



LEGAL AND REGULATORY FRAMEWORK FOR CAPTIVE POWER GENERATION AND BIOENERGY IN NIGERIA

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Outline

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What is Captive Power?

- Under the current framework , “Captive Power Generation” means generation of electricity exceeding 1 MW for the purpose of exclusive use by the generator, and not sold to a third-party.
- Captive power plants are generally used by power-intensive industries such as manufacturing facilities, large offices or data centers where continuity and quality of energy supply are crucial,
- The plants may operate in grid parallel mode with the ability to export surplus power to the local electricity distribution network or in island mode; i.e. independently of the local electricity distribution system
- Captive power today is significant source of power for the Nigeria economy, given that we are yet to **achieved** the desired level of supply adequacy, reliability and quality. Meanwhile industrial electricity tariff are still relatively high due to heavy cross-subsidization.

Legal Framework

- Section 63 (1) of the EPSR Act makes a NERC licence mandatory for any one to engage in
 - Electricity generation
 - electricity transmission;
 - system operation;
 - electricity distribution; or
 - trading in electricity,
- It however exempts captive generation as it is deemed to be for exclusive own use.

Regulatory Framework(1)

- In line with its mandates, in Section 32 of the EPSR Act, to regulate persons engaged in the generation and distribution of electricity, among others, the Commission issued the Regulation No: NERC-R-0108 titled : ***NERC's Permits for Captive Power Generation Regulations, 2008***
- The regulation requires any person wishing to construct, own, maintain, install, and/or operate a captive generating plant to first apply for and obtain a permit issued by the Commission, on such terms and conditions as the Commission may fix in the permit.

Regulatory Framework(2)

Generation of surplus power

- The regulation states that:
 - (a) A Permit holder must apply for, and receive prior written consent of the Commission before supplying surplus power not exceeding 1MW to an off-taker.
 - (b) A Permit holder who intends to supply surplus power exceeding 1MW to an offtaker must apply for a generation licence in compliance with the provisions of Section 62(2) of the Act.

Captive Power Market in Nigeria

- The purpose of captive power plants has moved from back-up use to baseload use.
- Presently there are over 180 captive generation permit holders with a combine capacity of 4087 MW; nearly half of the country's installed on-grid generation capacity. Captive power fuel sources include oil, natural gas, solar, biomass, bagasse and municipal and industrial solid waste
- The manufacturing sector was recently reported to have spent over N67.38 billion on self-generated electricity in 2019
- Liberalization of grid access (open access) is expected to further catalyze the growth of captive generation as it will allow the selling of surplus power to the grid by captive power plants
- Open Access enables heavy users with more than 1 MW connected load to buy power from the open market. The concept is to allow the customers to choose from a number of competitive power companies, rather than being forced to buy power from the local utility monopoly.

Merits & Concerns about Captive Generation

- On a system-wide consideration, captive power enjoys the benefit of
 - Lower fixed cost of electricity delivery, due to proximity to the load centre and hence reduction in the lesser stranded assets
 - reduced transmission and distribution losses
 - Strengthening the grid at multiple points close to last-mile users.
- However the main concerns include:
 - Established utilities (disco) perceive captive plants as having adverse impacts on their finances given that Industrial load is the main source for cross-subsidising revenue flows
 - Billing and collection is much more efficient for HV consumers –
- Owners of captive power are concerned about:
 - Allowing cost reflective tariff structure for surplus power produced by them where they decide to feed excess power to the grid
 - mechanism for risk sharing in case of non availability of fuel, change in variable cost due to switching of fuel after entering into power purchase agreement (PPA),
 - Inadequacies in wheeling and energy storage facilities to support expansion of captive power
 - High wheeling losses assumed for power to be sold to grid by captive power plant

Policy Framework for Bioenergy

- Nigeria's policy objectives in respect of bioenergy as contained in the NEP and NREEP include:
 - reducing the nation's overdependence on oil and gas and consequent environmental threats
 - reduce the country's dependence on imported petrol,
 - reduce environmental pollution
 - creating an industry that is commercially viable to both investors and consumers
 - provide sustainable job opportunities that could reach the common man.
 - Create Wealth and Green Jobs under a Low-Carbon Business Environment and diversify the Economy

Policy provisions in support of Bioenergy

- **National Bio-fuel Policy and Incentives (2007)** contains provisions for Reduced dependence on fossil fuels via fuel blending
- **The National Sugar Master Plan 2012** : production of ethanol and generation of electricity from Bagasse. Existing Sugar companies are expected to anchor the implementation of these plan
- **National RE & EE Policy (2016)** Provided for electricity from biomass residues
- **National Energy Policy (2018)** provides for Efficient and safe use of biomass residues for energy production
- **National Policy on Solid Waste Management (2020)** provides for the use of biomass residues to cover energy needs of agro-industries (in the forms of biogas and bioethanol for power generation)

Regulatory Framework supporting Bioenergy/captive power

- The Feed-in-tariff regulation 2014 (provided for bioenergy power)
- The eligible customer regulation
- Independent Electricity Distribution Network regulation

Potential for mainstreaming Bioenergy into captive power generation

- As a renewable energy, bioenergy resources are widely available, carbon-neutral and has the potential to provide significant employment in the locality. Biomass is capable of providing firm energy.
- The following are examples of a convergence of demand for electricity and bioenergy resource
 - Municipal solid waste, digestible waste from abattoir, industrial processing plants in large cities such as Kano, Lagos, Ibadan
 - bagasse from sugar mills, rice husk, cotton stalk, coconut shells, Vegetable waste, saw dust in peri-urban areas.

Mainstreaming Bioenergy into captive Power generation



Figure 2: Dumping Waste at Landfill



Figure 3: Saw dust at sawmill, Ibillo, Edo state

Sawmills may generate power from the wood residue as captive power to augment grid supply

Commercializing Captive Power

- Under appropriate commercial arrangement, Captive power may contribute significantly to reducing the power supply deficit while boosting productivity. This requires that
- CP producers be permitted to sell excess capacity to third party via dedicated transmission lines or through the disco lines based appropriate distribution use of system charge
- liberalizing the setting up of captive power plant will not only aim at securing reliable, quality and cost effective power but also to facilitate creation of employment opportunities through speedy and efficient growth of industry.
- A large number of captive and standby generating stations in Nigeria have surplus capacity that could be supplied to the grid continuously or during certain time periods.
- These plants offer a sizeable and potentially competitive capacity that could be harnessed for meeting demand for power.
- Grid inter-connections for captive generators should be facilitated on priority basis to enable captive generation to become available as distributed generation along the grid

Recommendation

- Captive generating plants should be permitted to sell electricity to licensees and consumers when they are allowed by NERC
- liberalizing the setting up of captive power plant will not only aim at securing reliable, quality and cost effective power but also to facilitate creation of employment opportunities through speedy and efficient growth of industry.
- A large number of captive and standby generating stations in Nigeria have surplus capacity that could be supplied to the grid continuously or during certain time periods. These plants offer a sizeable and potentially competitive capacity that could be harnessed for meeting demand for power.
- Grid inter- connections for captive generators should be facilitated on priority basis to enable captive generation to become available as distributed generation along the grid.
- A cluster of small and medium scale industries can reduce their energy supply costs by joint ownership of captive generation under appropriate ownership structure
- Efficient expansion of small industries across the country will lead to faster economic growth and creation of larger employment opportunities.

Thanks

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