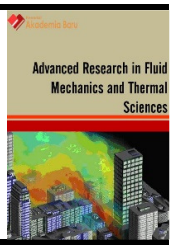
Penerbit Akademia Baru

Journal of Advanced Research in Fluid Mechanics and Thermal Sciences

Journal homepage: www.akademiabaru.com/arfmts.html
ISSN: 2289-7879



A Comparative Study of Levelized Cost of Electricity Between Photovoltaic and Concentrated Solar Powered Power Plants in Malaysia

Open Access

Faizal Baharum[1,*], Muhamad Hanif Hassan[1], Mohd Dzulkarnaen Sudirman[1], Mohd Nasrun Mohd Nawi[2], Siti Halipah Ibrahim[3]

[1] School of Housing, Building and Planning, Universiti Sains Malaysia 11800, Penang, Malaysia
[2] School of Technology Management and Logistic, Universiti Utara Malaysia, 06010 Sintok, Kedah, Malaysia
[3] Department of Civil Engineering, Faculty of Engineering, University Malaysia Sarawak (UNIMAS), 94300 Kota Samarahan, Sarawak, Malaysia

ARTICLE INFO

Article history:
Received 19 August 2018
Received in revised form 23 September 2018
Accepted 28 September 2018
Available online 12 October 2018

Keywords:
Renewable Energy, Photovoltaic (PV) technology, Concentrated Solar Power (CSP) technology, Levelized Cost of Electricity (LCOE)

ABSTRACT

Renewable Energy (RE) is crucial in energy generation towards a more sustainable and low-carbon approach. One of the well-known sources of RE is the sun through solar energy harvesting. Equatorial region like Malaysia seems to be at the very best advantage for generating energy from solar since that it receives sufficient solar radiation for the purpose. Photovoltaic (PV) and Concentrated Solar Power (CSP) technology are the current technology in harvesting solar energy to generate power. However, referring to the Malaysian context today it seems that solar PV is the only technology practiced as one of the RE technologies that are eligible for tariff payment. The purpose of this study is to investigate the future prospect on current solar technologies which are PV and CSP by determining Levelized Cost of Electricity (LCOE) and land usage comparison to determining the cost comparative between solar technologies for future sustainable energy generation. The result is very positive as CSP has the advantage to be the future sustainable energy generation in Malaysia although there are some setbacks at the moment. Collaboration between all parties such as researchers, industry players as well as support from the government will aligned CSP on the right direction upcoming years to come.

1. Introduction

Malaysia, covering an area of approximately 329,750 km^2 located strategically in South East Asia [20]. With the population about 30 million people in 2013, it is expected that the number could increases to 40 million people by the year 2040 referring to 1.1% average annual rate [11]. These numbers reflect high energy demand especially in term of electricity. The International Energy

* *Corresponding author.*
E-mail address: faizalbaharum@usm.my (Faizal Baharum)