

Investment Opportunity in Renewable and Alternative Energy Value Chain in Gombe State, Nigeria

Nigeria has a vast unmet energy need, with current grid capacity at 5.4GW despite consumption needs averaging 12.9GW per annum. As a result, 74% of the energy consumed in Nigeria in 2019 came from generators. Nigeria's maximum available capacity on the grid is 5.4GW, despite current consumption needs averaging 12.9GW per annum. This capacity constraint, combined with erratic supply to users, results in a per capita consumption of 144kWh, ranking 10th lowest globally. An estimated US \$29Bn in economic productivity is lost annually due to erratic power supply and businesses spent ~US \$14Bn in 2017 on supplemental energy supply according to the Nigerian Rural Electrification Agency (REA)

Hydro Power

Hydropower has been a substantial contributor to Nigeria's grid for a number of decades, accounting for ~20% of total grid supply today. A multitude of river systems, providing a total of 70 micro dams, 126 mini dam and 86 small sites, supply a technically exploitable capacity of 3.5GW, but only 1.7% (0.06GW) of these resources is currently being tapped

Wind Power



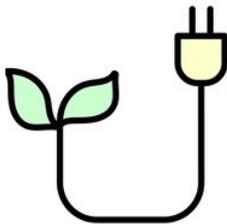
Wind energy potential in Nigeria is modest compared with other technologies, with annual average speeds of about 2.0 m/s at the coastal region and 4.0 m/s at heights of 30m in the far northern region of the country¹

Solar Power

Nigeria has enormous solar energy potential, with fairly distributed solar radiation averaging 19.8 MJm²/day and average sunshine hours of 6.25h/day. The assumed potential for concentrated solar power and photovoltaic generation is around 427GW



Biomass Power



The biomass resources of Nigeria are mainly crops, forage grasses, shrubs, animal wastes and waste arising from forestry, agriculture and municipal and industrial activities. The daily production of animal waste in Nigeria is about 227,500 tons, which could produce ~30% of electricity consumed in the country. And crops such as sweet sorghum, maize, and sugarcane are the most promising opportunities for biofuel production

Challenges facing Nigeria's energy sector

Generation

GENCOs are constrained by inadequate transmission capacity and payment challenges to supply sufficient power to meet consumer demand

Transmission

Low demand intensity in many areas makes cost recovery difficult and outdated transmission infrastructure systems leading to ~40% losses

Marketing

Non-cost-reflective tariffs disincentivize and absence of proper metering and low collection rates pose major financial challenges for DisCos

As a result of challenges across the value chain, customers are classified into 3 categories

ON-GRID (40%) 1

BAD GRID (40%) 2

OFF-GRID (20%) 3

Investment opportunities for investors

MINI GRIDS

Opportunity size

\$3Bn

Provide electricity to a network of households and SMEs, independent of distribution networks. Removes a number of upstream dependencies for power supply compared to on-grid alternatives

Deliver electricity to bad and off-grid customers at an affordable price, with a lower total cost than fossil fuel-based alternatives

SOLAR HOME SYSTEMS (SHS)

Opportunity size

\$3.3Bn

CAPTIVE POWER

Opportunity size

\$8 – 5Bn

Provide on-site electricity to commercial entity/agri-business