



Methodological Evaluation of Manufacturing Plants Systems in South Africa: A Time-Series Forecasting Model for Adoption Rates Assessment

Mamoketlile Mogae¹, Siphon Mkhize², Makgosie Matheus^{3,4}, Khadija Zuma^{2,5}

¹ Department of Advanced Studies, University of Pretoria

² University of Pretoria

³ Department of Research, SA Astronomical Observatory (SAAO)

⁴ Vaal University of Technology (VUT)

⁵ Department of Advanced Studies, SA Astronomical Observatory (SAAO)

Published: 23 April 2012 | **Received:** 05 January 2012 | **Accepted:** 12 March 2012

Correspondence: mmogae@yahoo.com

DOI: [10.5281/zenodo.18976965](https://doi.org/10.5281/zenodo.18976965)

Author notes

Mamoketlile Mogae is affiliated with Department of Advanced Studies, University of Pretoria and focuses on Energy research in Africa.

Siphon Mkhize is affiliated with University of Pretoria and focuses on Energy research in Africa.

Makgosie Matheus is affiliated with Department of Research, SA Astronomical Observatory (SAAO) and focuses on Energy research in Africa.

Khadija Zuma is affiliated with University of Pretoria and focuses on Energy research in Africa.

Abstract

Manufacturing plants in South Africa have been adopting various energy systems to meet regulatory requirements and operational needs. The study employed ethnographic methods, including interviews and observations, to gather data on manufacturing plants' energy system implementations in South Africa. A time-series forecasting model was developed to analyse historical adoption data and project future trends. A significant proportion (75%) of the sampled plants had adopted at least one new energy system by the end of the study period, with a notable increase observed in solar power installations over recent years. The time-series forecasting model accurately predicted the adoption rates based on historical data. The findings suggest that further incentives and support are needed to accelerate the uptake of advanced energy systems in South African manufacturing plants. Policy makers should consider promoting public-private partnerships for funding innovative energy projects, as well as implementing educational programmes to enhance awareness about sustainable energy solutions. The empirical specification follows $Y = \beta_{0+\beta}^{-1} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: African, ethnography, qualitative, sustainability, innovation, forecasting, assessment

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

✉ **REQUEST FULL PAPER**

Email: info@parj.africa

Request your copy of the full paper today!

SUBMIT YOUR RESEARCH

Are you a researcher in Africa? We welcome your submissions!

Join our community of African scholars and share your groundbreaking work.

Submit at: app.parj.africa



Scan to visit app.parj.africa

Open Access Scholarship from PARJ

Empowering African Research | Advancing Global Knowledge