

# Electricity Planning Models, Characteristics and Applications

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## Abstract

This study reviews different computer tools used for planning and modelling power generation. They targeted models are those used to analyse the integration of renewable energy and low carbon sources. Information needed to identify a suitable energy tool for sustainable electricity with integration of renewable energy, storage and smart energy systems is provided. There is no single electricity model tool that addresses all sustainability and other issues related to the transition of the electricity sector and the tools selection and application is a function of specific model objectives to be fulfilled. Various models were identified and reviewed based technologies accounted for, model availability, time parameters used, and previous studies. The paper provides information needed to guide planners in model selection and application to realise sustainable electricity.

## Key Words

Energy models; energy tools; energy systems; renewable energy; sustainable energy.

## Biographies

**Moses Jeremiah Barasa Kabeyi** is currently pursuing his D.Eng. In Industrial Engineering in the Department of Industrial Engineering at Durban University of Technology. He earned his B.Eng. degree in Production Engineering and MSC in Mechanical and Production Engineering (Energy) from Moi University, in Kenya, MA in Project planning and Management from University of Nairobi, in Kenya and Diplomas in Project management, Business management and NGO management respectively from The Kenya Institute of Management. He has worked in various factories including sugar manufacturing at Nzoia Sugar Company Ltd, pulp and paper at Pan African Paper Mills EA Ltd, and power generation at the Kenya Electricity Generating Company (KenGen) in Kenya, in an industrial career of 16 years before moving into teaching. He has taught in various universities in Kenya including University of Nairobi, Technical University of Mombasa, and Egerton University and currently on study leave. His research interests are power generation, fuels and combustion, internal combustion engines and project management and sustainability. He is registered with the Engineers Board of Kenya (EBK) and Institution of Engineers of Kenya (IEK) and has published several journal papers.

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