

# Liquid cooling energy storage working principle

What is a liquid air energy storage system?

An alternative to those systems is represented by the liquid air energy storage (LAES) system that uses liquid air as the storage medium. LAES is based on the concept that air at ambient pressure can be liquefied at  $-196\text{ }^{\circ}\text{C}$ , reducing thus its specific volume of around 700 times, and can be stored in unpressurized vessels.

How does cold energy utilization impact liquid air production & storage?

Cold energy utilization research has focused on improving the efficiency of liquid air production and storage. Studies have shown that leveraging LNG cold energy can reduce specific energy consumption for liquid air production by up to 7.45 %.

What is the exergy efficiency of liquid air storage?

The liquid air storage section and the liquid air release section showed an exergy efficiency of 94.2% and 61.1%, respectively. In the system proposed, part of the cold energy released from the LNG was still wasted to the environment.

How is stored cold energy used in LFU?

The stored cold energy is reused in the LFU to improve the liquid air yield and increase energy efficiency. The high-pressure air is then heated by the environmental heat first before superheated by stored compression heat, and finally expanding in an air turbine train to generate electricity (state 8-9). Figure 2.

Is liquid air a viable energy storage solution?

Researchers can contribute to advancing LAES as a viable large-scale energy storage solution, supporting the transition to a more sustainable and resilient energy infrastructure by pursuing these avenues. 6. Conclusion For the transportation and energy sectors, liquid air offers a viable carbon-neutral alternative.

Why is liquid cooling important?

Liquid cooling is extensively studied by researchers because of its high cooling efficiency, ease of maintenance, and ability to be commercialized in large quantities. Table 2. Summary of thermal management technology for LIBs. Easily arranged and economical. Poor heat transfer performance. High heat dissipation capacity and mature technology.



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