

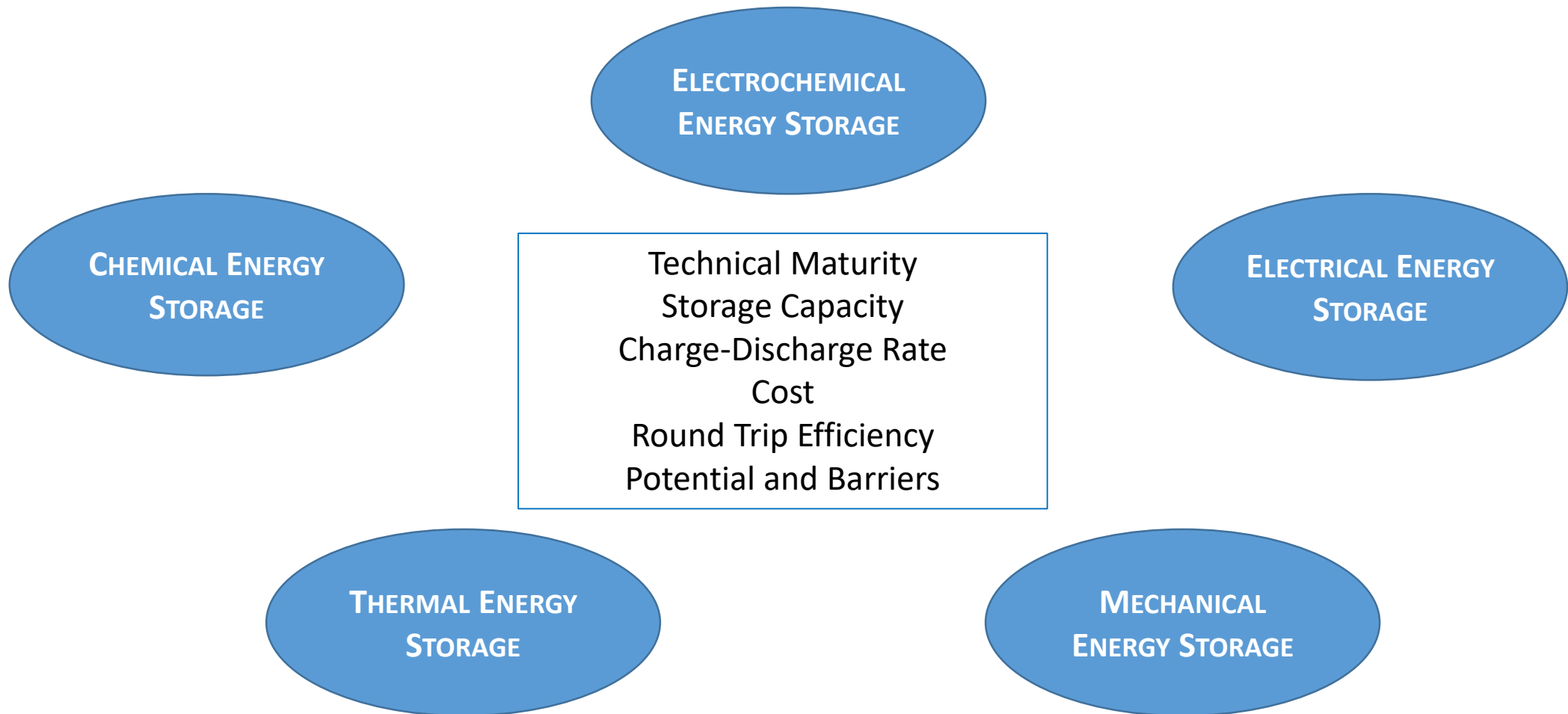
Workshop

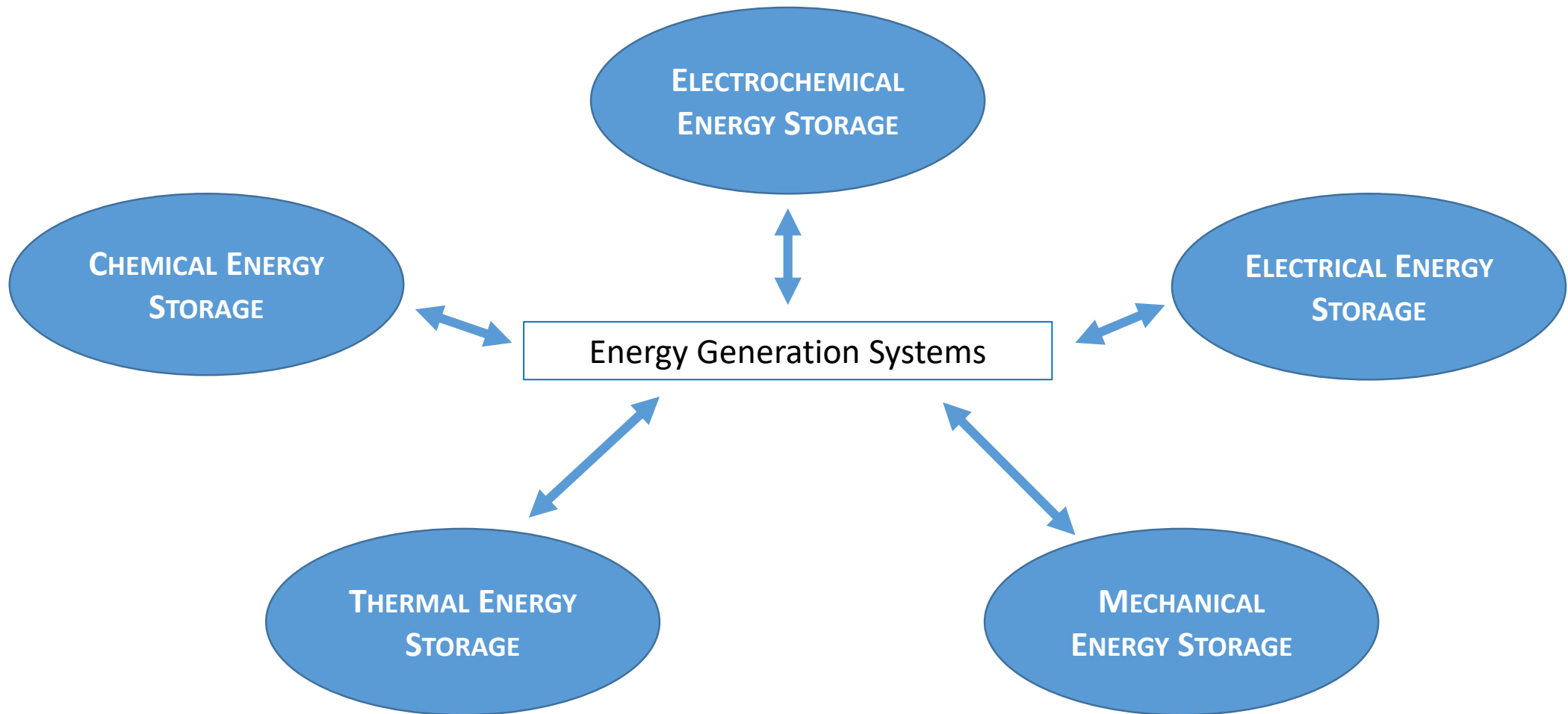
Hybrid Energy and Energy Storage Systems

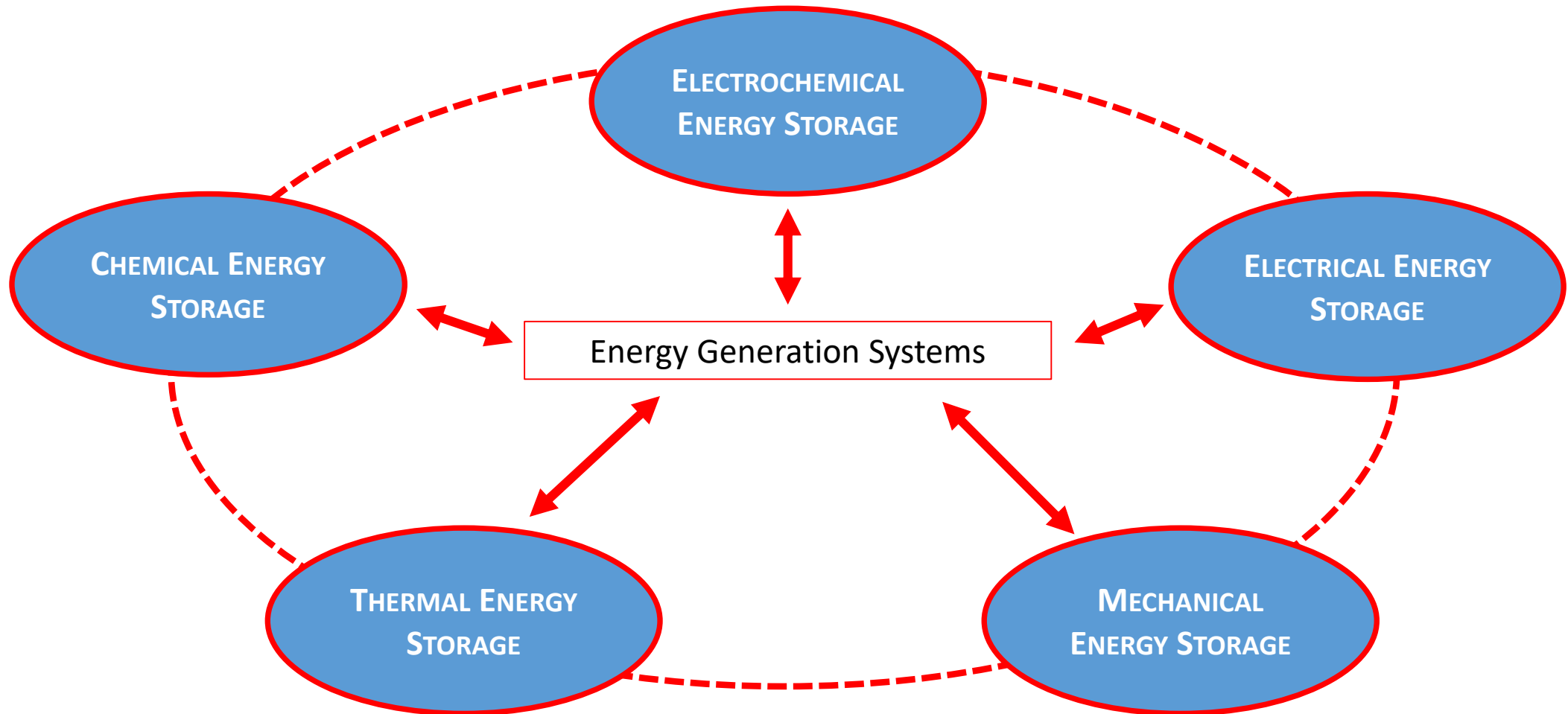
22 March 2017 - San Sebastian

Organized by SP4 - Atle Harby (SINTEF) – atle.harby@sintef.no

Giovanna Cavazzini (University of Padova) – giovanna.cavazzini@unipd.it

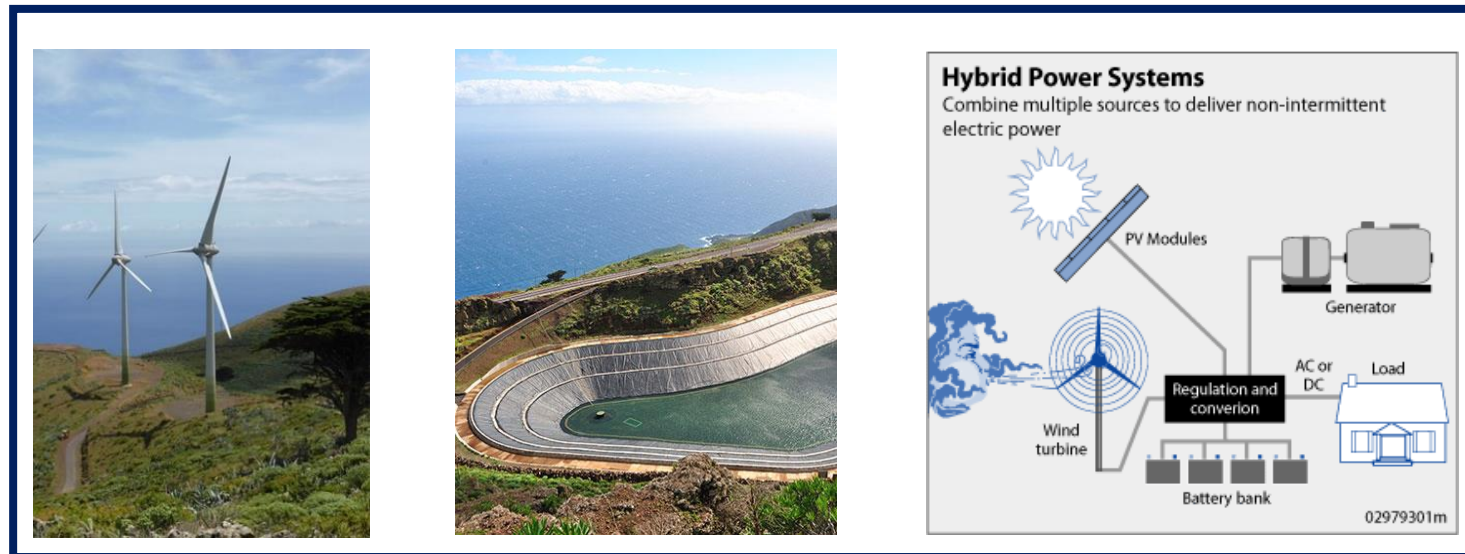






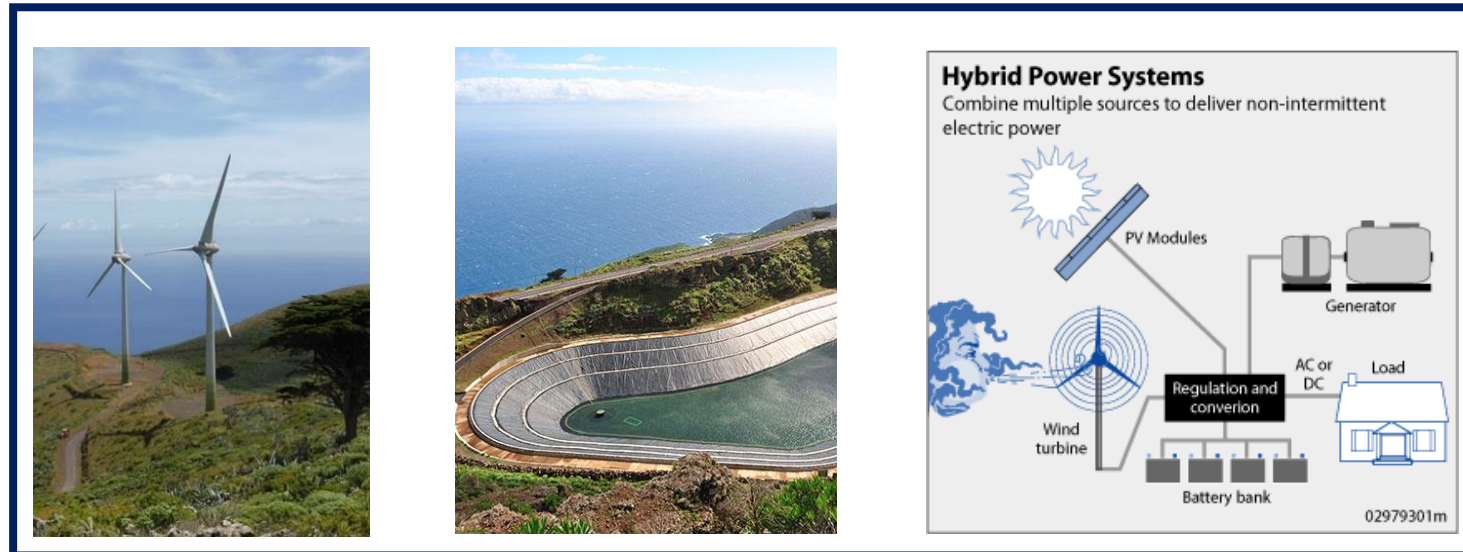
The Workshop Flyer

- Objectives:
To learn about and discuss research questions for the use of different storage technologies in combination, how they can fit together, and how can they be integrated in the grid and their use and need of smart grids to enhance performance
- Target audience:
Scientists working in EERA and industry related to energy storage, smart grids and hybrid energy systems



The Workshop Flyer

- Expected outcome are:
 - Make information on existing hybrid systems available
 - Point out research needs for hybrid energy and energy storage systems and their integration in a smart grid
 - Start the work in producing reports and scientific papers on the advantages and challenges of hybrid systems
 - Produce popular science information on hybrid energy and energy storage to inform policy and public bodies



Hybrid Energy and Energy Storage Systems – Some questions to answer

- Which is the Technology Readiness Level?
- Are they able to increase the deployment of intermittent renewable energy sources?
- Are there solutions more promising than other?
- Which is their potential?
- Are they market-ready?
- Which type of barriers they have to face:
 - ✓ Technical challenges?
 - ✓ Market barriers?
 - ✓ Regulatory barriers?
 - ✓ Policy barriers?
- Do they need any support or market mechanism?

Hybrid Energy and Energy Storage Systems – Workshop Topics

1. CONTRIBUTION OF HYBRID ENERGY AND ENERGY STORAGE SYSTEMS TO THE INTEGRATION OF VARIABLE RENEWABLE ENERGY IN THE POWER SYSTEM
2. CONTROL AND ENERGY MANAGEMENT SYSTEMS FOR HYBRID ENERGY AND ENERGY STORAGE SYSTEMS
3. REGULATORY BARRIERS FOR THE DEPLOYMENT OF HYBRID ENERGY AND ENERGY STORAGE SYSTEMS
4. HYBRID ENERGY AND ENERGY STORAGE SYSTEMS IN A SMART GRID: NEW CONCEPTS AND FUTURE POTENTIAL

Hybrid Energy and Energy Storage Systems – Topic 1

“CONTRIBUTION OF HYBRID ENERGY AND ENERGY STORAGE SYSTEMS TO THE INTEGRATION OF VARIABLE RENEWABLE ENERGY IN THE POWER SYSTEM”

Speakers:

- «*Hybridisation with fast energy storage technologies*» - **Marcos Lafoz** – CIEMAT (ES)
- «*Integrating renewables and storage*» - **Atle Harby** – SINTEF (NO)

Hybrid Energy and Energy Storage Systems – Topic 2

“CONTROL AND ENERGY MANAGEMENT SYSTEMS FOR HYBRID ENERGY AND ENERGY STORAGE SYSTEMS”

Speakers:

- «Control strategies and sizing of a flywheel energy storage plant for the frequency control of an isolated wind-hydro power system» - **Juan Ignacio Perez Diaz** – University of Madrid (ES)

Hybrid Energy and Energy Storage Systems – Topic 3

“REGULATORY BARRIERS FOR THE DEPLOYMENT OF HYBRID ENERGY AND ENERGY STORAGE SYSTEMS”

Speakers:

- «*Title to confirm*» - **Raquel Garde** – CENER (ES)
- «*EU regulatory barriers to energy storage – how to unlock the grid code?*» - **Alfons Weestgest** – EUROBAT (BE)

Hybrid Energy and Energy Storage Systems – Topic 4

“HYBRID ENERGY AND ENERGY STORAGE SYSTEMS IN A SMART GRID: NEW CONCEPTS AND FUTURE POTENTIAL”

Speakers:

- «*Flywheel- Battery Hybrid for Grid Stability*» - **Frank Burke** – Schwungrad Energy (IE)
- «*Novel concepts of increasing the storage at Pumped Storage Power Plants*» - **Pal-Tore Storli** – NTNU (NO)
- «*An innovative configuration of Pumped Thermal Electricity Storage System*» – **Anna Stoppato** – University of Padova (IT)

Hybrid Energy and Energy Storage Systems – Expected OUTCOMES

- Exchange of knowledge between participants:
 - The potential of hybrid systems
 - The challenges to face
 - The barriers to remove
- Report on advantages and challenges of hybrid systems:
 - To identify contributors: (Marcos Lafoz, Helena Navarro, etc..)
 - To identify the target (public bodies, policy bodies, etc...)
 - To identify the way of circulation: ex. Open-access Journal for politicians
- Planning of the second workshop/seminar/conference/meeting

Workshop

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