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Adjusting Electricity Demand Data to Account for the Impact of Loadshedding in Forecasting Models

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Abstract : The electricity landscape in South Africa is characterized by frequent occurrences of loadshedding, a measure implemented by Eskom to manage electricity generation shortages by curtailing demand. Loadshedding, classified into stages ranging from 1 to 8 based on severity, involves the systematic rotation of power cuts across municipalities according to predefined schedules. However, this practice introduces distortions in recorded electricity demand, posing challenges to accurate forecasting essential for budgeting, network planning, and generation scheduling. Addressing this challenge requires the development of a methodology to quantify the impact of loadshedding and integrate it back into metered electricity demand data. Fortunately, comprehensive records of loadshedding impacts are maintained in a database, enabling the alignment of Loadshedding effects with hourly demand data. This adjustment ensures that forecasts accurately reflect true demand patterns, independent of loadshedding's influence, thereby enhancing the reliability of electricity supply management in South Africa. This paper presents a methodology for determining the hourly impact of load scheduling and subsequently adjusting historical demand data to account for it. Furthermore, two forecasting models are developed: one utilizing the original dataset and the other using the adjusted data. A comparative analysis is conducted to evaluate forecast accuracy improvements resulting from the adjustment process. By implementing this methodology, stakeholders can make more informed decisions regarding electricity infrastructure investments, resource allocation, and operational planning, contributing to the overall stability and efficiency of South Africa's electricity supply system.

Keywords : electricity demand forecasting, load shedding, demand side management, data science
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