Energy Storage
From Strategic Reserves to a Strategy Approach

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Major energy challenges in Europe

- Import Dependency
- High Energy Prices
- Decarbonisation
- Technology mix

How to address energy challenges in Europe

- Complete the internal market and place consumers into focus
- Improve EE- attract investments, behaviour change
- Increase RES – lower technology costs, market integration measures, reform support schemes
- Make use of available energy resources, develop synergies between RES and fossil fuels (e.g. Power to Gas)
- Improve and develop infrastructure – interconnections, smart grids
- Diversify energy supplies and International cooperation

  (e.g. Energy Community, Eastern Partnership, Inogate)

- **Act on Technologies – Regulations – Financing - Cooperation**

2030 targets

- Greenhouse gas emissions reduction of 40%
- EU level target of at least 27% share of renewable energy
- Energy Efficiency improvement of 27%

By

- Greenhouse gas reduction target at EU level, shared equitably among the Member States.
- A reform of the Emissions Trading System.
- A new European governance process for energy and climate policies based on Member State plans for competitive, secure and sustainable energy.

While energy efficiency will continue to play a significant role in delivering the Union's climate and energy objectives.

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Research and innovation challenges to support EU energy system post 2020

- *Looking at the whole energy system*
- *Builds up on the 2008 SET Plan*
- *Bridging research and innovation with energy policy*
- *Making use of existing and increased financial resources*
- *Keep options open*
- *Connect endogenous resources*
- *Adding value at the EU level*
- *Integrated Roadmap & Action Plan*
- *Stronger link with energy policy and financing*

The EU Energy Security Strategy

Main messages:

Energy security is inseparable from 2030 climate and energy policy framework.

We need to act now to ensure supplies this winter and in the medium-long term:

Moderate energy demand	Increase sustainable energy production
Emergency and security mechanisms	Including our neighbours
More integrated energy market	Intensify our diversification efforts
Accelerate interconnections	Full use of EU financial instruments
Compliance of infrastructure projects	Coordination of national energy policies
Coherent external energy policy	Synergy with foreign policy instruments

Energy system investment needs

Total investment needs in the electricity and gas sector between 2010-20: over 1 trillion €

- Power generation: ~ 500 bn
  - RES: ~ 310-370 bn
- Transmission and distribution: ~ 600 bn
  - Distribution: ~ 400 bn
  - Transmission: ~ 200 bn

NB: approximative figures, mainly from DG ENER calculations based on data from PRIMES, ENTSO-E, KEMA, ECOFYS etc.

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Storage of Primary Energy Resources

Strategic energy reserves – security of supply

- regulated strategic reserves of over 90 days of oil import
- On average 51 days of reserves of natural gas based on national regulations, technical and market drivers

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Storage of Electricity and Heat

- Need to cover peak demand and surplus supply in short term
- Pumped hydro storage represents currently the main electricity storage option
    - variable renewable power generation challenges the profitability
- Batteries - geographically independent, fast to install, scalable and can provide primary control
- Heat storage is also relevant in the shift to a low carbon economy
    - heat represents about half of the final energy demand
- For any storage technology:
    - Important to refine the position of the various market actors
    - Markets for the storage and flexibility services needed

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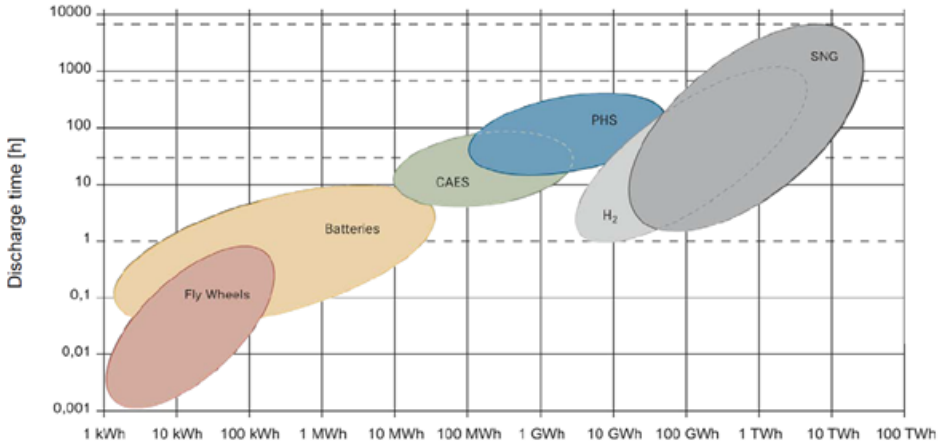
Large scale storage and RES integration

- Diversification of supply and routes is a key component of the EU energy policy
- Strategic energy reserves for crisis situations
- Large scale energy reserves could complement strategic energy reserves
  - Synergies between RES and the natural gas grids
  - Indigenous energy sources more important in future



CAES: Compressed Air Energy Storage
PHS: Pumped Hydro Storage
H_2, SNG: Hydrogen, Synthetic Natural Gas)

Source: Research Center Julich

Energy Storage - analyzed

Large number of studies about energy storage.

- The necessity of storage confirmed from electricity system point of view
- Business cases changing with the power generation mix
- Markets for storage needs review to put value on flexibility and adaptability

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A Strategic Approach to Energy Storage

- Regulatory mechanisms for making energy storage a fully-fledged component of the energy system and markets
- Review strategic energy reserves in line with the energy security strategy
- Create links: energy storage – strategic energy reserves
- Integrate growing shares of RES
- Explore synergies between fossil fuels and RES
- Balance the operation of the electricity, gas and heat networks

European Commission

Thank You for Your Attention!

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http://ec.europa.eu/energy/index_en.htm