World Academy of Science, Engineering and Technology
International Journal of Computer and Systems Engineering
Vol:16, No:09, 2022

A Sustainable Energy Portfolio for Greater Kampala Metropolitan Area by the Mid-Century

Authors : Ismail Kimuli

Abstract : With a steadfast economic development, the Greater Kampala metropolitan area (GKMA) faces increasing pressures to increasetheshare of low-carbon electricity in the energy balance, abate CO2 emissions and also restructure the transportation sector for a sustainable 2050. GKMA, is Uganda's commercial, political, social, and industrial hub with a population of 4.1 million, contributing 60% tothe nation's GDP and accounts for 80% of Uganda's industrial sector.However, with the rampant anthropogenic interference that causes climate change, CO2 emissions in the metropolitan are contributing to global warming. Many economies across the globe are addressing this challengethrough development and analysis of sustainable energy portfolios.A sustainable energy portfolio is a low-carbon scenario. The study reviews the literature to establish the current energy management situation of GKMA and finds it wanting in addressing the immediate challenges associated with energy management of the metropolitan. Then, the study develops and examines a sustainable energy portfolio for GKMA using TIMES-VEDA and then presents it as an investigative low-carbon energy scenario that could propel the metropolitan sustainably towards 2050.Sustainability is plausible by optimizing the total primary energy supply, generating low-carbon electricity from hydropower and PV-solar renewables, improving heating technologies for residential & commercial sectors, and switching 90% of land passengers from road to a Kampala metro for a sustainable mid-century.

Keywords : GKMA, sustainability, TIMES-VEDA, low-carbon scenario
Conference Title : ICSMO 2022 : International Conference on System Modeling and Optimization
Conference Location : San Francisco, United States
Conference Dates : September 27-28, 2022