# Adaptive Energy Management in Carbon-Constrained Future: The Role of Energy Policy in South Africa

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## Abstract

The role of energy policy in South Africa cannot be underestimated particularly in providing strategic direction and vision to ensure energy development and energy security in a continued carbon constrained future. These policies, strategies and frameworks pursuit sustainability, reliability and economic growth. In essence, there is a need for just energy transition from fossil fuel consumption to renewable energy sources to mitigate environmental pollution and climate change. Just energy transition has a potential role in providing clean energy, creation of local jobs and economic growth. In addition, it also encourages private sector participation in energy developments. Therefore, energy policies have the potential to shape and achieve economic growth, industrial growth and to create decent and sustainable investments while mitigating carbon dioxide emissions. In contrast, policies, and frameworks like Energy Act 04 of 2004, Integrated Energy Plan (IEP), National Development Plan (NDP), Renewable Energy Independent Power Producers Programs (REIPPPP) have played an important role in fostering energy access and energy security. The study methodology used to collect data was through mixed research approach by using qualitative, quantitative research and statistical data analysis. The results show that energy policies have significantly contributed to the rollout of renewables and energy storage. Furthermore, through REIPPPP project Bid (Windows 1 to 4), more than USD 14 billion has been invested by private public partnership which has increased local job creation and reduction in carbon emission. On the contrary, power utility is unable to meet environmental compliance by reducing Sulphur dioxide to acceptable limits and thus poses a risk of 22 GW capacity shutdown by 2030.

## Keywords

Energy Policies, Renewable Energy, Adaptive Energy Management, Decarbonization.