

The feasibility of solar-power-based hydrogen economy in Indonesia

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Submission Category:

(A) Technical research proposal to solve concrete problems

SDGs Targets/Indicators:

(7) Affordable and clean energy

(11) Sustainable cities and communities

(9) Industry, Innovation and Infrastructure

(13) Climate action

Abstract:

The energy demand in Indonesia, the largest country in Southeast Asia, is growing rapidly due to its positive economic and population growth. To meet this increasing demand, Indonesian government currently relies heavily on fossil fuels with coal, gas and oil combine account for 87% of the country's energy supply. Recently, Indonesia has started to add more renewables into the energy mix, with the implementation aim of 23% by 2025 and 31% by 2050. One of the key technologies that can be implemented to realize this goal is photovoltaic power generation with hydrogen as its energy storage system.

The technological maturity of solar panels has reached the point where the price of a photovoltaic power generation is economically competitive compare to the fossil fuel-based power generation counterpart. But, in order to be practical, solar power generation system requires support from an efficient and flexible energy storage system. Production of hydrogen fuel as a mean to store electricity offers two advantage when compares to the battery storage system; **flexibility and mobility**. Given the unpredictable nature of weather and the sheer size of the country, these advantages might play a major role in the creation of an efficient renewable system with large scale implementation area.

In this proposal, we suggest a systematical approach to calculate the economic cost for the implementation of solar-power-based hydrogen system, the necessary technology to create a country wide hydrogen economy and the perceivable impact of hydrogen economy to the growth of Indonesian economy. It is our hope that the research proposed here becomes a starting point for future collaboration with Indonesian government, academia and private sector that will enable a thorough potential and economical investigation of hydrogen economy in Indonesia.