> Thursday, October 13th, 2022
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OPERATIONS MANAGEMENT

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‘SWEDISH ELECTRICITY AND HYDROGEN MARKET: AN OUTLOOK’

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ABSTRACT

The European Union expects that hydrogen will play a vital role in future energy systems. Since the anticipated new applications of hydrogen in fuel cell vehicles and steel production, economic feasibility of producing hydrogen needs to be studied for the infrastructure investments. Clean hydrogen can be produced where there is a surplus supply of electricity at low prices, or by using renewables such as solar and wind energy. This presentation therefore provides two hydrogen production cases, respectively a Swedish nuclear power plant, and a hydrogen refuelling station. The study reveals that hydrogen production brings alternative opportunities for large-scale electricity production facilities in Sweden. Factors such as hydrogen price will be influential and require in-depth investigation. In addition, in a decentralized production such as refuelling stations, wind speed is crucial in reducing the cost, whereas solar radiation has less influence. In addition, a combination of solar and wind brings better performance in an off-grid scenario. The most encouraging finding is the cost of 35–72 SEK/kg (3.5–7.2€/kg), which is competitive with reported costs in other EU countries, especially since this cost excludes any government support scheme. The study provides a reference for investors and policy makers foreseeing the industrial landscape for hydrogen energy development.

Keywords: Electricity production, price, renewable energy, hydrogen, system dynamics

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