

In the present study, an integrated power generation system with liquid nitrogen recovery as a cryogenic energy storage system is developed. For this purpose, by producing pure nitrogen through air separation unit and liquefaction it during off-peak time and recovery it at the on-peak time, the required power of the grid is supplied.

Liquid air/nitrogen energy storage and power generation are studied. Integration of liquefaction, energy storage and power recovery is investigated. Effect of turbine and compressor efficiencies on system performance predicted. The round trip efficiency of liquid air system reached 84.15%.

There are some studies in the literature that propose useful guidelines/tips to use liquid nitrogen in energy storage systems. In fact, the main objective of the reported studies is to use stored heat is used to preheat the power generation cycle at peak shaving.

Wang et al. (2020) developed a liquid nitrogen energy storage structure using an air separation unit, nitrogen liquefaction cycle, and gas power generation plant. The results illustrated that the round trip and exergy efficiencies of the multifunctional LAES structure were 38.5% and 59.1%, respectively.

The main problems of liquid air energy storage systems are the high cost of development and low energy efficiency. In the present study, an integrated power generation system with liquid nitrogen recovery as a cryogenic energy storage system is developed.

The cryogenic energy storage (CES) systems refer to an energy storage system (ESS) that stores excess system energy at off-peak times in a supercooled manner at very low temperatures with operating fluids such as nitrogen, natural gas, and helium and provide the system required energy at on-peak times (Popov et al., 2019).

This paper proposes a novel stand-alone liquid air energy storage (LAES) system to enhance round-trip efficiency (RTE) using a thermal energy storage system. Thermal energy storage comprises sensible heat

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This paper proposed a novel NGCC process (NGCC-LNES) for liquid nitrogen storage power generation and carbon capture using LNG cold energy, which can be used to ...

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In this article, we describe a cryogenic energy storage unit (ESU) working in the 65K - 80K temperature range that can be used alternatively (Figure 1):

- o For reduction of the temperature drift in a case of sudden heat bursts;

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Cryogenic energy storage (CES) is the use of low temperature liquids such as liquid air or liquid nitrogen to store energy. [1] [2] The technology is primarily used for the large-scale storage of electricity. Following

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