International Journal of Mechanical and Production Engineering Research and Development (IJMPERD)
ISSN (P): 2249–6890; ISSN (E): 2249–8001
Vol. 11, Issue 4, Aug 2021, 203-228

Original Article

ENERGY SECURITY: INVESTIGATING WIND ENERGY FOR AIRPORTS IN SOUTH AFRICA – A TECHNOECONOMIC ASSESSMENT

JERUSHA JOSEPH & Prof. FREDDIE INAMBAO

Department of Mechanical Engineering, University of KwaZulu-Natal, Durban, South Africa

ABSTRACT

Establishing a low carbon energy mix to reduce the acceleration of climate change is key for countries, organizations and industries providing services and producing goods for public consumption. Establishing a new energy source for the purposes of satisfying energy needs is a challenge that has many dimensions. Most endeavours to establish alternative energy sources in developing countries face unique challenges that may render their establishment as a reliable energy source unsuccessful. Wind energy is particularly difficult to harness for airports due to wind turbine technology operations being incompatible with the radar operations of airports. This paper presents the investigation of establishing a suitable wind energy technology including its technical and economic assessment (technoeconomic assessment) to ensure a reliable and feasible transition for airports in South Africa.

KEYWORDS: Technoeconomic assessments, renewable energy, alternative energy, feasibility of renewable energy, wind energy, airports and wind turbines, vertical axis wind turbines

Received: May 09, 2021; **Accepted**: May 29, 2021; **Published**: Jun 30, 2021; **Paper Id.**: IJMPERDAUG202117

……Equation 1 is the coefficient of performance and is governed by the Betz limit which is 0,59 is the density of the air is the swept area is the wind velocity ……...……Equation 2 net cash inflows – outflows during a single period ……Equation 3