Salt battery storage

Salt battery storage

The episode of LE IENE entitled "Renewables, the storage and battery revolution" generated a great deal of interest in molten salt batteries, which, however, are neither a new nor a perfect technology. Here we analyse how it works, and the pros and cons.

Energy saving and sustainable development are at the heart of a global debate increasingly focused on the energy transition towards the use of renewable energy sources, driven by an increased awareness of the damage caused over time by the intensive exploitation of energy resources and climate change that has convinced countries to adopt green initiatives and policies.

In order to safeguard our and our planet’s health, a radical change in thinking and shared action is absolutely essential, but it is also important to clarify the technologies available today that are truly effective, without falling into the traps generated by false information.

Everyone agrees, our future will be driven by renewable energy, such as wind and solar power, but we must be careful: we are talking about intermittent renewable sources, as they derive from natural flows that are not always available and often difficult to control. We should remember that the sun does not always shine and the wind does not blow every day, so how can their energy be fully exploited?

The introduction of lithium batteries allows us to exploit renewable energies as much as possible through the creation of storage systems, which allow us to store energy and then use it when natural sources fail to deliver it. There are an increasing number of solutions available in the field of energy storage, but not all of them are yet efficient.

The media fuss that was generated after the episode of the well-known Italian TV programme LE IENE on 18 October 2022 entitled "Renewables, the storage and battery revolution" brought the topic of molten salt batteries into the spotlight. This technology is certainly interesting, but neither new nor perfect, as instead it was described. In the Mediaset report, in fact, salt batteries are portrayed as an ideal solution for electrification: high-performance, ecological, safe, almost eternal batteries… But where is the catch?

We talked about it in episode 45 of Battery Weekly 2022, our weekly column on the world of batteries, where our electrification experts Marco Righi, Alan Pastorelli and Daniele Invernizzi shed some light on this much-discussed technology, recounting its origins, uses, advantages and, above all, its many limitations.

So-called “salt” batteries, not to be confused with sodium-ion batteries, are actually sodium metal chloride (SMC) batteries, consisting of a metal-based cathode and a molten sodium anode, enclosed in a steel casing and separated by a ceramic membrane that allows their ions to pass through, but not the electrons, which instead move through an external electrical circuit, during charging or discharging.

Salt battery storage

Salt batteries consist of many cells that contain a mix of different materials inside them besides salt, such as alumina, iron, sodium or other derivatives such as ferrous chloride and sulphide, nickel chloride, sodium tetrachloroaluminate, etc.

In order to explain how this works, we have taken our cue from the data sheet of the FZSONICK salt battery manufacturer quoted in the report, which illustrates the process in detail, explaining how in the discharge phase, the active materials are sodium chloride and metal powders, predominantly nickel-based, while in the charging phase, these are converted to sodium chloride and metal.

The solid-state electrolyte is ss-alumina, which allows the transport of sodium ions and provides insulation between anode and cathode. The cells must be heated to a temperature of approximately 250 ?C to function and are thermally insulated by a special casing.

Many people will ask: but isn’t 250?C too much? High temperature is precisely one of the characteristic aspects of these batteries. The sodium chloride used must be molten for it to work, which is why the temperature must be kept so high: the salt battery, in fact, only works when the salt is molten and this, like many other salts, melts at extremely high temperatures of 200 to 300 degrees: these are precisely the internal working temperatures of these batteries.

Contact us for free full report

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