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## **C3Po1E-04 [27]: A comparative study of two novel liquid air energy storage systems with LNG cold energy recovery**

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Due to the nature of fluctuation and intermittency, the increasing penetration of wind and solar power will bring a huge impact to the power grid management. Therefore the concept of liquid air energy storage system was proposed. Compared to compressed air energy storage, liquid air energy storage has a larger storage capacity and no geographic constraints owing to the high density of liquid air. In order to obtain the optimum system design, two different liquid air energy storage systems with LNG cold energy recovery were studied. For one system, the LNG cold energy was used to precool the compressor inlet air temperature to decrease the compression work. For another one, the LNG cold energy was applied to supplement the cold energy needed to liquefy the air and realize a higher liquefaction ratio. Thermodynamic analysis based on steady-state mathematical model was employed to evaluate the system performance difference. The result shows that the former system has a higher thermal and exergy efficiency while the latter system has a larger energy storage density.

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