Economic Dispatch of Hydrogen Systems in Energy Spot Markets

Hydrogen system, as a new energy carrier, could deliver clean and efficient energy services in a wide range of applications. This paper presents an economic dispatch-based mathematical model that facilitates investigations on the techno-economic feasibility of hydrogen systems in the context of energy spot markets. The generic hydrogen system is comprised of an electrolysis for hydrogen production, a hydrogen storage tank and a fuel cell system for cogeneration of electricity and heat. A case study is presented with information from practical hydrogen systems and the Nordic energy markets to demonstrate the effectiveness of the proposed model and approach.

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