



# The role of Storage in the future of the EU energy systems

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**High-Level Roundtable: The Strategic Contribution of Energy Storage to Energy Security and the Internal Energy Market  
Brussels, 19 May 2015**

# The EU Energy Sector trends and challenges

(from the "Bridge to 2025" Conclusions Paper – September 2014)

**Moving towards a  
Low-Carbon Society**

**Increased penetration of  
non-programmable  
Renewable Sources**

**Adequacy and  
greater need for Flexibility  
of the Electricity System**

**Flexibility and  
Adequacy Challenges  
in Electricity Markets**

**Uncertainty over  
Future Gas Demand**

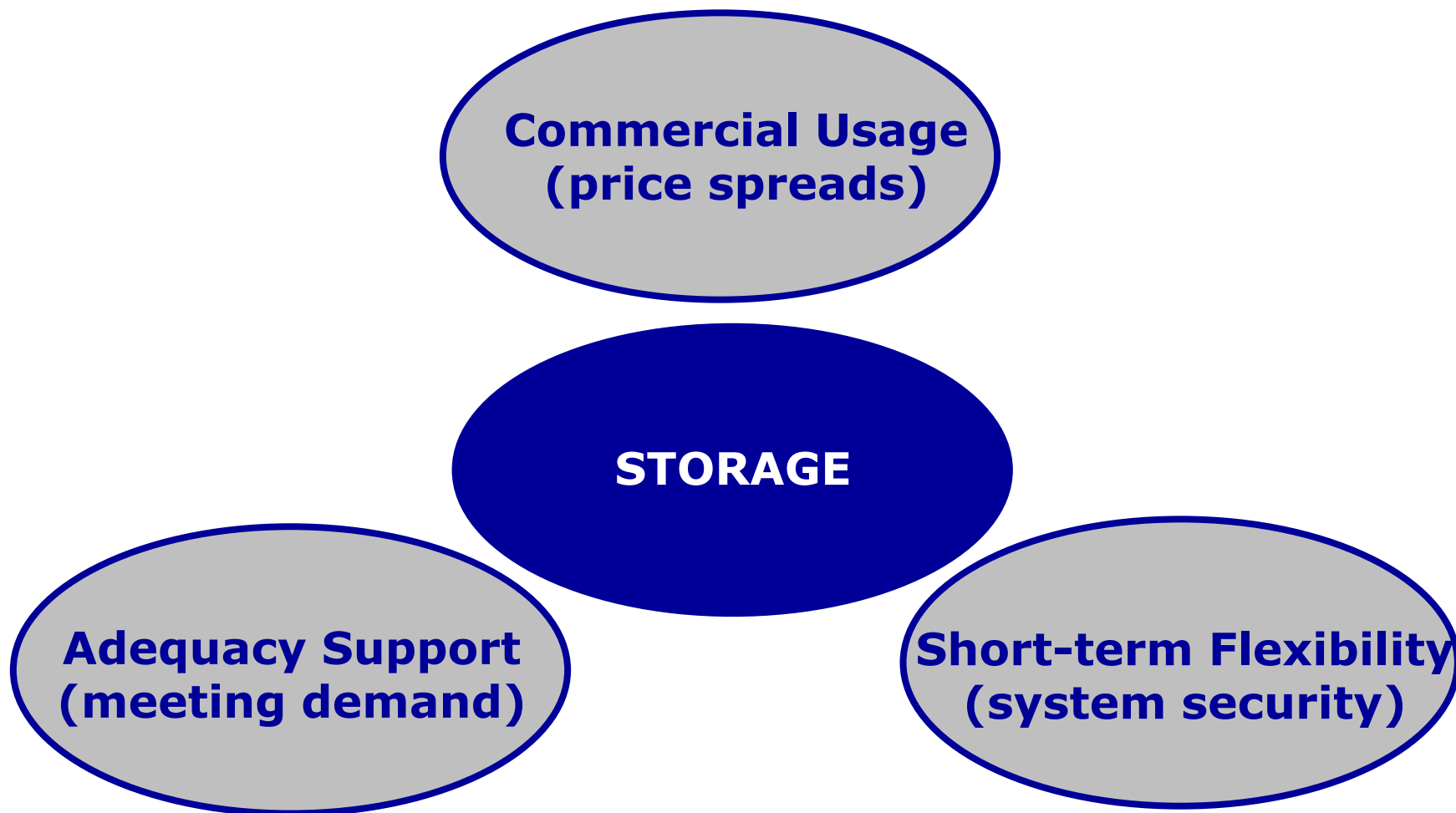
**New**

**STORAGE CAN ASSIST IN  
MEETING THESE CHALLENGES**

**gas used for Flexible  
Power Generation**

**More Liquid, Flexible  
and Integrated Gas  
Markets**

# The Role of Storage: main uses



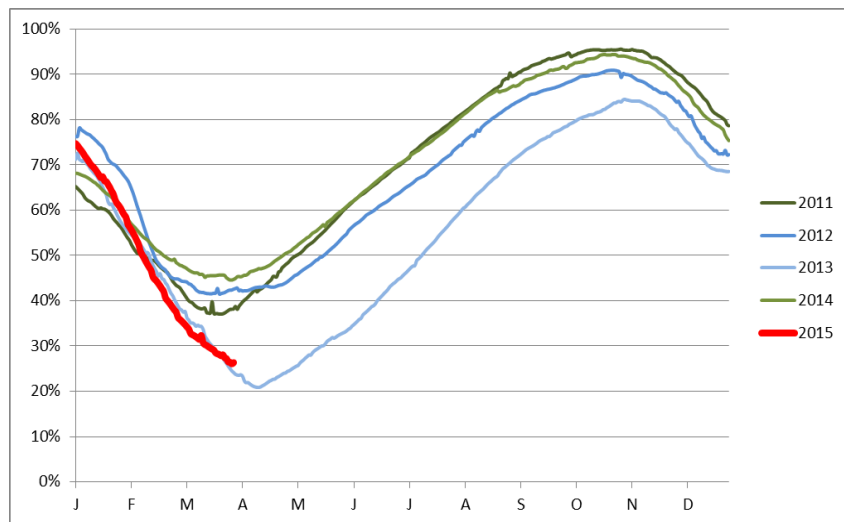
# The Role of Storage: Commercial Usage

- Depends on price spreads and demand/supply variations over time:
  - For gas: Summer/Winter
  - For electricity: Peak/Off-Peak
- ... and on the level of storage efficiency  
(e.g. typically 70% pump-storage hydro)
- It may help accommodate RES generation at time of low demand

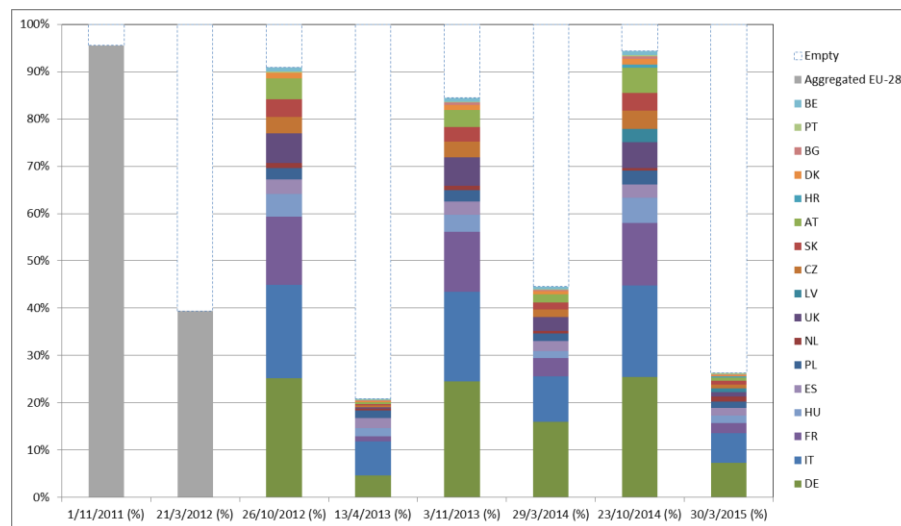
# The Role of Storage: Adequacy Support

- Meeting peak demand, avoiding the need of extra generation and supply (or transmission)
  - Mostly for gas: meeting winter peak

## Actual gas storage levels



## Storage levels at the start and end of the heating season



Sources: GSE AGSI+ database

# The Role of Storage: Short-term Flexibility

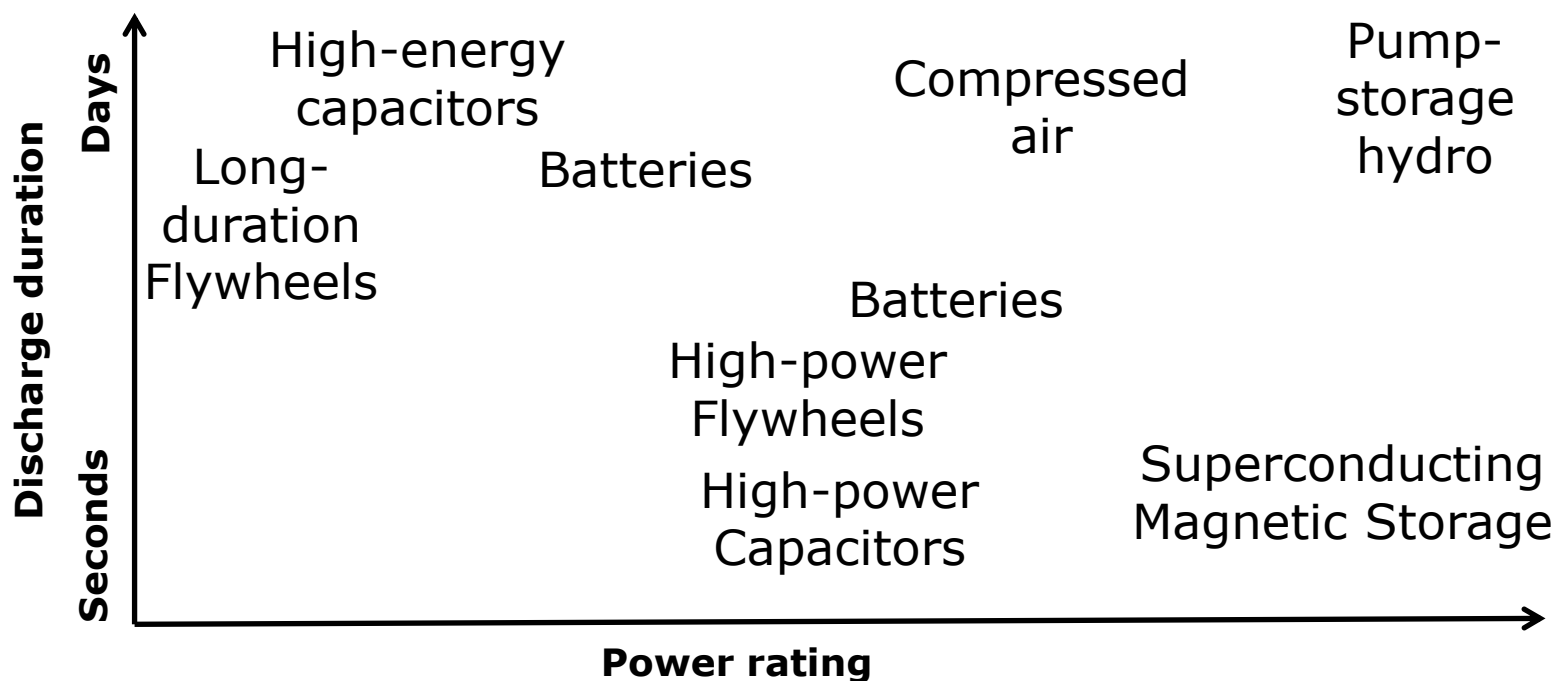
- More important in electricity (where the system needs to be kept in balance at all times):
  - Requirement of more flexibility in real time to accommodate sudden variations in RES output
  - Rests on the ability of storage to input into the network
  - Not the only source: e.g. demand response

# The Regulatory treatment of Storage

- Different uses of storage may call for different governance requirements and regulatory treatments
- ... depending on the ability to create competition among storage operators (e.g. in the case of UGS)
- ... or with other resources providing similar services (e.g. from electricity generation or demand response)
- Who can own and operate a storage facility?
- Should new technologies, characterised by high capital intensity and long-deployment times, be supported by incentive schemes?
- The business case for storage should take the value and revenues from all types of uses

# Electricity Storage

- Encompassing a broad range of technologies with different capabilities
  - beyond the traditional storage in the form of kinetic energy in pump-storage hydro





# Electricity Storage

- Encompassing a broad range of technologies
  - beyond the traditional storage in the form of kinetic energy in pump-storage hydro
  - “Power to gas” potentials for storing electricity as gas
- A definition of electricity storage does not yet exist
- Various procurement and remuneration regimes for balancing and (other) ancillary services across Europe:
  - mandatory provision
  - bilateral contracts
  - tendering
  - use of the spot market

# Electricity Storage: ancillary services

**Examples of procurement regimes for ancillary services  
which can be provided by electricity storage**

<b>Ancillary Service</b>	<b>Mandatory Provision</b>	<b>Bilateral Contracts</b>	<b>Tendering</b>	<b>Spot Market</b>
Primary FC	ES	FR	DE, UK, SE	
Secondary FC		FR	DE	ES
Voltage Control	DE, ES, FR, SE, UK	DE, FR	ES, UK	
Black-start		X		
Congestion relief		X	X	

*Information from: FSR THINK Report Electricity Storage: How to Facilitate its Deployment and Operation in the EU, Table 5*

## Electricity Storage and ancillary services

- *"The difficulty for external investors, especially for those not being incumbent generators, to know the value of storage for providing the ancillary services could partially be due to the lack of data and knowledge about the ancillary services procurement and remuneration. This lack of data and knowledge is sometimes related to the adoption of bilateral contracts not accessible for a third party"*

*(FSR THINK Report Electricity Storage: How to Facilitate its Deployment and Operation in the EU, page 38)*

- Greater **harmonisation and transparency** of ancillary services procurement across Europe!
- Rapid **adoption and implementation** of the **Electricity Balancing Network Code** would contribute to promote flexible technologies, including storage!

## Gas Storage: Gas Target Model (update)

- Declining gas demand in the EU reduces the need of gas storage to meet winter peak demand
- Winter-summer price differential
  - down from €7/MWh in 2010 to €3/MWh in 2013
  - but then up again (€5/MWh) following the crises in Ukraine
- Proposed market-compatible measures to improve the use of gas storage to enhance Security of Supply:
  - unbundling of storage products to facilitate the efficient use of storage for different purposes
  - ensuring that system balancing prices are not capped and are allowed to rise to the value of lost load
  - ensuring that the methodology for setting entry-exit tariffs recognises the difference between the network costs resulting from injection into and withdrawal from storage, compared with the generality of entry and exit between zones

**Thank you  
for your attention**

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