MATERIALS FOR SUSTAINABLE SODIUM-ION CAPACITOR

MUSIC PROJECT

MUSIC targets a new supercapacitor technology that reaches energy density comparable to that of power batteries, but still recharges within few seconds and offers long cycle life with minimum efficiency loss over time. MUSIC incorporates a strong policy of sustainability and environmental friendliness. Thus, any use of CRM will be avoided for the development of the SIC technology and advanced novel carbonaceous electrode materials, binders and green electrolytes that are sustainable by design will be developed.

TECHNICAL AND ECNOMIC IMPACTS

• Improvement of 15-20% of the energy and power output of Sodium-ion batteries

BUDGET

5 863 k€

PARTNERS

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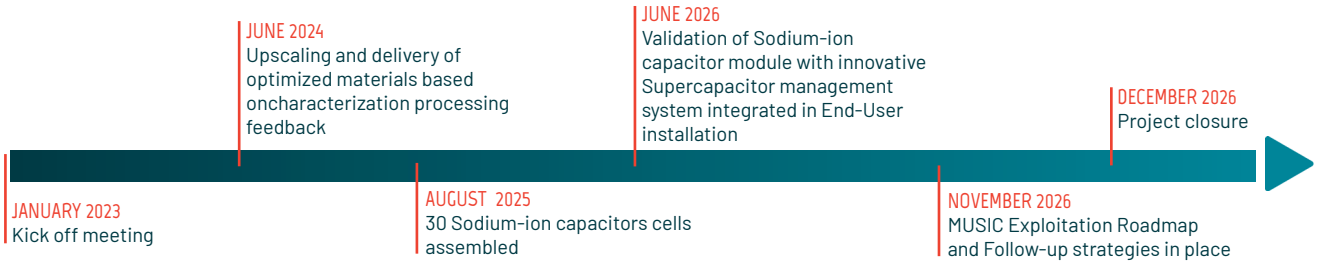
KEY WORDS

Sodium-ion capacitors / Electrical energy storage / Power applications
Advanced materials



INDUSTRIAL CONTEXT

To date, the battery market is dominated by lithium-ion batteries, as they present high energy density, and their costs have dropped by a factor of at least 10 in the last 20 years. However, conventional lithium-ion batteries rely on several critical raw materials and sustainability is a major concern, since Europe is dependent on foreign countries for many of these critical raw materials, what reflects a lack of resilience and a high dependency of supply from other parts of the world.

INNOVATIVE FEATURES

- Manufacture sodium-ion capacitors to contribute to the electrification of the transport and industry (avoiding polluting greenhouse gas gases and CO2 emissions)
- Design sodium-ion capacitors cells with gravimetric energy and power of at least 40 Wh/kg and 10 W/kg and over 100k cycles, enabled by a solution-processable, air-stable, low-cost presodiation strategy
- Sustainable super-capacitors made of sodium, recycled fibres and green chemicals

INDUSTRIAL APPLICATIONS

The materials and processes proposed to be used within MUSIC, are considered a game changer for the development of SICs, fulfilling key requirements identified and defined by the end-users, such as high capacity and excellent rate capability of electrode materials, high ionic conductivity and electrochemical stability of electrolytes, cost efficient as well as environmentally benign processing and advanced sensoring systems.

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