



Gas Storage Europe

# **How to enhance Security of Supply: The role of Natural Gas Storage in the internal gas market**

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GSE President

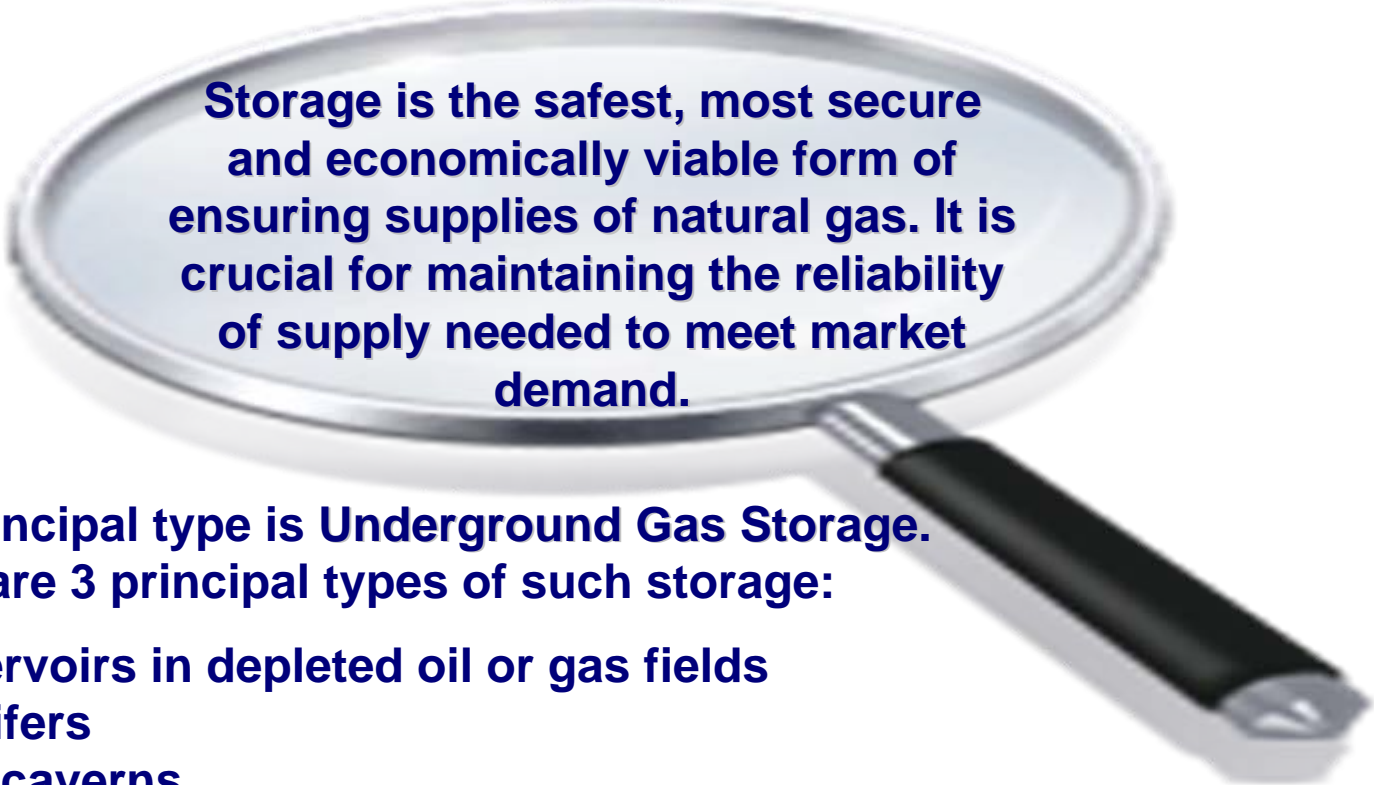
**4<sup>th</sup> Annual Sustainable Development Summit Kazakhstan**

**Astana, 10 september 2008**

# Agenda

- 1. What is storage**
- 2. The role of storage**
- 3. Enhancing storage development**
- 4. GSE main messages**
- 5. GSE initiatives**

# 1. What is storage?

A large, silver magnifying glass with a black handle is positioned over the text. The lens of the magnifying glass is centered over the main definition of storage.

**Storage is the safest, most secure and economically viable form of ensuring supplies of natural gas. It is crucial for maintaining the reliability of supply needed to meet market demand.**

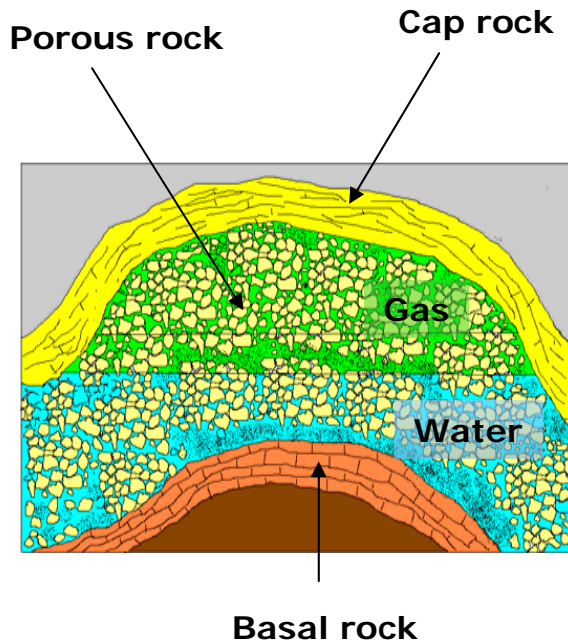
**The principal type is Underground Gas Storage. There are 3 principal types of such storage:**

- ✓ **reservoirs in depleted oil or gas fields**
- ✓ **aquifers**
- ✓ **salt caverns**

**Additionally, Above-ground Storage facilities can be built (i.e. LNG peak shavers). These differ from the Underground Storage in that they have significantly smaller capacity although higher deliverability rates.**

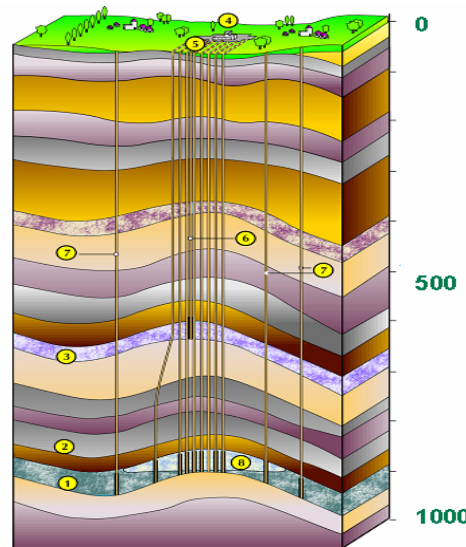
# Underground storage

## Reservoir



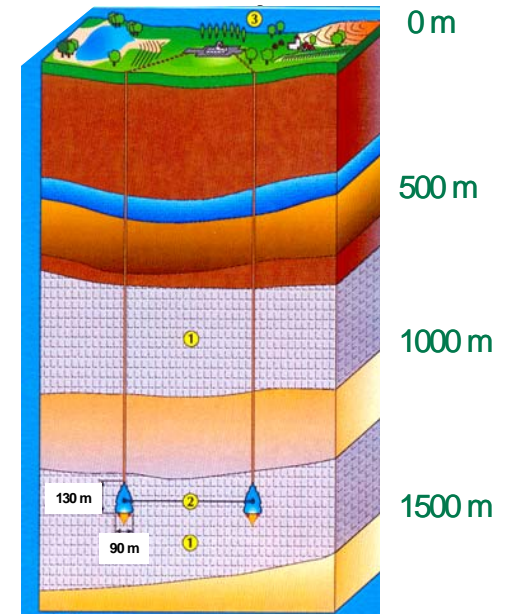
Reservoirs are the most commonly used underground storage sites because of their availability.

## Aquifer



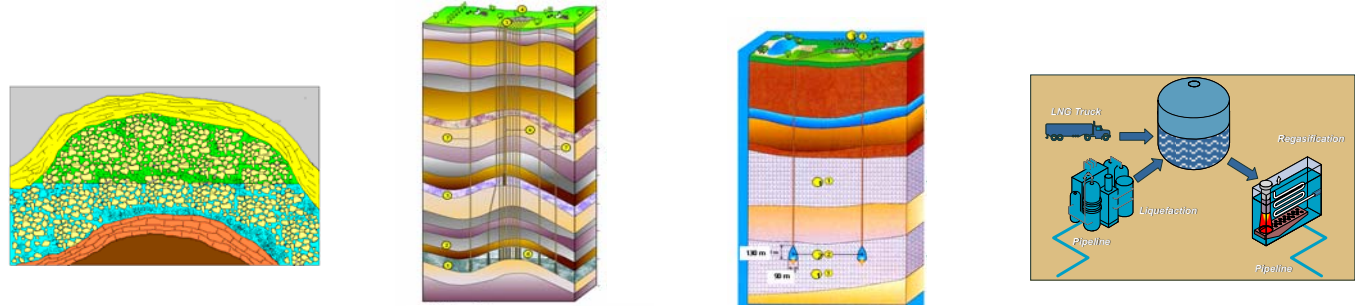
Aquifers are used in some areas to store natural gas if the formation is overlain by an impermeable layer.









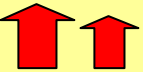

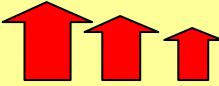

## Salt cavern



Salt caverns are “artificial” structures created in some underground salt domes.

# Synthesis



	Reservoir	Aquifer	Salt cavity	LNG peak shaver
<i>Working Gas</i>				
<i>Cushion Gas</i>				
<i>Deliverability</i>				



High

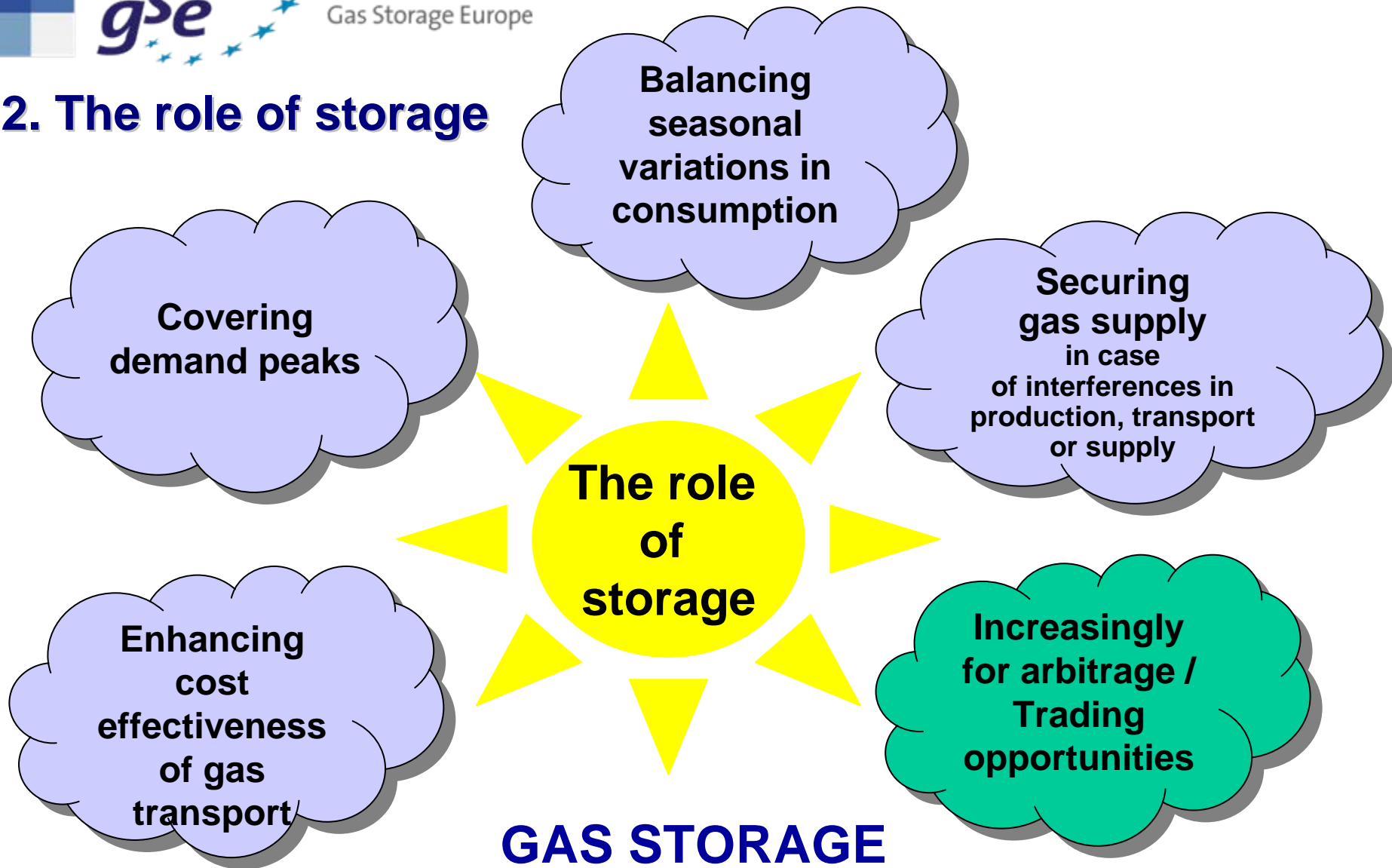


Medium



Low

## 2. The role of storage



**is an important contributor to the  
SECURITY OF SUPPLY!**

## Use of storage

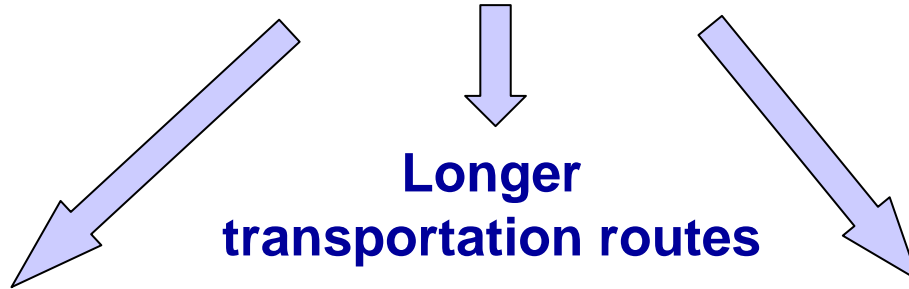
### Base Load

- Cover seasonal demand
- Facilities capable of holding enough gas to meet long-term demand
- Lower deliverability rate
- Turn-over rate of 1 year
- Types of storage:
  - Depleted fields
  - Aquifers

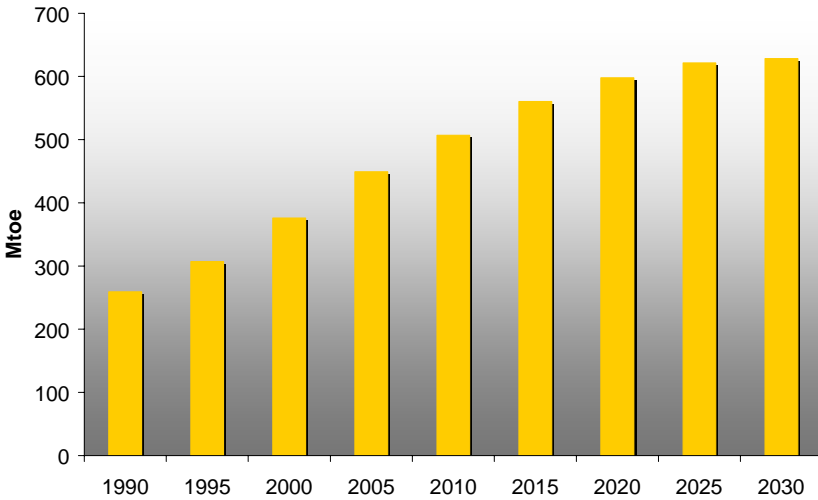
### Peak Load

- Meet short-term demand increase
- Smaller facilities
- Higher deliverability and injectability rates
- Turn-over rate of less than 1 year
- Types of storage:
  - Salt caverns
  - LNG peak-shaving

# Why storage?

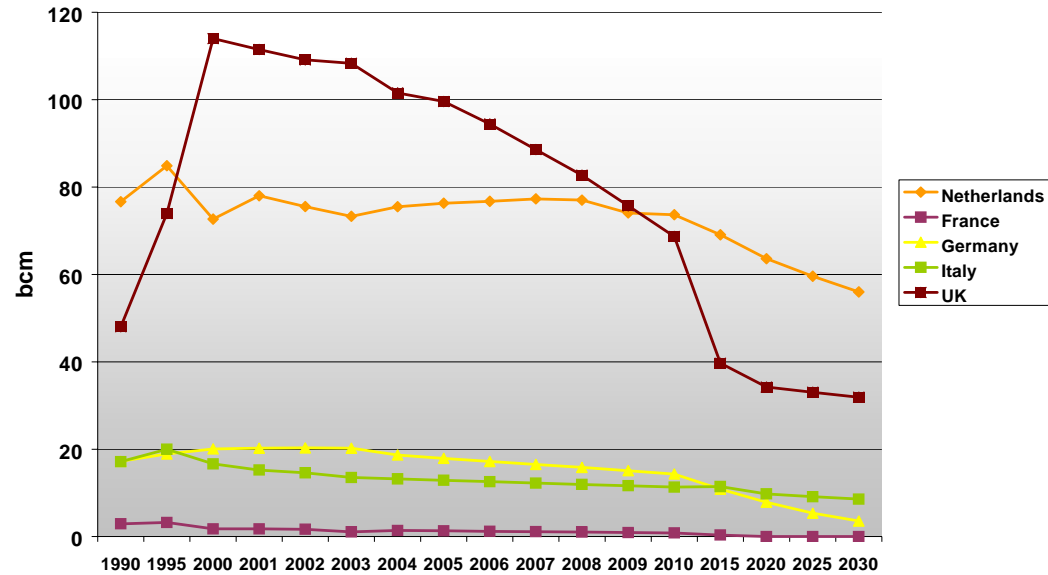


## Increasing gas demand in EU-27



Source: European Commission, 2004.

## Decreasing EU gas production



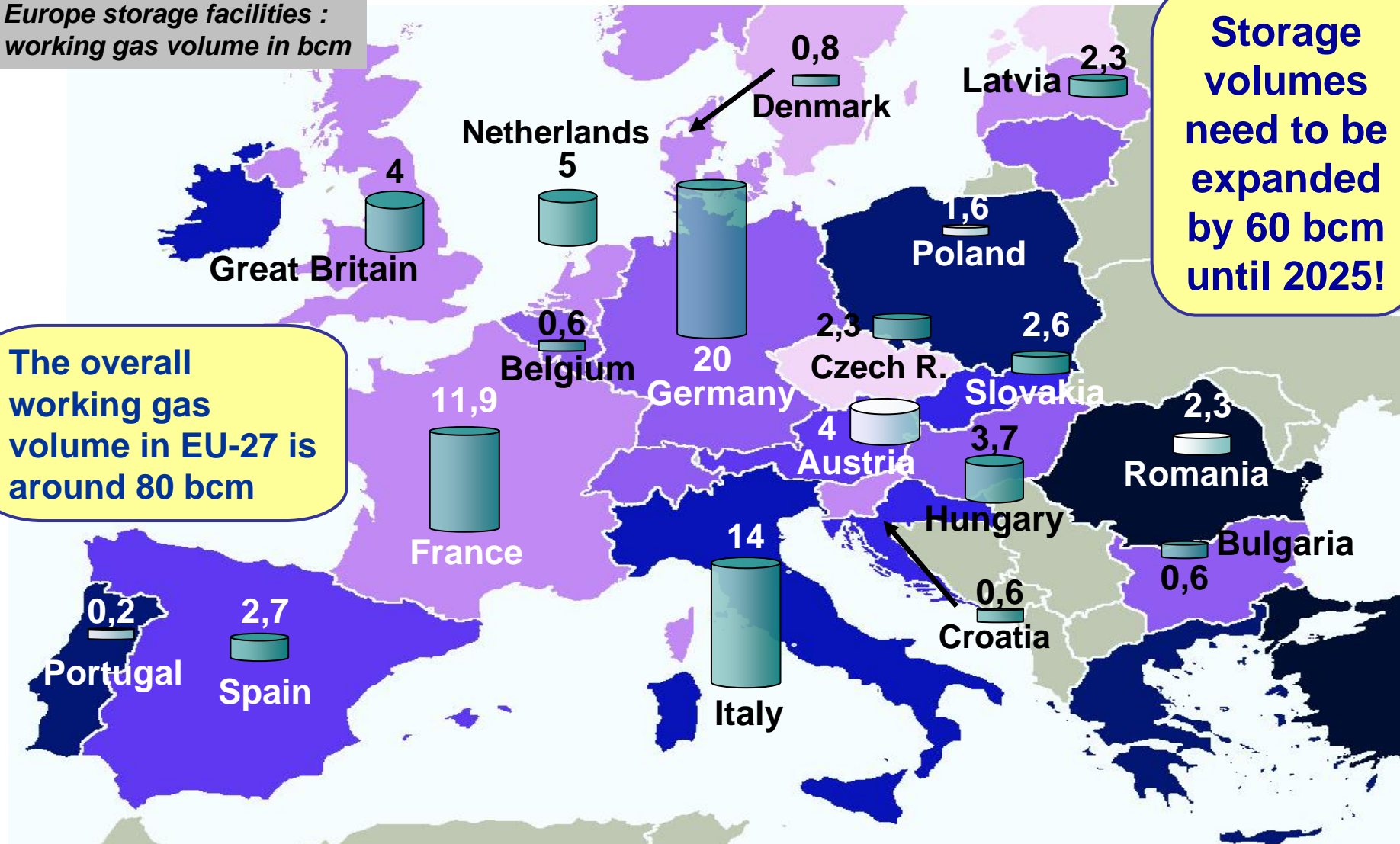
Source: Global Insight, 2004

# Storage volumes – present

Europe storage facilities :  
working gas volume in bcm

Storage volumes need to be expanded by 60 bcm until 2025!

The overall working gas volume in EU-27 is around 80 bcm



## “ever-changing” role of storage

### Limitations to flexibility tools competing with storage

#### → Swing on long-term contracts

- Producers less inclined to negotiate long-term contracts with high swing level

#### → Flexibility gas production

- Decrease due to expected EU production decline

#### → Gas market hub

- Limitation in terms of availability / capacity

#### → Customer interruptible contracts

- Commercial limits

#### → Linepack / LNG "peak-shaving"

- Technical limits (capacity)

### 3. Enhancing storage development

## Investment is Key!

### Investment specificities for underground gas storage

- ❖ Long lead-time between investment decision and the start of operation (also including permitting requirements)
- ❖ Risk associated with exploration (underground), technical and realization tasks
- ❖ High capital immobilisations
- ❖ Long operational lives

The current estimates indicate that Europe will need an additional **60 bcm** of storage capacity by 2025. The GSE Investment Database shows that **43 bcm** of storage volumes are planned to be developed by 2015.

...provided that proper investment climate is in place....

# Preconditions for development of storage market

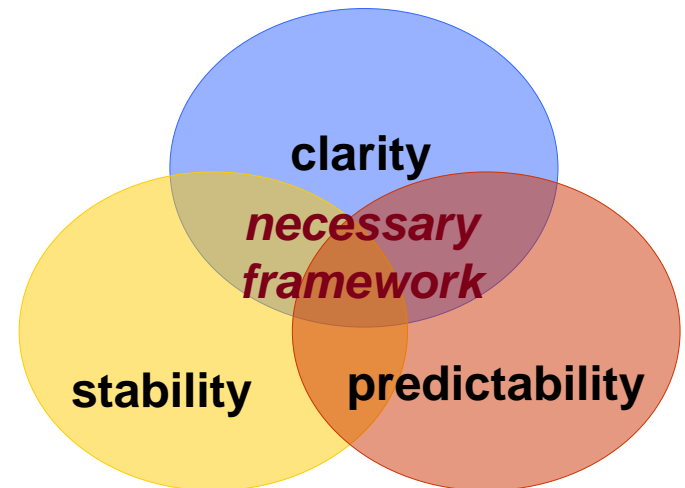
## SATISFY USERS' REQUESTS FOR:

- *Non discriminatory and transparent access*

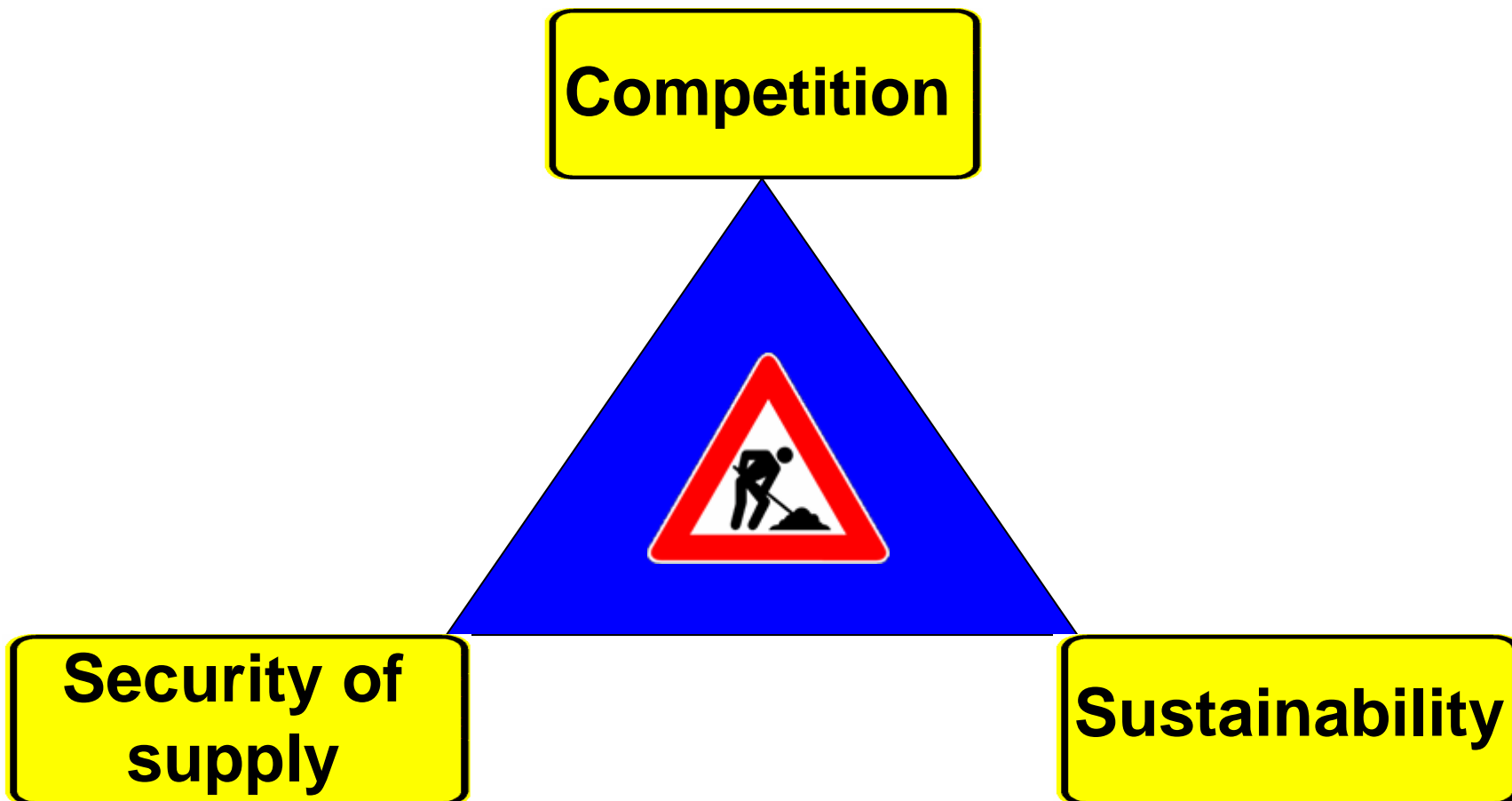
## SSOs NEED:

- *Commercial remuneration*

## INSTITUTIONS MUST PROVIDE:

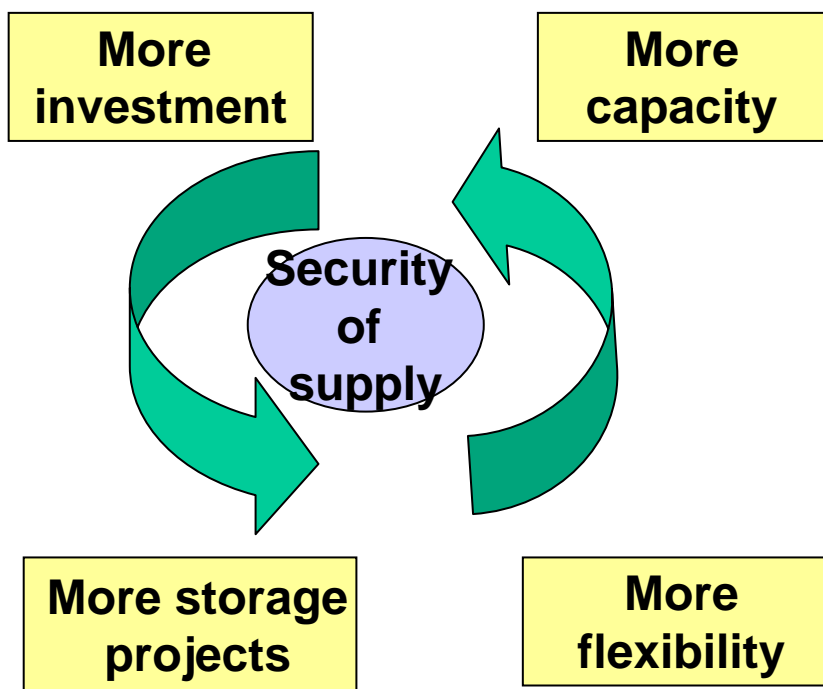


## The „trilemma“ of the regulatory approach

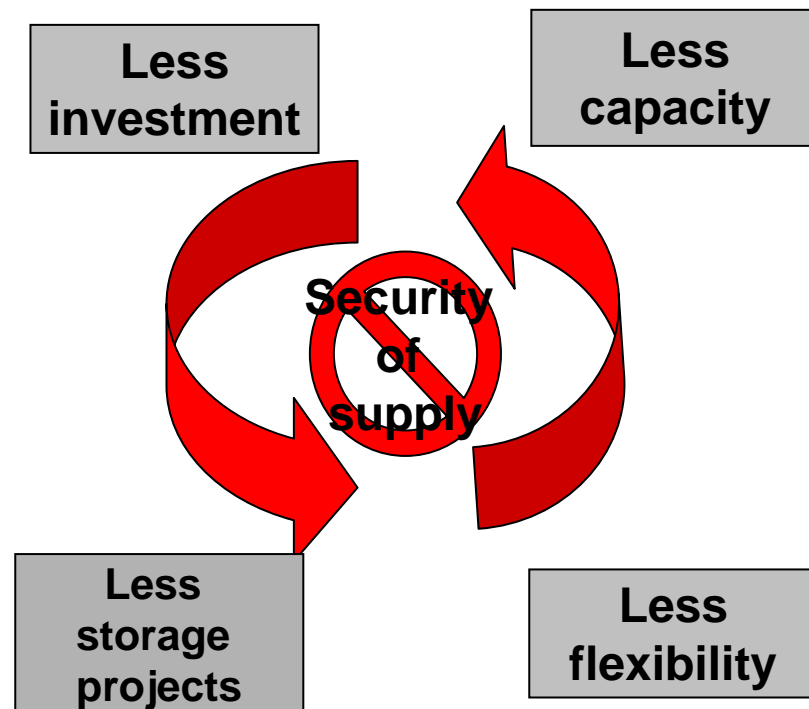


## Third Energy Package: How to get it right?

Proper & incentive-driven  
regulatory framework



Excessive regulation



**Transparency and Non-discriminatory treatment is also ensured – as required by Guidelines for Good Practice for Storage System Operators (GGPSSO)**



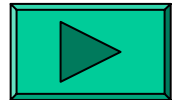
The primary objective of initiatives undertaken by GSE is to enable storage activities to be in line with market expectations and to promote transparency

## Recent Initiatives:

- Aggregated Gas Storage Inventory



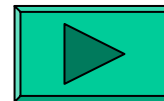
AGGREGATED GAS STORAGE INVENTORY



- Storage Investment Database



gse  
Gas Storage Europe  
STORAGE INVESTMENT DATABASE



- GSE Position paper on strategic storage
- GSE observations on GGPSSO implementation
- Nomination of managers in charge of the relationships with:

✓ *European institutions (ITRE Commission, DG TREN...)*

✓ *Customer associations (EFET...)*

✓ *Regulators (ERGEG)*

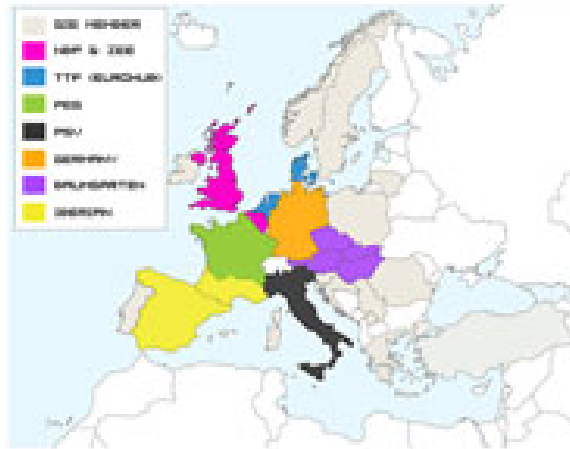
## 5. GSE Initiatives

### Aggregated Gas Storage Inventory



AGGREGATED GAS STORAGE INVENTORY

WEEKLY DATA      HISTORICAL DATA      INDIVIDUAL DATA



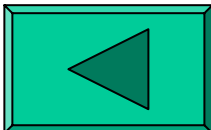
GIE is pleased that its members have agreed on a voluntary basis to publish storage inventory as per Regional Energy Market project areas. This initiative is beyond that required by the GPPSO and Gas Directive and will help provide the information the market needs to operate efficiently and effectively whilst protecting commercially sensitive information.

This information is provided in an aggregated format to guarantee that commercially sensitive information is not disclosed. GIE are therefore unable to further comment on any specific member, country or area.

For non-data related information, please contact the GIE Secretariat at [secret@ie.eu.com](mailto:secret@ie.eu.com)

Stocklevel status on Monday 11/02/2008 - 5:59am GMT+1

Regional Initiative Area	PREVIOUS WEEK		CURRENT WEEK		
	Stock Level Mon 04/02 - 5:59	Accuracy Level % Mon 04/02 - 5:59	Stock Level Mon 11/02 - 5:59	Accuracy Level % Mon 11/02 - 5:59	% Full Mon 11/02 - 5:59
Baumgarten	5956 mcm	100%	5906 mcm	78%	55%
Germany	7086 mcm	100%	7764 mcm	100%	65%
Iberian	3933 mcm	100%	3517 mcm	100%	63%
BBPAZEE	2512 mcm	100%	2896 mcm	94%	59%
PEG	4568 mcm	100%	4280 mcm	100%	49%
PSV	4806 mcm	100%	4411 mcm	100%	50%
TTT (Eurohub)	886 mcm	100%	815 mcm	100%	59%

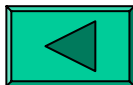


## 5. GSE Initiatives

### ➤ Storage Investment Database



							TOTAL STORAGE CAPACITY ADDITIONS			
							45773			
Country	Company	Name of facility	Type of facility	Investment	Status	Expected Capacity (Mm WG)	Expected date	Last Update date	Source	
AUSTRIA	OMV Gas	Schönkirchen Tief	Reservoir	New facility	Planned	1000	by 2015	5 July 2007	GSE file	
AUSTRIA	BAG/Wingas/Casparm E	Haidbach	Reservoir	New facility	Live	0	June 2007		GSE file	
AUSTRIA	BAG/Wingas/Casparm E	Haidbach	Reservoir	New facility	Under construction	1200	by 2013	now/ST	GSE file	
BELGIUM	Fluvis	Loenhout	Aquifer	Expansion	Under construction	100	by 2010	5 July 2007	GSE file	
BELGIUM	Fluvis	Poederlee	Aquifer	New facility	Planned	0	by 2015	now/ST	GSE file	
BULGARIA	Bulgariangas	Chiren	Reservoir	Expansion	Planned	450	by 2010	now/ST	GSE file	
CZECH REPUBLIC	RWE Gas Storage	Not specified		Expansion (various sites)	Planned	770	by 2013	now/ST	GSE file	
DENMARK	Dong Storage	Stenlille	Aquifer	Expansion	Under construction	90	by 2010	5 July 2007	GSE file	
FRANCE	Gas de France	Cairé La Pommeroye	Aquifer	Expansion	Planned	200	by 2013	5 July 2007	GSE file	
FRANCE	Gas de France	Etrech-Mansouret	Salt cavity	Expansion	Planned	200	by 2013	5 July 2007	GSE file	
FRANCE	Gas de France	Hauterive	Salt cavity	New facility	Planned	100	by 2013	5 July 2007	GSE file	
FRANCE	Gas de France	Ile de France Nord-Cormais	Aquifer	Expansion	Planned	200	by 2013	5 July 2007	GSE file	
FRANCE	Gas de France	Alsace Sud	Salt Cavity	New facility	Planned	100	by 2015	now/ST	GSE file	
FRANCE	Gas de France	Trois Fontaines	Reservoir	New facility	Committed	80	by 2010	5 July 2007	GSE file	
FRANCE	TGF	Saules-Louagnel	Aquifer	Expansion	Planned	240	by 2015	5 July 2007	GSE file	



**Thank you for your attention !**

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