

ENERGY FOCUS REPORT- SEPTEMBER 2019



A. INDUSTRY HIGHLIGHTS AND GLOBAL TRENDS

NIGERIA

Oil and Gas

- Oil industry's share of digitalization may hit \$1tn by 2025
- NLNG awards contract for construction of Train 7 at Bonny plant
- Nigeria to keep oil-for-fuel swap for at least 3 more years
- FG to deliver 4 key oil & gas projects by Q4 2019
- US Judge rejects Exxon, Shell efforts to revive \$1.8bn arbitration award against NNPC

Power

- NERC releases Minor Review of the MYTO 2015 and minimum remittance order for 2019
- NERC releases Order on the implementation of the Meter Asset Provider Scheme
- FG approves N600bn intervention for Nigeria's power sector

- FG assures Nigerians of increased power generation in four months

Alternative Energy

- Mini grids will address Nigeria's 40,000MW power demands
- FG to deploy solar panels on public buildings
- FG plans to introduce solar powered vehicles
- Renewable energy firms jostle for Generation Companies' power contracts

Environment

- Host communities seek payment of N98bn gas flare penalty funds
- Action groups warn against implementation of Rosatom/Nigeria nuclear deal

B. GLOBAL TRENDS

Oil and Gas

- Ghana's oil production expected to rise to 420,000 bpd by 2023
- Chinese firms look to invest \$1.4bn into African

energy projects

- Equatorial Guinea to build West Africa's first LNG storage and re-gas plants

Power

- Japan, AfDB announce \$3.5bn in support of Africa's power sector
- Siemens signs agreement with EETC for grid studies in Egypt
- India lends \$42m to Zimbabwe to boost access to electricity

Alternative Energy

- Namibia and Botswana look to build 5GW of solar plants over 20 years
- World Bank pledges support for Rwanda's universal electricity agenda
- AfDB approves \$20m for clean energy in Africa

Environment

- US sanctions turn Iran's oil industry into espionage and counterespionage
- United Nations warns Climate change threatens the World's food supply

B. INDUSTRY RISK/OPPORTUNITIES REVIEW SNAPSHOT

S/N	CHALLENGES/ OPPORTUNITIES	HIGHLIGHTS	SOLUTIONS
1.	Gas flare penalty funds	<ul style="list-style-type: none"> Federal Government keeps gas flare penalty sum of N98bn in the federation account Host Communities Association agitate for the disbursement of the sum to the communities affected by gas flaring, in line with international law recommendations Penalty sum was compensation for environmental pollution and degradation of the said communities Likelihood of demonstrations, unrest and asset vandalism by communities, where unresolved 	<ul style="list-style-type: none"> Federal Government and Host Communities to deliberate and agree on favourable resolutions
2.	Exploration of Nuclear Energy (Rosatom/Nigeria deal)	<ul style="list-style-type: none"> Nigeria and Russia (Rosatom) execute an MOU for the exploration of Nuclear Energy in Nigeria Action groups and host communities kick against the implementation of the MOU citing explosion and environmental risks, insufficient capacity and lack of consent from stakeholders 	<ul style="list-style-type: none"> Federal Government and stakeholders to engage in strategic deliberations for a favourable outcome Investment in cheaper, cleaner and safer power supply options
3.	Oil for fuel swap	<ul style="list-style-type: none"> Importation of refined products for the economy 	<ul style="list-style-type: none"> Quick revamping of Nigerian refineries

		<ul style="list-style-type: none"> • Stop-gap measure for domestic refining of fuel products • Creates extended time to restore refineries to full capacity • Investors needed to invest in and upgrade refineries 	
	POWER		
4.	The Minor Review of the MYTO 2015 and Minimum Remittance Order	<ul style="list-style-type: none"> • NERC released the Order for the NESI in August, 2019 to take effect in January, 2019. <p>The implications are that:</p> <ul style="list-style-type: none"> • All accrued financial liabilities arising from tariff shortfalls will be taken off Discos' balance sheets and covered under Power Sector Recovery Plan (PSRP) of the FG • Discos to meter all MDAs within 60 days of the order coming into effect and entrenches the right to disconnect erring MDAs. 	<ul style="list-style-type: none"> • Welcome developments seen in the implementation of cost-reflective tariffs for customers to enable DisCos enjoy reasonable recovery of investment • Outstanding liabilities owed to the DisCos taken off by the PSRP. • Effective implementation of the Order by NERC is required by due date

C. INDUSTRY FOCUS ANALYSIS

WASTE TO ENERGY IN NIGERIA: TRENDS AND OPPORTUNITIES

Introduction

With a projected addition of over one billion people, countries in Sub-Saharan Africa may possibly account for more than half of the growth of the world's population between 2019 and 2050. Parallel to this projection is waste generation, which will also see a similar rapid increase at exponential rates.

A countermeasure to increase in waste generation which had been adopted by some developed countries as far back as 1874 is the construction of waste-to-energy (WtE) plant facilities. WtE involves generating energy in the form of electricity and heat from the primary treatment of waste (renewable energy), especially the non-recyclable components of waste. Simply put, it is the processing of waste into a fuel source as a derivative of the waste management market.

WtE, however, is still a novel concept in Sub-Saharan Africa. The emerging practice saw Ethiopia construct the first waste-to-energy plant in Africa in 2018, as a solution to managing the waste generated in the East African country. In Nigeria, the improper mode of collection and disposal of the massive waste generated in urban areas and megacities is a major challenge. WtE only holds a minimal 6% of the global waste management market; however, its growth will contribute in the fight against astronomical increase in waste generation and disposal.

1.0. THE WASTE TO ENERGY (WtE) VALUE CHAIN

A WtE plant is a waste management facility that combusts wastes to produce electricity. Modern technology has vastly improved the WtE plants in use today, unlike the traditional incinerators and earlier-built plants which were incapable of sorting hazardous waste and recyclable materials or meeting the stringent regulations on emission, before incineration. At the top of the value chain is the security of feedstock supply (biomass, biogenic waste of plants and animals, plastics and petroleum by-products).

The WtE generation plants then utilise the feedstock by

burning them at high temperatures to create thermal energy transferred to a power turbine to generate electricity. Typically, the net electrical energy that can be produced by a WtE plant is about 500 to 600 kWh per ton of waste. Thus, the incineration of about 2,200 tons of waste per day will produce about 1,200 MWh of electrical energy. The generated electricity is then transmitted to the consumers over a transmission network (either through the grid or off-grid).

It is expected that the electricity generated from WtE plants would supplement the power plants predominantly in use in Nigeria, which rely on natural gas as a fuel source. The recent poster child for WtE in Nigeria is the installed 100KVA RDF gasification plant in the University of Nigeria, Nsukka (UNN). The plant, inaugurated in Q1 2019, generates a steady supply of electricity of 100KVA to the university and its nearby communities. This innovation, on scale, has the potential to significantly improve grid and off-grid power availability.

2.0. MARKET DYNAMICS – KEY CONSIDERATIONS

The advantages of implementing WtE plant facilities are numerous, from curbing the massive waste management challenge faced across the nation to supplementing the national grid capacity and providing off-grid solutions to consumers. However, there are key considerations which must be taken into account by potential investors, some of which are discussed as follows:

- Project models and Business risks: WtE projects are capital-intensive with high operations and maintenance costs, and as a result, RE developers might face some challenges with securing bankable projects with consumers willing to pay a premium for 24/7, reliable power. As is common with off-grid projects, investors are typically hesitant because of the absence of proven financial models and associated business risks. Thus, extensive market surveys, feasibility and network studies, and sound financial models are critical to investment in WtE, given its novelty in Nigeria.

Market Demand for Premium Power

- Usually, the rate of demand for premium power might be a disincentive to investment in WtE, particularly as an off-grid arrangement. However, the willing buyer-willing seller arrangement in the Nigerian Electricity Supply Industry (NESI) is beginning to gain traction and investors in WtE projects are assured of existing market demand for premium power. The customer mix to look out for are high-brow residential customers and commercial and industrial (C&I) customers. Investments may be made under the Eligible Customer regime or other off-grid investment opportunities in the NESI.
- Green Solutions: Market segmentation may be further achieved within these customer classes for customers within the C&I space who operate eco-energy-oriented policies in addressing climate change mitigation and adaptation. WtE projects are in essence, environmental solutions to the numerous health and environmental challenges faced in urban areas in Nigeria. They would, therefore address environmental, power supply deficiency and business investment concerns.
- In addition, sustainable waste management projects such as WtE are eligible for green (climate) bonds, which are issued and increasingly favoured

by development and financing institutions. Green bonds are earmarked specifically for the finance of new and existing projects which have positive environmental benefits, contribute to a low-carbon economy and help mitigate climate change.

Technology Transfer incentives

- Investors may also benefit from the pioneer status grant for technology transfer from the National Office for Technology Acquisition and Promotion (NOTAP) in conjunction with the Nigerian Investment Promotion Commission (NIPC). In the promotion of Foreign Direct Investments in Nigeria, investors which import novel WtE technologies for large-scale projects will be eligible for a 5-year tax holiday.
- Security of Supply: The WtE projects are assured of security of feedstock supply given the abundant availability of waste across cities in Nigeria. The country generates over 32 million tons of solid waste annually and Lagos State being the largest city in the country, generates over 10,000 tons of urban waste daily. RE Developers are therefore, certain of steady feedstock supply for WtE projects.
- Contractual Arrangements: Waste collection and disposal is a function undertaken by the government, sometimes outsourced to private



companies. Hence, RE developers must engage with relevant waste management authorities for guaranteed supply of the feedstock for the plant. This can be captured in a Feedstock Supply Agreement (FSA). On the other hand, developers must engage and execute a Power Purchase Agreement (PPA) with target customers. Other agreements are the EPC Contract and O&M contract for the generation plant.

3.0. CONCLUSION

The gradual switch from overreliance on fossil fuels to renewable energy-generated power in Nigeria will create a more sustainable means of electricity generation as well as increase the electricity access rate. With an abundance of waste as a renewable energy source and the pilot project in UNN, it is evident

that investments in WtE projects will prove advantageous to consumers, project developers, the NESI and the entire environment, when captured within a bankable arrangement.

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