Sodium battery vs lithium cost

Sodium battery vs lithium cost

Home - Energy Storage Knowledge - Sodium ion battery vs lithium ion – comparing which is better?

Electrochemical energy storage is the process of energy storage, release and management completed by batteries. Its working principle is energy storage technology and measures that store electrical energy through media or equipment and release it when needed.

According to the technical route, electrochemical energy storage can usually be divided into various secondary battery energy storage such as lithium-ion batteries, sodium-ion batteries, flow cell batteries, lead-acid batteries, and cutting-edge technologies. This article will mainly explain different energy storage technologies through sodium ion battery vs lithium ion.

Lithium-ion batteries are currently the most widely used new energy storage technology. Its typical technical characteristics are: high energy density, mostly between 140 Wh/kg and 220 Wh/kg, and cycle times of 2,000 to 10,000 times. Energy conversion the efficiency is about 85%-90%, and the response speed is fast, usually at the millisecond level.

Lithium-ion batteries usually consist of positive electrodes, negative electrodes, electrolytes, separators, and related auxiliary materials. Among them, electrode materials and electrolytes are key links that affect the performance of lithium-ion batteries. According to different cathode materials, lithium-ion batteries can be mainly divided into lithium iron phosphate batteries, nickel-cobalt-manganese ternary lithium batteries, lithium cobalt oxide batteries, and lithium manganate batteries. Different technical routes are suitable for different fields, mainly including consumer batteries, power batteries and energy storage batteries.

First of all, sodium-ion batteries are very similar to lithium batteries in principle, that is, charging and discharging are performed by utilizing the round-trip migration of Na+ between the positive and negative electrodes. During battery charging, Na+ comes out of the positive electrode, passes through the separator through the electrolyte and is embedded in the negative electrode, so that the positive electrode is in a sodium-poor state of high potential, and the negative electrode is in a sodium-rich state of low potential. The discharge process is opposite.

Lithium resources are still relatively scarce globally, but sodium is not scarce. So when the price of lithium carbonate is rising and the price of lithium battery is also rising, sodium battery reappears in the industry’s vision. Substituting cheap sodium for lithium will create a sodium battery that is slightly inferior in performance, but cheaper and more cost-effective overall. This is the original intention of sodium batteries being re-emphasized.

But now as the price of lithium carbonate falls, the prices of other materials in the industry chain have also

fallen sharply. Now the price of power lithium iron phosphate batteries has fallen below 0.5 yuan/WH, with the latest price being 0.47 yuan/WH, while the current price of sodium battery cells is about 0.67 yuan/WH. In such a comparison, the cost-effective advantage of sodium ions is gone. When comparing sodium batteries and lithium batteries at the same level, lithium batteries are still better.

Since sodium-ion batteries can use aluminum foil as the negative electrode current collector, the same aluminum tabs can be used for the positive and negative electrode sheets, and related processes such as tab welding can be simplified. Therefore, the existing battery assembly production line for lithium-ion batteries can be used to produce sodium-ion batteries with slight modifications and parameter adjustments. The replacement cost of developing sodium-ion batteries is very low.

Although the research and development and mass production of sodium electricity are currently progressing in an orderly manner. However, due to the current sharp decline in the price of lithium carbonate, the cost of sodium electricity does not have a significant advantage in the short term, which has delayed the progress of large-scale commercialization of sodium electricity to a certain extent.

Since the performance of sodium batteries is worse than that of lithium batteries (at the same level), sodium batteries are not currently used in mid- to high-end vehicles because there is a gap between them in energy density and charging rate compared to lithium batteries.

At present, the main application fields of sodium batteries include two-wheeled vehicles, A00-class cars, and energy storage. And for a long time, sodium batteries will basically only be used in these three fields.

Contact us for free full report

Web: https://kary.com.pl/contact-us/
Email: energystorage2000@gmail.com
WhatsApp: 8613816583346