Unveiling the Future of Energy: Comprehensive Insights from the EERA JP e3s and ES Joint Workshop

Introduction

In June 2023, the EERA Joint Programmes on Energy Storage (JP ES) and clean Energy transition for Sustainable Society (JP e3s) convened a pivotal workshop in Madrid titled "ENERGY FOR THE FUTURE - Exploring Non-Technical Factors for Energy Storage Deployment." This gathering aimed to foster a deeper understanding of the broad spectrum of influences—beyond technology—that will shape the future deployment of energy storage solutions across Europe.

Engaging Foundations: Site Visit and Workshop Goals

Site Visit Insights

The workshop began with an insightful site visit to the Control Centre of Renewable Energies of Red Eléctrica de España. This visit provided participants with a practical look at Spain's current energy management strategies and innovations, setting a tangible context for the subsequent discussions.

*Electricity Control Centre at Control Centre of Renewable Energies of Red Eléctrica de España - **Source:** Red Eléctrica*

Workshop Objectives and Scope

The main focus of the workshop was to understand the regulatory, societal, and economic factors that are just as crucial as

technological advancements in shaping energy storage adoption. Such a multidisciplinary approach is essential for creating a comprehensive strategy for Europe's energy future.

Keynote Presentations and Discussions

Market Dynamics and Regulatory Impacts

Michael Belsnes (SINTEF Energy) provided an in-depth look at the evolving dynamics of the European energy market, particularly how changes in regulation and market mechanisms are necessary to accommodate an increasing share of renewable energy sources.

Advancements in Energy Storage

Manuel Baumann (KIT) discussed the growing demand for energy storage driven by increased renewable energy usage, highlighting the need for innovative technologies in large-scale energy storage projects.

Exploring Non-Technical Dimensions

Business Models and Green Hydrogen

Vittoria Maria Garibbo (Sant'Anna School of Advanced Studies) explored the strategic role of business networks in accelerating the hydrogen economy, focusing on the collaboration required between traditional energy sectors and renewable innovations.

Sustainability Assessments and Material Challenges

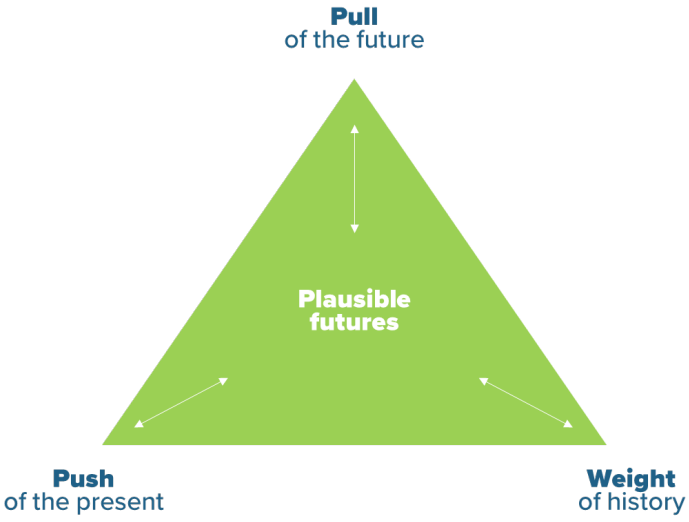
Jens Peters (University of Alcalá) tackled the importance of sustainability in energy storage, particularly how life cycle assessments and critical raw material strategies must be considered in developing sustainable energy storage solutions.

Thematic Breakout Sessions: A Deep Dive

Triangulating Future Scenarios

In a dynamic session using the "Triangles of Futures" methodology, participants envisioned potential futures for energy storage. They tackled historical barriers, current opportunities, and future aspirations, crafting a roadmap that reflects possible technological and societal shifts.

With regard to large-scale, long-duration storage, participants saw a plausible future with a strong participation of H2 technologies and aluminium storage, with a



Futures Triangle, originally developed by Sohail Inayatullah

much less relevant role for thermal storage and high uncertainties regarding the role of European cooperation. Participants also saw a future with a regulated market for off-grid energy storage applications, strongly supported by governments, and with a strong participation of innovative business models ensuring the viability of such applications. Finally, in the area of mobility, there is a clear expected trend towards a future dominated by the concept of mobility as a service, with electric vehicles playing an important role in balancing the grid.

Conclusions and Forward Outlook

Synthesis and Actionable Insights

The workshop underscored the critical need for a holistic approach to tackle the multifaceted challenges of energy storage deployment. The discussions concluded that integrating policy frameworks, market designs, and community engagement is essential for a resilient and sustainable energy future.

Stay Engaged

We invite all of our members to continue shaping Europe’s energy future with us. If you want to be a part of our next workshop and contribute to our discussions, stay tuned to our website for news and updates. Together, we're driving the transition to sustainable energy solutions.