at storage facilities meet the following guidelines in terms of the desired outcomes. The regulatory authorities should check that results in both regimes (nTPA and rTPA) are **equal—equivalent** in terms of non-discrimination, transparency and competition *[The term equal is not appropriate in describing differing regimes].*

An overriding principle is that storage systems and processes implemented by the SSOs maintain secure, reliable and efficient operation of the storage system (Article 8(1.a) of the Gas Directive).

### **1. Roles and responsibilities of Storage System Operators**

1.1. SSOs, be they separate entities, part of a combined operator in the sense of Article 15 of the Gas Directive, or part of a vertically integrated company in the sense of Article 2(20) of the Gas Directive, shall act in accordance with the principles of non-discrimination, transparency and competition. They are responsible for the provision and management of technical storage capacity, storage services and information as well as the technical integrity and safety of storage facilities.

1.2. SSOs shall among others:

- a. operate and maintain under economic conditions secure, reliable and efficient storage facilities;

- b. offer third party access services on a non-discriminatory ~~and transparent~~ basis to all storage users requesting access to storage, including own affiliated companies, either using standard storage contracts or a storage code, developed by the SSOs, including proper consultation with users and overseen by the national regulatory authorities ***[TPA should be non-discriminatory however it is inappropriate to require transparency at nTPA sites];***
- c. establish rules on the use of capacity aimed at ensuring competitive and efficient use of that storage facility by ~~system-storage~~ users, in particular to discourage storage capacity hoarding ***['storage user' is the correct defined term];***
- d. treat confidential information, especially with regards to any affiliated company, in order to avoid any discrimination between storage users, as stated in § 5 on confidentiality requirements;
- e. provide the information required by storage users and ~~transmission~~ system operators as stated in § 6 on transparency requirements ***['transmission system operator' is the correct defined term];***
- f. co-operate with TSOs through interoperability agreements in order to ensure efficient and secure operation of storage and transportation networks;
- g. when asking ~~for~~ guarantees ~~from~~ ~~to~~ storage users, with respect to their creditworthiness, ensure that these guarantees are non-discriminatory, transparent and proportionate and do not constitute any undue market entry barrier.

## **2. Role of Storage Users**

### 2.1. Storage users shall among others:

- a. be responsible for ~~making nominations to the SSOs and for the injection and withdrawal of gas~~ ***providing gas for injection into and accepting gas on withdrawal*** from storage facilities ***and making the associated nominations*** in accordance with prevailing contractual specifications, technical rules and agreed procedures ***[This provides a more accurate wording of what a storage user actually does];***
- b. provide all data required that is necessary for the SSO to carry out its duties as specified in the storage code and/or in the storage contract;
- c. not use capacity rights in a manner that is intended to restrict, distort or prevent competition, for example through capacity hoarding;
- d. put relevant IT in place in order to be able to communicate with SSOs via agreed interfaces and standards.

## **3. Necessary TPA services**

- 3.1. Storage capacity not excluded from TPA pursuant to Article 2(9) of the Gas Directive, when technically and economically necessary for efficient access to the network, shall be offered to storage users on a non-discriminatory basis that ~~promotes-facilitates~~ ***the development of*** competition and ~~facilitates~~ trade. Therefore, the SSO shall offer to storage users the maximum available storage capacity (i.e. technical storage

capacity), apart from that part of the storage capacity used for operational needs related to transmission and/or production, according to rules made transparent by the national regulatory authorities. Exclusion of storage capacity from TPA shall not be the decision of the SSO and/or the beneficiary of the storage capacity exempted from TPA and shall be approved by the national regulatory authorities, with the publication of substantiated reasons ***[SSOs cannot promote competition, only facilitate it]***.

- 3.2. The amount of storage capacity needed for PSO and security of supply, when imposed on storage users, should be offered on a TPA basis; requirements of non-discrimination still apply. Whichever party is responsible for PSOs, it shall demonstrate upon request to the national regulatory authority that their requested capacity reservation is no more than what is required to satisfy the relevant PSO.
- 3.3. The SSO shall offer to storage users the storage capacity in a form that facilitates competitive, non-discriminatory, and efficient access to best meet storage users' needs and that facilitates trade in storage services in secondary markets. Specifically the SSO shall offer in the primary market, pursuant to its responsibilities under § 1, in consultation with storage users and taking into account storage technical constraints, a menu of services, including the following:
  - a. ~~bundled services (SBU) of space and injectability/deliverability with determined technical ratios~~ capacity will be substantially sold as bundled services (SBUs) of injectability, space and deliverability with determined technical ratios ***[This allows storage users to secure a 'complete' storage service]***;
  - b. ~~unbundled services in an appropriate range with SBUs~~ the above will be complemented by unbundled services where commercially & economically viable and where requested by storage users ***[This is more relevant to reservoirs and aquifers whereby additional space may become available as an injection run progresses]***;
  - c. ~~an appropriate range of both long term (> 1year) and short term firm services (<1year) down to a minimum period of one day~~ an appropriate range of both long-term (> 1 year) and short term firm services (< 1 year) down to a minimum period of one day where requested by storage users ***[UK storage traditionally operates on a annual (summer / winter) cycle which is consistent with the current UK market demand]***;
  - d. ~~short term interruptible storage contracts and services.~~ short term interruptible storage contracts and services through the release of unutilised injectability, space and deliverability (Use It Or Lose It) ***[May be useful to refer the anti-hoarding text within § 4.3]***.

The primary aim is to ensure SSOs provide flexible services, where commercially & economically viable, such that storage users are able to shape the storage service required through the SSO releasing bundled, unbundled & interruptible services as appropriate.

- 3.4. When compatible with the balancing regime of the interconnected gas transportation system, the SSO shall offer a service, which includes an obligation to allocate the gas ~~which that~~ has been nominated ***[See comments in § 6.6]***.
- 3.5. SSOs shall offer services that are consistent with the use of the interconnected gas transportation systems.

- 3.6. Taking into account technical, **economic and commercial** constraints and if consistent with PSOs obligations, the SSO shall offer all services without restrictions on the starting date and the ~~actually~~ prevailing physical flow. With the same constraints, injection and withdrawal of gas should, in principle, be possible at any time. Limits on the required minimum size of storage capacity rights shall be justified on the basis of technical, **economic and commercial** constraints and permit smaller ~~shippers-storage users~~ to gain access to storage services. Storage users should be allowed to pool **nominations** with each other with a view to overcome potential technical capacity thresholds *[SSOs should not be forced to offer services that are uneconomic. Furthermore NGT seek clarification on what is meant by the starting date]*.
- 3.7. The SSO should develop information systems and electronic communication to provide adequate data to storage users and simplify transactions (such as nominations, capacity booking and transfer of capacity rights between storage users) **subject to agreed transitional arrangements** *[This allows SSOs use manual systems prior to other IT solutions being developed, there is no reasonable argument for IT solutions to be developed from 'day-one']*.
- 3.8. ~~Deadline for the implementation of such requirements is 1 April 2005; if SSOs have problems in implementing measures envisaged under § 3, in particular with regard to IT systems, they shall provide an explanation to the national regulatory authorities setting out the problems in implementing this deadline and present a concrete action plan for their implementation, taking into account, if applicable, the size of the company.~~ **There will be a transitional implementation of these requirements between 1 April 2005 to 1 April 2007** *[A transitional implementation will be required due to the varying stages of progress towards TPA across Europe]*.

#### **4. Storage capacity allocation management and congestion management**

- 4.1. Storage capacity allocation mechanism and congestion management procedures shall:
- a. facilitate the development of competition and liquid trading of storage capacity and be compatible with market mechanisms including spot markets and trading hubs while being flexible and capable of adapting to evolving market circumstances and discourage hoarding;
  - b. take into account the integrity of the storage system concerned as well as security of supply where relevant legal rules are incumbent upon the SSO;
  - c. not create undue barriers to market entry and not prevent **any storage user, including those with a small market share, market participants, including new market entrants and companies with a small market share,** ~~from competing effectively.~~
  - d. ensure the maximum availability and efficient use under economic and non discriminatory conditions of technical storage capacity;
  - e. **ensure that the sales processes and revenues achieved** generate the right signals for investment in new **storage capacity and associated** infrastructures. *[A capacity allocation mechanism itself can not generate the right*

*investment signals' however it can ensure that SSOs do not have to allocate capacity if the sale proceeds and revenues are not sufficient];*

- f. be subject to consultation with storage users.
- 4.2. In case of physical congestion **and subject to economical conditions**, non discriminatory, market-based solutions shall be applied by the SSO or by the national regulatory authorities, where appropriate. Also, the SSO or the national regulatory authorities shall appropriately balance the portion of storage capacity contracted under multi-annual long-term contracts and short term contracts, with the aim of promoting effective competition. Alternative allocation procedures such as pro-rata mechanisms may be considered if they ensure equivalence in terms of non-discriminatory and competitive access.
- 4.3. The SSO shall actively endeavour to discourage hoarding and facilitate re-utilisation and trade of storage capacity by all reasonable means, including at least the offer on interruptible basis of all unused capacity (e.g. day-ahead release of non-nominated injectability and deliverability).
- 4.4. If, in spite of the **commercial incentives measures** aimed at preventing ~~any commercial incentives to~~ hoarding of capacity, namely secondary market and interruptible storage services, capacity contracted under existing storage contracts remains unused and significant and prolonged contractual congestion occurs, the national regulatory authorities shall require the SSO to introduce additional mechanisms to free up this capacity.

## **5. Confidentiality requirements**

- 5.1. The SSO shall meet the confidentiality provisions of Article 10 of the Gas Directive, by guaranteeing that:
- a. commercially sensitive information from storage users' account remains confidential. Any information available to the SSO concerning its storage and processing business shall not be passed to other possible parts of the company in advance of being provided to all market participants; staff working for the affiliate business if any (e.g. supply) should **not** have ~~no~~ access to information which could be commercially advantageous, such as details on ~~actual or potential~~ storage users, and **/ or information that is not in the public domain** ~~made available to all market parties~~. The arrangements to implement this requirement should include a code of conduct for staff/compliance programme, supervised by a Compliance Officer;
- b. in case of an integrated company operating supply and/or production and storage business or when there are no separate database systems, specific confidentiality duties must be clearly defined; the relevant national regulatory authorities shall at least require sufficient evidence from companies concerned so as to prove an effective establishment of Chinese walls between the SSO and the supply and/or production branch of the vertically integrated companies. The arrangements to implement this requirement should include a code of conduct for staff/compliance programme, supervised by a Compliance Officer, which should embody the principles behind the Chinese walls concept. Cost effective solutions should be implemented to ensure that the SSO and the supply business are not

located in the same place. Preferably, the SSO and the supply business should be located in separate buildings, provided such a measure is proportionate given the size of the activity concerned.

## 6. **Transparency requirements**

- 6.1. SSOs should implement user-friendly systems to publish the information needed by storage users in a timely manner in the national language and in English on the Internet. ~~Information should be provided on a real time basis, if required by storage users.~~ Information shall be disclosed in a meaningful, quantitatively clear and easily accessible way and on a non-discriminatory basis *[The costs of providing information on a real-time basis are estimated to be prohibitively high and not justifiable. End of day hourly information on injection and withdrawals has proved sufficient for storage users within the UK. Furthermore this should also be an area for full consultation and not only when 'required by storage users']*.
- 6.2. Information relating specifically to a storage user's account must be kept confidential. Non confidential information must be provided promptly and on the same time scale as to all **storage** users on a non discriminatory basis. Where a SSO considers that it is not entitled for confidentiality reasons to make public all the data required, it shall provide clear evidence to the national regulatory authorities and seek its authorization to limit publication. The relevant national authorities shall grant or refuse the authorization on a case by case basis and publish the substantiated reasons. This assessment should be renewed on a regular basis.
- 6.3. The SSO shall submit for approval to the national regulatory authorities any request not to publish specific data (e.g. for reasons of costs or to avoid any potential market abuse). The relevant national authorities shall grant or refuse the authorization on a case by case basis and publish the substantiated reasons.
- 6.4. The following commercial terms should be published with online information system:
  - a. in rTPA, the tariffs **or tariff methodologies** for each service offered shall be published ex ante ~~with the derivation criteria attached (i.e. the underlying technical and economic reasons for establishing them)~~. In nTPA, the main commercial conditions including the prices for core standard services must be published and updated whenever the SSO changes them; prices and underlying criteria should be made available to the national regulatory authorities ~~at least~~ in case of disputes *[publication of tariffs is not possible for an auction based system of capacity allocation]*;
  - b. services offered, the storage code (if applicable) and/or the main standard conditions for each service outlining the rights and responsibilities for all **storage** users **(including rights for counter-flow injection and withdrawal nominations) and rules relating to transfer of capacity and gas in store including flexibility tolerances (e.g. counter flows during injection or withdrawal) and the rules of transfer storage capacity in case of final customer switching [It is not clear what is meant by flexibility tolerances]**;
  - c. method of determining available storage capacity and the operational parameters including transparency on the rules of ownership and use of working gas **should**

- be made available to the relevant authority upon request [These are not strictly commercial terms hence should not be obliged to publish];**
- d. storage capacity allocation, congestion management and anti-hoarding and re-utilization provisions, including auctions terms where applicable and rules applicable for storage capacity trade on the secondary market vis-à-vis the SSO;
  - e. the rules and the charges applicable to storage penalties due by storage users and compensation payments by the SSO to storage users.
- 6.5. The following operational information shall be published with online information system (in energy units, according to interoperability criteria) to provide **system storage** users with sufficient and timely information in order to gain effective and efficient access to storage facilities **provided there is no breach of confidentiality with information related to storage users:**
- a. ~~storage level, including working gas,~~ technical, booked and available storage capacity (firm and interruptible where applicable);
  - b. ~~daily~~ aggregated inflow and outflows ~~and historical utilization rates;~~
  - c. user-friendly instruments for calculating charges for a specific service (e.g. tariff calculator) and for verifying online the level of available capacity, ~~including net and available firm and interruptible capacities;~~
  - d. maps indicating the location of their storage facilities and the connecting points of the storage facilities to the relevant network;
  - e. the rules (if any) of transfer of storage capacity and injection and withdrawal capacity in case of customer switch.
- 6.6. Information described in § 6.43 and § 6.54 shall be made available and updated whenever changed as relevant on ~~a real time,~~ daily, monthly, quarterly or annual basis **[To keep nominations whole (§ 3.4) SSOs may be required to take 'buy' or 'sell' action in the market place – publication of real-time information would provide storage users with knowledge of the need for SSOs to participate in the market. This would seriously disadvantage the SSOs 'allocate whole' service and distort the market unless real-time information is made available for all sources of flexibility (offshore and onshore production facilities)] .**
- 6.7. The SSO shall publish at least once a year, by a predetermined deadline, all planned maintenance periods that might affect storage users' rights from storage contracts and the corresponding operational information with adequate advance notice. Where unplanned disruptions in access to the storage facility occur, the SSO shall ensure **actual relevant system storage** users are notified of that disruption as soon as possible. The SSO shall maintain and make available to the national regulatory authorities ~~and/or to those affected by any disruption~~ upon request, **a daily log of information on** the actual maintenance and disruptions that have occurred.
- 6.8. At least the provisions of § 6.5.a, ~~b,~~ and d shall apply also to any storage capacity not required to provide TPA according to Article 19 of the Gas Directive or any other storage facility connected to a transmission system and for which there is no TPA..
- 6.9. Storage users shall not be separately charged for information requests and transactions associated with their contracts according to standard rules and

procedures (e.g. nominations). Expenses for requests not linked to general SSO's roles and responsibilities and transparency requirements can be separately charged.

**6.10. Where requested by a relevant regulatory authority, SSOs shall be required to provide information to allow the national regulatory authority to assess storage user's compliance with PSOs.**

~~6.10.6.11. SSOs shall comply with these provision by 1 April 2005; if SSOs have problems in implementing measures envisaged under §6, in particular with regard to IT systems, they shall provide an explanation to the relevant national authority setting out the problems in implementing by this deadline and present a concrete action plan for the implementation taking into account, if applicable, the size of the company. [Implementation timescales are already referred to in § 3.8]~~

## **7. Tariff structure and derivation**

7.1. Where regulated, tariffs structure of the SSO should:

- a. reflect efficiently incurred costs of access to storage facilities including fair return on investment, both in the case of direct access to a specific storage and access to virtual storages;
- b. reflect the geological nature of storages;
- c. avoid cross subsidies between storage users;
- d. promote efficient commercialisation and use of storage;
- e. promote adequate and efficient investments according to users' needs, feasibility and technical constraints;
- f. be clear, transparent and reviewed on a regular basis taking into account developments in the market;
- g. where appropriate, international benchmarking of tariffs may be taken into account and applied in non discriminatory manner.

7.2. Where negotiated, SSOs shall not adopt any charging principles and/or tariff structures that would restrict market liquidity of storage capacity, create undue barriers to market for new entrants, cross-subsidies between system users or hamper system enhancements and integrity. Pursuant to Article 19 of the Gas Directive, in case of disputes, the relevant regulatory authority shall determine appropriate arrangements. The SSO shall maintain records to enable the regulator to determine costs of provision and prices already levied on other users of that facility for the similar services. In nTPA regimes, charges shall:

- a. be non-discriminatory; prices should be the same for any storage user for the same service contracted for at the same time and under the same conditions; they should only vary subject to adaptations/changes on the grounds of varying circumstances;
- b. promote efficiency and facilitate competition in the use of storage services;
- c. provide for appropriate incentives on new investments according to users' needs, feasibility and technical constraints;
- d. negotiations should happen in a time frame compatible with commercial needs;



- 7.3. In rTPA or nTPA regimes, capacity auctions are an efficient and acceptable market based method for setting storage tariffs and allocating storage services where compliant with the provision laid down in Directive 2003/55/EC *[This is required to incorporate auction based mechanisms as an appropriate means of setting tariffs and allocating storage services]*.

## 8. Storage penalties

- 8.1. Storage penalties may be established to ensure that the SSOs and the storage users respect their contractual obligations.

~~8.2.a. Storage penalties may apply to:~~ SSOs may be exposed to storage penalties (such as compensation payments to the storage users) in the event that the SSO fails to fulfil contractual obligations, as set out in the storage code/contract.

b. Storage users may be exposed to storage penalties (such as overrun and scheduling charges) as an incentive to ensure they nominate and use storage capacity consistently with the capacity rights they have procured either on the primary or secondary storage market.

~~a. SSOs for compensation to be paid to the storage users in the event that the SSO fails to fulfil contractual obligations, as set out in the storage code/contract; and/or to~~

~~b. storage users for providing effective incentive to ensure that they nominate and use storage capacity consistently with the capacity rights they have procured either on the primary or secondary market.~~

~~8.3.8.2.~~ Storage penalties shall:

- a. be designed in a non discriminatory and transparent manner, based on objective criteria;
- b. be aimed at providing effective incentive on storage users to ensure the safe functioning of storages ~~and where necessary, to ensure that PSOs are met~~ *[The obligation to provide information to the regulator to ensure PSOs are met should be the limit of the SSOs obligations]*;
- c. not hamper the entry of new participants into the market;
- d. ensure that, in case of penalties collected by the SSO, the SSO remains broadly cost neutral; penalties over and above the actual efficiently incurred costs, shall be redistributed to the storage users on a non discriminatory basis, any costs that cannot be targeted should be allocated back to users in a non discriminatory manner.

~~8.4.8.3.~~ When needed, national regulatory authorities should ensure compatibility of storage penalties with transmission balancing regimes.

## 9. Market based mechanisms such as secondary market

- 9.1. The SSO shall allow and facilitate bundled and unbundled services to be freely tradable between registered shippers in a secondary market without any undue restrictions and develop standardised contracts and procedures on the primary **storage** market to facilitate secondary trade and recognise the transfer of rights where notified by storage users. SSO must allow the new owner to aggregate such storage capacity with its existing storage capacity operationally.
- 9.2. Where requested and paid for by storage users, SSOs shall provide cost-reflective services (such as an electronic platform or bulletin board) to facilitate secondary storage capacity trading and associated transfer of storage capacity rights between storage users.

## 10. Cooperation with TSOs

- 10.1. SSOs and TSOs should co-operate in order to ensure interoperability between both systems, e.g.:
  - a. provide services ~~consistent~~**compatible** with those offered by the adjacent TSO ~~and required~~ so as to ensure the efficient use of the interconnected transmission system;
  - b. render operational procedures, such as nomination, compatible with those of the adjacent TSOs;
  - c. ensure re-nomination procedures match market participants requirements **subject to technical and economical constraints**;
  - d. ensure consistency in matching relevant storage arrangements with the balancing requirements of the adjacent transmission system.

### **Annex: Definitions**

1. Available storage capacity means the part of the technical storage capacity that is not contracted or allocated to production and transport and is still available to the storage users at that moment.
2. Cushion gas means the minimum technical volume of gas intended as permanent inventory in a storage reservoir to maintain adequate pressure and deliverability rates throughout the withdrawal season.
3. Deliverability is the amount of gas that can be delivered (withdrawn) from a storage facility per time unit. The deliverability of a given storage facility is variable, and depends on factors such as the amount of gas in the reservoir at any particular time, the pressure within the reservoir, compression capability available to the reservoir, the configuration and capabilities of surface facilities associated with the reservoir, and other factors. In general, a facility's deliverability rate varies directly with the total amount of gas in the reservoir: it is at its highest when the reservoir is most full and declines as working gas is withdrawn.
4. Final customer means customers purchasing natural gas for their own use (Gas Directive)
5. Firm capacity is storage capacity contractually guaranteed as uninterruptible by the SSO;
6. Firm services are services offered by the SSO in relation to firm capacity;
7. Flexibility is the availability of gas and/or capacity (transmission, storage, LNG capacity) needed to: adapt supply to foreseeable volume variations in demand and to adjust the erratic fluctuations of demand; exploit market opportunities with the market opening to competition, i.e. using different combinations of flexibility tools in order to achieve cost advantages or enjoy new market businesses; comply with public service obligations and strategic objectives.
8. Injectability is the complement of the deliverability or withdrawal rate. It is the amount of gas that can be injected into a storage facility per time unit. The injection capacity of a storage facility is also variable, and is dependent on factors comparable to those that determine deliverability. By contrast, the injection rate varies inversely with the total amount of gas in storage: it is at its lowest when the reservoir is most full and increases as working gas is withdrawn.
9. Interruptible services are services offered by the SSO, in relation to interruptible capacity;
10. Interruptible storage capacity is storage capacity that can be interrupted by the transmission system operator according to the conditions stipulated in the storage contract/storage code. The contract/code may specify the permitted duration, frequency and timing of the interruptions. It may also specify the previous notice required and possibly a fee related to the duration of the interruptions.
11. National regulatory authorities are the bodies as defined by Article 25(1) of the Gas Directive.

12. Nomination means the prior reporting by the storage user to the SSO of the actual flow that he wishes to inject into or withdraw from the system.
13. Primary storage market means the market of the storage capacity ~~directly traded offered~~ by the SSO **[SSO's do not trade storage capacity, only offer and allocate capacity]**.
14. PSO means Public Services Obligations.
15. Re-nomination means the reporting of a corrected **or updated** nomination.
16. SBU means Standard Bundled Unit. Storage capacity may be sold in SBUs, which gives customers the right to withdraw, inject and hold gas in store, with determined technical ratios. SBUs should reflect the technical characteristics of the storage facility or a group of storage facilities (aquifer, peak-shaving...).
17. Secondary **storage** market means the market of the storage capacity traded **following capacity allocation** ~~otherwise than~~ on the primary **storage** market.
18. Storage capacity is the space (expressed in normal cubic meters or energy) and flow (expressed in normal cubic meters or energy per time unit) to which the storage user is entitled in accordance with the provisions of the storage contract. Storage capacity refers to space, injectability and deliverability. All of ~~them which~~ can be firm or interruptible.
19. Storage facility means a facility used for the stocking of natural gas and owned and/or operated by a natural gas undertaking, including the part of LNG facilities used for storage but excluding the portion used for production operations, and excluding facilities reserved exclusively for transmission system operators in carrying out their functions (Gas Directive).
20. Storage penalty is the additional charge that storage system operators/storage users may have to pay after not respecting their contractual obligations.
21. Storage system operator means a natural or legal person who carries out the function of storage and is responsible for operating a storage facility.
22. Storage user means **an actual or potential SSO** customer, ~~of a SSO~~ which would sign the relevant storage code or enter into storage contracts with SSOs for storing gas. Storage users may include, but are not limited, to final customers, supply undertakings, wholesale customers, traders and TSOs, to the extent that storage is necessary for the TSOs and DSOs to carry out their functions.
23. System user means any natural or legal persons supplying to, or being supplied by, the system (Gas Directive).
24. Technical storage capacity is the maximum storage capacity that the SSO can offer to storage users, on firm basis, taking into account the system integrity and the operational requirements of the storage infrastructures. It is determined by the physical characteristics of the reservoir and installed equipment.
25. TPA services means Third Party Access Services. TPA to storage is either regulated (rTPA) or negotiated (nTPA).

26. TSO means transmission system operator.
27. Unbundled storage product means that space, injectability, deliverability can be **allocated** / traded separately.
28. Unused Storage Capacity means that part of the Available Storage Capacity, plus that part of the Contracted Storage Capacity that has not been nominated for use.
29. Virtual storage means a storage service sold in the form of traditional storage product, but not directly linked to a physical storage. A supplier may also use both physical storage and other flexibility tools as well as spot and other supplies and capacity margins resulting from a pool of customers in order to offer virtual storage.
30. Withdrawal rate: see Deliverability.

~~31. Working gas means the volume of gas in the reservoir above the level of cushion gas that can be withdrawn and re-injected. [not relevant]~~