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Thermodynamic analysis of a novel liquid air energy storage system

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In this study, a novel liquid air energy storage system is proposed for electrical power load shifting applications. It is a combination of an air liquefying cycle and a gas-turbine power generation cycle without combustion, including cold-energy regeneration. A thermodynamic calculation is conducted to investigate the performance of this system, and the optimization analysis is performed to improve the system efficiency. The results show that a novel liquid air energy storage system could be a very effective system for electrical power storage with high efficiency and high energy density, and have extensive application prospects.

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