

CEST02_008

DESIGN OF HYDROGEN DROP-IN FUELING STATION

Mohammed fawzi^{1*}, Tarek A. Hamad², AL-Hassan M. Azouz³

Sustainable and Renewable Energy Engineering Department, Omar Al-Mukhtar University, El-Beida, Libya ^{1,2}

Mechanical Engineering Department, Omar Al-Mukhtar University, El-Beida, Libya ³,

mohammed.fawzi@omu.edu.ly

ABSTRACT

A lot of developed countries around in the world are currently on the race to find low-cost sustainable and clean energy sources. They try to avoid conventional energy sources (oil, coal... etc.) for several reasons, such as the negative effect on the environment Like the Greenhouse Gas (GHG) emissions problem and the fact that these resources are depleting in the near future. As a result, they are searching for a better replacement for the fossil fuel either by converting to the electric vehicles or by using other possible fuels from renewable resources that have low (GHG) emissions. Hydrogen is one of the main promising future replacement of the conventional automobiles fuels due to its great mass to energy ratio and its abundance hence it can be extracted from a wide range of sources and by various methods, for example, it can be extracted by anaerobic digestion from organic matter making it a potential candidate for a clean and renewable energy. Hydrogen fueling stations are expected to have a noticeable effect on the introduction of hydrogen as fueling replacement to the global fuel market. The main target for this new branch of stations is not only to introduce the concept of hydrogen as fuel in the vehicle fueling market but also to advertise the development of hydrogen fuel infrastructure while minimizing the risk to the investor. However, there are some aspects that need to be studied with such drop-in stations like storing and delivering systems. The basic concept of such a design is to provide a clean sustainable and affordable source for vehicle fuel compared to the conventional vehicle fuels in the market whether if they are renewable or not. The main objective of this study is to design a safe adaptable and economic drop-in hydrogen fueling station.

Keywords: Renewable energy, Drop-in hydrogen, Fueling station, Design