



*8<sup>th</sup> International Conference on*  
**CLEAN ELECTRICAL POWER**  
*Renewable Energy Resources Impact*

Terrasini, Sicily– Italy  
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## Special Session on Advanced solutions for innovative Battery Management Systems

Li-ion battery technology is a key pillar for the EU energy transition based on Renewable Energy Sources (RESs) and electric mobility. The EU commission proposed a new binding target to reach at least 32% of renewables in the EU energy mix production in 2030<sup>1</sup>, and reduction of 100% of emissions for new sales of cars and vans as of 2035. The necessary exponential growth of the EU li-ion battery market to reach those targets rises sustainability questions, from mining to recycling.

Therefore, unleashing the full potential of circular economy in the battery industry is needed. Fine tracking of battery states and their use in innovative Battery Management Systems (BMSs) is one of the possible technical solutions to improve battery performance, ease reuse, and guarantee safety, as requested by EU commission under the umbrella of the so-called “battery passport”<sup>2</sup>.

This special session aims at gathering contributions able to cope with the above challenge. This relates to the possible contributions dealing with (but not limited to) advanced/innovative:

- New cell chemistry and BMS adaptations.
- Modelling of battery cells (physics-based and/or data-driven).
- Algorithms for SoX<sup>3</sup> estimation.
- Algorithms for Remaining useful Lifetime (RuL) prediction.
- Diagnosis/prognosis methods based on new sensor capability.
- SoC/Voltage balancing methods.
- Fast charging methods.
- Battery Safety, thermal runaway.
- Second-life BMS solutions.

The special session is organized by:

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<sup>1</sup> European Commission, ‘Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: The European Green Deal’.

<sup>2</sup> K. Berger, J.-P. Schöggli, and R. J. Baumgartner, ‘Digital battery passports to enable circular and sustainable value chains: Conceptualization and use cases’, *J. Clean. Prod.*, vol. 353, p. 131492, Jun. 2022, doi: 10.1016/j.jclepro.2022.131492

<sup>3</sup> SoX includes State of Charge (SoC), State of Safety (SoS) and State of Health (SoH), etc.