

## **NMP 17 - 2014: Post-lithium ion batteries for electric automotive applications**

*This topic is a contribution to the Green Vehicles initiative*

Specific challenge: The electrification of road transport is a key towards sustainable and environmentally friendly mobility of persons and transport of goods, in particular for short range transport and transport in urban areas. In order to reach this goal it is important to develop improved cost competitive and sustainable storage technologies for Electrified Vehicles (EV) achieving significantly improved performance with respect to current lithium-ion electrochemical storage technology, to allow the production of EVs that more closely match the performance of current internal combustion vehicles (e.g. and in particular considering the driving range). This challenge is complementary to a separate one present in the “Transport Challenges” Work Programme on the development of competitive lithium-ion batteries to meet customer expectations. This is also in line with the Roadmap of the European Green Vehicle Initiative (EGVI). Research and innovation should build on the progress already obtained through previous projects, particularly those funded within the Green Car Public Private Partnership. It is however important for the European competitiveness that the next generation of batteries will be “made”, i.e. developed and produced in Europe.

Scope: To achieve progress well beyond current lithium-ion cell technologies, various key factors have to be improved at the same time, such as: energy density, power density, the ability to work under severe thermal conditions, charging speed, and inherent safety of the battery cells including crash and abuse conditions. And the ageing of the new chemistries has to be thoroughly understood and improved, in order to achieve a longer battery lifetime. In addition, the future battery has to have a competitive cost; it has also to be produced in an environmental friendly way, considering the availability of raw materials and the batteries’ recycling potential, as well as a sound life cycle assessment. And the knowledge on production-technology and -capacity of cells, packs and systems should be made available. The scope may be reached e.g. by addressing new chemistries that allow high-energy densities, and by developing related specific new materials e.g. for cathodes and electrolytes. In order to accelerate the industrial take-up of the proposed solution, the development of prototypes should be included to show clear progress beyond existing post lithium-ion technology in terms of durability, cyclability and energy density, with consideration of scalability up to full scale for automotive applications.

To be implemented at Technology Readiness Level 5.

*The Commission considers that proposals requesting a contribution from the EU between EUR 6 and 8 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.*

### Expected impact:

- Significant improvements of the usability of EVs, with extended driving range and improved battery durability (recharging, cyclability and safety) obtainable at competitive costs. The energy density of the proposed new batteries should reach at least twice the energy density in comparison to the best in class Li-Ion technology at the same power density;
- Better acceptance of EV in society, and thus contribution to the improvements of sustainable transport, reducing pollution and noise in urban areas;

- European competitiveness through development of new key technology and related production capacities.