

Abstract

Energy security is defined as the vast availability of various energy sources at affordable pricing within a country. Energy security encompasses all energy forms, external and internal linkages which bring energy to the final consumer. South Africa can reach energy security by incorporating alternative renewable energy sources such as solar power in the national energy system to generate and transmit sustainable electricity for consumption. Renewable energy can develop a consistent energy supply whilst lowering GHG emissions and reducing energy waste output. A consistent energy supply can also increase production in the manufacturing industry specifically the plastic packaging sector.

The main fuel consumed in municipalities is electricity as the industrial nature of certain municipalities dominates their energy and emissions profile because of the nature of the industries in which they exist. The economy of South Africa relies heavily on the packaging sector. The manufacturing industry needs packaging goods to complete the supply chain distribution of manufactured goods from the manufacturer to consumer. The growing population in urban areas encourages the increase of consumer spending which ultimately increases the demand for the supply of packaging goods.

The growth of the production process of the plastic packaging sector in the CoE is affected by the inconsistent energy supply of electricity in South Africa. The research report is focused on the plastic packaging sector of the manufacturing industry, specifically the Mpact plastic packaging factory. There is a lack of literature regarding the distribution of renewable energy in the plastic packaging sector and how policy, investment and technology may be integrated to achieve this. Thus, the researcher extracted primary data from the Mpact packaging factory situated in Wadeville, Germiston in the city of Ekurhuleni to investigate whether incorporating renewable energy, specifically solar power in the energy system can increase production in the factory and can it be applied in the packaging sector. The researcher conducted fieldwork by interviewing a senior manager in the Mpact factory and a senior executive in the energy department in the city of Ekurhuleni. The primary data was analysed with secondary data in the plastic packaging sector trajectories and South Africa's national energy policies. The incorporation of renewable energy as a sustainable energy source in the

energy system of the packaging sector can increase production in the sector, mitigate climate change and reach energy efficiency. The implementation of national policies such as the Integrated Resource Plan, IRP (2018) ensures the industrial sector builds efficient renewable energy technology to incorporate renewable energy within the energy system to generate and transmit sustainable energy for consumption. Mpact's focus on sustainability and environmental conservation has ensured that the Mpact plastic packaging factory reduces energy use for production through installing ancillary equipment for production and their solar roofing energy system that generates sustainable energy. This also includes decreasing the waste-to-landfill sites by recycling used materials to produce new plastic packaging goods as a climate mitigation strategy.

Key words: renewable energy, energy efficiency, energy system, climate change, plastic packaging sector.