

Scientific Tracks

Sustainable developments & environmental science

Marwa Salah EIDin Fahmy

Sadat Academy for Management Sciences, Egypt

Forecasting energy consumption in Saudi Arabia for the period from 2020 until 2030 is investigated using a two-part composite model. The first part is the frontier, and the second part is the autoregressive integrated moving average (ARIMA) model that helps avoid the large disparity in predictions in previous studies, which is what this research seeks to achieve. The sample of the study has a size of 30 observations, which are the actual consumption values in the period from 1990 to 2019. The philosophy of this installation is to reuse the residuals to extract the remaining values. Therefore, it becomes white noise, and the extracted values are added to increase prediction accuracy. The residuals were calculated and the ARIMA (0, 1, 0) model with a constant was developed both of the residual sum of squares and the root means square errors, which were compared in both

cases. The results demonstrate that prediction accuracy using complex models is better than prediction accuracy using single polynomial models or randomly singular models by an increase in the accuracy of the estimated consumption and an improvement of 18.5% as a result of the synthesizing process, which estimates the value of electricity consumption in 2030 to be 575 TWh, compared to the results of previous studies, which were 365, 442, and 633 TWh.

Biography: Marwa Salah EIDin Fahmy did PHD in economics, Sadat academy for management science, 2014, Master's in economics, faculty of economics and political science, Cairo university 2008- Bachelor's in economics by very good with honor, faculty of economics and political science, Cairo university 2003.

fahmy.m.1982@gmail.com

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