

The prospects of liquid cooling energy storage in Ethiopia

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.

Can a hybrid energy storage system improve thermal energy recovery?

Future prospective can aim to develop LAES hybrid solutions with an efficient thermal energy recovery system. Liquid air energy storage (LAES) represents one of the main alternatives to large-scale electrical energy storage solutions from medium to long-term period such as compressed air and pumped hydro energy storage.

Do electrochemical energy storage systems improve economic performance?

Despite the higher round-trip efficiency of electrochemical energy storage system, the LAES showed a better economic performance due to the lower capital cost, decreasing, in turn, the return of the investment. Legrand et al. proposed a techno-economic study of a 100 MW LAES plant integrated into the Spanish power grid.

What is the storage section of a liquefaction evaporator (LAEs)?

The storage section of the LAES stores the liquid air produced by the liquefaction cycle in unpressurized or low pressurized insulated vessels. The energy losses for a LAES storage tank can be estimated to be around 0.1-0.2% of the tank energy capacity per day, which makes the LAES suitable as a long-term energy storage system.

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.

What are the key performance indicators of energy storage systems?

LAES key performance indicators In order to compare the LAES with other energy storage technologies and evaluate the potential of the system, the performance is the first parameter that needs to be evaluated. In such a system, as well in all the energy storage systems, the main performance parameter is the round-trip efficiency $R T$.

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fuels. Geothermal energy is used in agriculture, livestock breeding, agro-industry, aquaculture, ...

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