Uji Kinerja *Smart Grid Fuel Cell* Tipe *Proton Exchange Membrane* (*PEM*) dengan Penambahan Hidrogen (*Performance Test of Fuel Cell Smart Grid Type Proton Exchange Membrane (PEM) by Adding Hydrogen*)

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Abstract

Fuel Cell Membrane Proton Exchange is a form of renewable energy system working based on electrochemical and producing unidirectional electro influx (DC) without remaining pollutant. This system uses hydrogen as a reactant and Oxygen as an oxidant. This research focuses on one kind of fuel cell that is Proton Exchange Membrane (PEM). This study can be used as a basic of preliminary study for future studies. The result of this study showed with the square of membrane surface which is as big as 2 x 10 cm^2, it produced a light on a lamp. On the other hand, by using a gas, the result of electrolysis, as big as 0,025 Watt with 8,495% efficiency, and when it was added by hydrogen with open input 30^0, the power produced was 0,272 watt with 31.092% efficiency. While when it was added by hydrogen with open input 45^0, the power produced was 0,277 watt with 26,355% efficiency. It can be concluded that the speed of the chemical energy entering the Fuel Cell affected the continuity of the product of electrical energy.

***Keywords** : Electrochemical, Hydrogen, PEM fuel cell*