

Forecasting the future natural gas demand trends in Nigeria

Falode Olugbenga^{1,2*} and Alo Samuel Folorunsho^{1,2}

¹Department of Petroleum Engineering, Faculty of Technology, University of Ibadan, Nigeria

²Centre for Petroleum, Energy Economics and Law (CPEEL), University of Ibadan, Nigeria

Nigeria has continually relied on its hydro and thermal stations as the main source of electricity generation, with more emphasis placed on thermal generation plants due to the abundance of gas resources. In spite of the abundance of gas resources, it ranked among the list of countries in the world with less access to energy, with percentage of population having access to electricity put at 48.0%. This study used a hybrid model approach combining PEST and ERASME models to analyse the current trend of natural gas consumption and future demand outlook for Nigeria over a ten year medium term. From PEST Model, five (Technical, Commercial, Corporate, Political and Economic) perspectives and four possible straight forward scenarios (Growth, Stability, Emerging and Decline) were also analysed. The ERASME model provided an econometric approach using an Ordinary Least Square Regression analysis with Natural Gas Consumption, as dependent variable against population, economic activities (RGDP), gas price (Power Sector Price and Commercial sector Price) and prices of alternative fuels (LPFO, AGO, and PMS) as independent variables. Natural gas consumption forecast was made based on relative coefficients of variables; the result collated was subjected to Monte Carlo simulation using @ Risk software. The PEST Model analysis showed that natural gas supply capacity was to increase to 10.0bscfd by 2017, from the current 2.5bscfd, which invariably would stimulate increase in natural gas consumption. The Ordinary Least Square regression result showed that natural gas consumption would be driven by, gas price, economic activities, and population. The result from ERASME Model showed that by 2025, the GDP will be N1667.26Trillion, population at 234.23million, while the overall price of natural gas to power factoring inflation is expected to rise to \$8.78Mscf with yearly natural gas consumption increasing to 1204.41bscf respectively. In conclusion, Nigeria gas demand will experience an increasing upward demand trend in natural gas consumption (2015-2025), although certain economic, financial and technology-related factors such as price of natural gas relative to other energy sources, required amount of financial investments in installation of gas power generation plants relative primarily to renewable, nuclear and coal fired plants, transportation costs of natural gas from the extraction facilities relative to other sources of energy, and available gas reserves matter the most in shaping the future gas demand in Nigeria.

Keywords: Electricity generation, ERASME model, natural gas demand in Nigeria, renewable energy