A novel conceptual design of LNG-sourced natural gas peak-shaving with gas hydrates as the medium

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April 05, 2024

Abstract

Efficient peak-shaving technology is critical to couple with the ever-increasing natural gas demand, especially in the regions lack of natural gas resources. The aim of this paper is to present a novel natural gas peak-shaving process with gas hydrates as the medium to address the issue of natural gas supply and demand imbalance, especially for the LNG-sourced natural gas, in which the cold energy from LGN gasification can be efficiently utilized. Firstly, the whole process, including the production, storage, and dissociation of NGH is designed; afterwards, energy consumption analysis and economic accounting are conducted; finally, a case study is carried out to show the efficiency of the technology. The results show that the economic effectiveness can be improved maximumly by 9.42% compared to the traditional operation model of LNG receiving terminal, indicating the feasibility of providing a flexible natural gas peak-shaving process with the gas hydrate as medium.

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