Report of the EERA Expert Workshop
'Opportunities and challenges of batteries for energy storage in the EU'

19 October 2016

The EERA workshop on opportunities and challenges of batteries for energy storage in the EU took place in Brussels on October 19, 2016. The **main objective** of the workshop was to stimulate an in-depth discussion on status and challenges of batteries for energy storage in relation to research, industrial, socio-economic and consumer aspects and to policy initiatives at European level, particularly the Integrated Strategic Energy Technology Plan (SET-Plan). The discussion covered issues related to the broad spectrum of battery applications, from e-mobility to residential storage and stationary applications.

This report provides an overview of the main points of discussion and recommendations to foster the development of batteries for energy storage in Europe, as emerged during the workshop.

The workshop gathered **27 participants** from research, industry, consumer associations and the European Commission, with representatives of four Directorate Generals (the Joint Research Center, DG Energy, DG Research & Innovation and DG Environment). It was led and facilitated by the EERA Joint Programme (JP) on Energy Storage. The JP AMPEA (Advanced Materials and Processes for Energy Applications), JP Smart Grids, JP E3S (Economic, Environmental and Social Impacts) and JP Fuel Cells & Hydrogen contributed to the presentations and the discussion.

The representatives of the **European Commission** emphasized that the EU climate and energy objectives for 2030 (40% greenhouse gases, 27% renewable energy, 27% energy savings) will require additional, dedicated measures, including the deployment of storage technologies. Moreover, it is important to set clear priorities and maximize synergies, e.g. between the transport and power systems, for example by developing energy storage solutions, including next generation batteries that meet transport requirements and enable Europe to develop a manufacturing base for the mass production of this type of solutions. Increasing performance and safety and reducing costs of battery systems used for storage in the automotive and other sectors are the ultimate goals of Key Action 7, '*Become competitive in the global battery sector to drive e-mobility forward*' – the only non-technology neutral action of the SET- Plan. A Declaration of Intent, with targets for R&I actions agreed by the stakeholders, was signed in Summer 2016, and a temporary Working Group will soon start its work to define the implementation plan based on the defined targets.

The participants agreed that **the production of battery materials and battery cells in Europe should not be driven by raw materials (global market) but by industrial maturity of technologies**. The industry plays the main role to go beyond the cell research to manufacturing. It is necessary to foster collaboration between industry and research to join technology readiness and market readiness.

A recurring theme was the relevance of **battery safety**. Nowadays batteries can be considered safe in numerous cases of application. However, more efforts need to be done in order to fully understand

the aging and degradation mechanisms, for example by analysis of quantitatively measured thermal and heat behavior during regular, abuse, and accident conditions. Also battery management systems should be developed which allow monitoring down to cell level. The importance of international harmonization regarding regulation and standards in the field of electrochemical energy storage was also highlighted.

Another conclusion that found broad support amongst the participants was the significance of energy storage to **balance generation of energy**. The European electricity transmission and distribution grids will undergo dramatic changes to accommodate increasing amounts of renewable electricity and, therefore, more flexibility and new technologies are needed to face this transition.

A special emphasis was put on the **energy market design and the consumers**. The new Electricity Market Design should ensure that the energy needs of large and small consumers can be met in Europe. It should take into account the opportunities offered by new technologies and the focus on consumers to develop and deploy new products and services.

In conclusion, a number of **recommendations** to foster the development of batteries for energy storage in Europe were highlighted, in particular:

- Promote EU-based battery cell production to close the gap in the value chain of Li-ion-based batteries and to be prepared for post- Li cell production through the gained knowledge
- Priority R&D issues in material battery research should be evaluated with the prospect to achieve industrial maturity
- Foster research in order to understand the aging and degradation mechanisms of batteries
- Legislative initiatives in the field of electrochemical energy storage should rely on internationally agreed standards and should take industry test standards into account
- Further demonstration of electrochemical energy storage should consider the multi-use to energy system services.

EERA should keep on contributing to the EU objectives in this field through the work on the Integrated SET-Plan and other initiatives, including the one on Putting Science into Standards launched by the European Commission, with battery energy storage being one of the recent priorities.

Key references

Integrated SET-Plan - Key Action 7, 'Become competitive in the global battery sector to drive e-*mobility forward*' – Declaration of Intent:
https://setis.ec.europa.eu/system/files/action7_declaration_of_intent_0.pdf

Additional information about the workshop:
www.eera-set.eu/eera-expert-workshop-on-batteries-for-energy-storage-brussels-19-october

About EERA: www.eera-set.eu

About the EERA Joint Programme Energy Storage: www.eera-es.eu