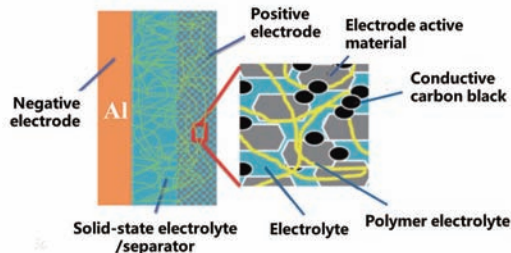


High-efficiency Energy Storage Technology

ENN is focused on the R&D of efficient large-scale storage and application of electric energy, to stabilize the volatility of renewable energy such as solar and wind power at the energy input end, and to meet the peak shifting and frequency modulation requirements at the energy usage end, in order to improve the overall efficiency of the Ubiquitous Energy Network.

Principles & Advantages

At present, ENN is focused on developing the aluminum polymer all-solid-state battery technology. The new type of battery is formed by using the high-voltage positive electrode material with expanded carbon-layer spacing and reduced binding energy, to realize the intercalation/de-intercalation of aluminum ions for energy storage and release, the polymer solid-state electrolyte and the aluminum metal as the negative electrode. The advantages are as follows:



Schematic of Aluminum Polymer Battery

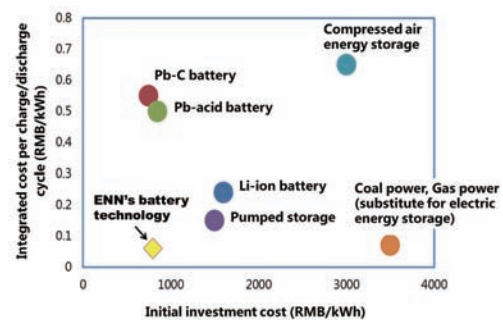
- **Abundant raw material:** the abundance of aluminum in the earth's crust is 4,000 times that of lithium, thus the material cost of manufacturing battery would be further reduced;
- **Long cycling life time:** aluminum ions are easy to intercalate/de-intercalate the positive electrode material, having less damage to the electrode structure and thus leading to an extremely long charge/discharge cycle life;
- **Stable electrochemical performance:** the polymer solid-state electrolyte enables the battery to work in a wide temperature range, and the energy performance is highly stable under various working conditions;
- **Easy manufacturing process:** aluminum has low chemical activity, thus the requirement for production environment and device packaging is low, which is easy for the scalability of the new technology.

R&D Capability

ENN has built a complete battery R&D platform of material synthesis and characterization, battery assembly and testing. What's more, ENN has the pilot test line to manufacture prototype of battery products with customer-designed shapes and sizes. The R&D team is composed of the "Thousand Talents Program" experts and battery researchers and engineers with years of experience in related field. ENN has developed strategic cooperation plan with world-famous universities and research institutes both at home and abroad such as the Massachusetts Institute of Technology (MIT) and College of Engineering of Peking University.

Technology Prospect

The existing commercial lithium-ion battery products have the drawbacks of high-cost, poor reliable performance and short life time, which is not suitable for large-scale energy storage application. With the R&D of aluminum polymer all-solid-state battery technology, ENN seeks breakthrough in innovative battery technology, aiming to remarkably reduce the cost and improve the reliability of the battery in the next 3-5 years, finally to achieve the goal of 10 MWh level application of large-scale energy storage.



Energy Storage Technologies Comparison