

Feasibility Study of Hybrid System integrating Wind Powers and Fuel Cells

이동현, 이인범, 류준형^{1,†}
포항공과대학교; ¹동국대학교
(jhryu@dongguk.ac.kr[†])

Hydrogen has been used for many applications. Another promising one is a storage of excess energy from energy sources, mainly renewable sources. The stored hydrogen can be used again later instead of electricity in the event of short supply. Such flexible hydrogen thus plays an important role in the forthcoming economic environments in which multiple energy sources should be used for stability purposes. Multiple sources can be organized into a hybrid system to have a synchronized effect. This paper investigates the technical and economic feasibility of the hybrid system. This paper is specifically concerned with a hybrid system consisting of a wind turbine, an electrolyzer, hydrogen storage, and a fuel cell. Excess energy produced by the wind turbine is transformed into hydrogen by electrolyzer and stored. The hydrogen may thus be used directly as a fuel or converted back to electricity by a fuel cell later. Therefore, the redundant wind power that could be curtailed can be stored and used again.