Sodium Batteries for Mobile and Stationary Energy Storage

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Our society is presently facing the great challenge to switch from depleting energy sources like oil, coal, or gas, to renewables such as solar and wind to match the EU 2050 de-carbonisation of energy target. With regard to their inherent intermittency and commonly decentralized generation, however, efficient and sustainable energy storage is of utmost importance. Beside large-scale solutions like hydropower or compressed air, electrochemical energy storage, secondary batteries, is currently considered to be the most suitable technology, particularly for relatively smaller applications like transportation or short- to mid-term stationary energy storage.[1–4] As a matter of fact, the number of electric vehicle (EV) sales is steadily increasing within the past years and the same trend is observed for the implementation of secondary batteries for buffering the intermittent energy supply by solar and wind.[1–4] Consequently, batteries play a vital role for moving towards a more sustainable "energy future", raising, however, concerns about the impact that their production and disposal could have on the environment.[5] Finally, an approach based on splitting the secondary battery into two devices dedicated to Na harvesting and electricity production, i.e., separating the charge and discharge processes, may grant solution for the large-scale, long-term (seasonal/annual) energy storage needed to achieve the EU2050 de-carbonisation target.[6]

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