



WHAT is the EERA JP on Energy Storage

This JP is set up to increase the effectiveness of R&D on the large field of energy storage through alignment of its European member institutes. It is mainly aimed at **integrating** and **complementing** current national and European **research programmes and projects** in order to **optimise** resources and efforts. It will **accelerate** knowledge development and technology transfer and will be strictly **system and product oriented** by working on all levels of the **value chain**: (1) materials, (2) process line, (3) component and system design, (4) system integration to specific application and (5) overall system integration. The JP will also **establish general roadmaps** for the research needs for the future EC FPs and create improved consortia to cooperate with industry in targeted and challenging projects. A thematic priority will be the development of **hybrid energy storage systems**. The **vision** of the JP is to establish a platform for **Integrated Energy Storage Simulation (IEES)** taking into account interfaces with e.g. smart grids and smart cities.

BACKGROUND

Stationary energy storage supports commercial breakthroughs of renewable energies by overcoming mismatches between energy output and demand and load leveling. **Mobile energy storage** enables electromobility and transportation and **thermal energy storage** is essential for heating, cooling and environmentally compatible industrial processing.

OVERALL OBJECTIVES

- **Joining** forces and projects: coordinated strategies
- **Sharing** knowledge, facilities, methods, data
- Working on **interfaces** within energy storage and **integration** with other technologies
- Establishing **European** scientific, technological and industrial **leadership** in **current** and **next generation energy storage technologies**
- Giving significant **support** for **SET-Plan goals**

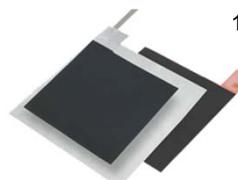
PARTICIPANTS

20 P and 6 A from 12 EC member states: 307 py/y committed

Finland: VTT (P), TUT (A)
 Norway: SINTEF (P), IFE (A), NTNU (A)
 Denmark: DTU (P) UK: UKERC (P)
 France: CEA (P) Belgium: VITO (P), VUB (P)
 Germany: KIT, (P) DLR (P), RWTH (P), FZJ (P), MEET (P)
 Poland: JU + AGH-UST (A)
 Slovakia: IEE SAS (P) Czech Rep.: NRI Řež (A)
 Italy: ENEA (P), RSE (P), CNR (P)
 Spain: CIEMAT (P), IMDEA (P), ICMAB (P), ICMM (P), CNH2 (A)

STRUCTURE AND ACTIVITIES

Five sub programmes (SP's) have been defined. Additionally, a sub programme on Techno-Economics is proposed in order to develop **a pan-European vision** and to assess the externalities of energy storage:



1) **Electrochemical Storage** (Mario Conte, ENEA)
Lithium Ion Batteries, Super Capacitors

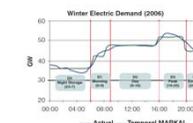
2) **Chemical Storage** (Jean-Philippe Nicolai, CEA)
Hydrogen, Methanol, Ammonia

3) **Thermal Storage** (Doerte Laing, DLR)
Advanced Fluids, PCM, Thermochemical Heat Storage

4) **Mechanical Storage** (Atle Harby, SINTEF)
Hydro, Fly Wheels, Compressed Air

5) **Superconducting Magnetic Energy Storage** (Mathias Noe, KIT)
Materials, System Technology and Cryogenics, Integration

6) **Techno-Economics** (Peter Hall, UKERC)



COMMON RESEARCH OBJECTIVES

- Improving **energy density** and **storage efficiency**
- Costs, safety, reliability, availability, cycle life, calendar life, sustainability, standardization and quality issues, social acceptance, economic and environmental impacts

CURRENT AND FUTURE ACTIVITIES

Due to the rather diverse research and technological requirements of the different energy storage technologies each SP has defined very individual work packages and milestones. However, in the first 12 months **review of activities**, **state-of-the-art evaluation** and **defining next step requirements** will be done in all SP's. Detailed **roadmaps** and **research and engineering design concepts** will be developed for **short**, **medium** and **long term periods**. Reports will be written and workshops organized to document results and decide on next steps. This JP is open for **additional** ES technologies.

COORDINATOR:

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