

# Power and Internet of Things: Energy Efficiency as catalyst for Technological Innovation and Economic Growth in Nigeria.

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It should be clear to the curious observer that the adoption of technology underpins the growth of large economies across the world. Prior to the sharp economic slowdown that followed the spread of Covid-19 last year, China, India, Indonesia and Poland grew at over 4% in 2019, compared to an average of 1.9% for the 25 largest economies in the world, including Nigeria. While a range of factors were responsible for the superior growth of these economies, the provision of energy and the adoption of technology to create an enabling environment for commerce and enterprise are common themes in their economic strategies.

Indeed, energy efficiency has become the key driver of sustainable development in many countries today. Given the importance of electricity in the application of transformational technology, accessing electric power efficiently is often a deal breaker in the creation of innovative solutions for consumers, businesses, and governments.

Advancements in data collection, internet connectivity and cloud technology are allowing innovators to push boundaries in the delivery of a range of solutions that introduce greater efficiency and comfort to a modern society. These elements are at the heart of the concept of the Internet of Things (IoT), an approach to data gathering and analysis that is changing the world and supporting economic growth.



A desire to adopt transformational technology has been expressed within the private sector and at various levels of government in Nigeria. However, the smart thinking around the generation, transmission and distribution of electric power will often determine the extent of success. This is particularly important in the context of government driven initiatives designed to encourage a culture of innovation.

### **Powering Developmental Ambitions**

The slow pace of reform around a national electrification plan implies that the prospects of getting reliable power supply for industrial and community use remain dim in the short to medium term. Nigeria's power generation capacity is markedly low compared to the estimated demand. A large proportion of Nigerian households connected to the national electricity grid, get little to no power supply and most households and businesses depend primarily on generators for power.

However, some communities are moving ahead with alternative solutions. For example, the Ekiti State Government has engaged the Fenchurch Group, an

Africa-focused Energy, Power, and Infrastructure conglomerate, to build a 5-megawatt Independent Power Plant (IPP) to provide uninterrupted electricity supply to Ekiti State Government facilities and other infrastructure in the state capital, Ado Ekiti. Ekiti IPP will distribute the electrical power generated through a dedicated underground power distribution network to be constructed and owned by the Ado Ekiti distribution company. The project will ensure that uninterrupted power can be distributed to several critical facilities including the state house, government secretariat, the high court, hospitals, secondary schools, and a university.

The ambitions of Ekiti State do not stop at providing electricity for their own exclusive use; electric power is only a piece of the puzzle. The endgame is to establish a knowledge economy frontier as an alternative to Lagos for foreign investors seeking an African hub for tech innovation. According to Governor Kayode Fayemi, the plan is to turn the whole area around the Afe Babalola University into a “knowledge city” that will serve as an innovation hub for medicine, IT and agric-tech.



Further evidence of the state government's determination to create a knowledge city is the signing of a memorandum of understanding with O'odua InfraCo to lay 606km of fiber across the state, a significant investment for a state with 16% broadband penetration. Several other private fiber providers, including MTN, have also started laying cables across the state. However, broadband infrastructure alone will not make Ekiti compete with Lagos. There is no doubt that the internet is capable of spurring rapid innovation, but it was built on another historic innovation: electricity.



### **Getting the Electricity Model Right**

Electricity generation, transmission and distribution models have evolved over the last century. However, grid power and privately generated power present common challenges in relation to their efficiency. In the case of grid power, technical losses due to energy dissipated in the conductors, equipment used in building transmission lines, transformers, sub transmission lines and distribution lines as well as magnetic losses in transformers, are a frequent source of inefficiency. Climatic conditions also pose a real problem especially in rural areas in Nigeria. As for privately generated power, the cost of maintaining generators and related infrastructure can be significant, with the attendant environmental issues of noise pollution and carbon emissions in urban areas.

Modern IPPs address these issues as they provide electricity in a more efficient and clean manner. For example, they are often gas fired as against the use of heavy oil, diesel or petrol in many cases. Independent schemes like the Ekiti IPP are also designed to work continuously with minimal maintenance and are cost efficient in terms of units in the electrical power produced. Fenchurch Power constructs underground distribution lines to ensure service delivery to load centers. This solution minimizes technical losses and interruptions to power supply. It also includes a metering system that facilitates transparency between service provider and client. Ekiti IPP will be supplying power to all load centers via the Ado Power Distribution Company who will construct and own a dedicated underground power distribution network.

The IPP model offers efficient power at a competitive cost to grid power and is as/more reliable than privately generated power. This should be attractive to industrial users. IPP providers like Fenchurch Power are positioned to provide industrial users with efficient and reliable power with gas fired generating engines, solar panels, or a blend of both. In the process, business managers can achieve a significant reduction in their spend on electricity and are able to focus on their core business activities. Sadly, too many businesses are in the business of generating their own power. In the process they spend more than they should and add to the rising carbon emissions associated with industrial activity. Working with IPP providers like Fenchurch Power offers a less stressful, cheaper, and more environmentally friendly approach to energy.

IPPs can support existing grid related power distributors. Due to decades of underinvestment, many distribution companies are stuck with inefficient equipment. IPP and similar power infrastructure providers can offer a helping hand to DISCOs that are willing to partner with them. Fenchurch Power, for example, is in advanced discussions with the a few DISCOs to upgrade their infrastructure. In the process, DISCOs can rejig their model to a more efficient one that opens the door for the franchising of their network, which can only make them more efficient in service delivery and profitable as a business.

Other options for more efficient power in Nigeria include the creation of micro grids in densely populated communities. Working with private sector players, DISCOs can provide stable power to these communities at a competitive price

compared to privately generated electricity. Fenchurch is also engaging the Rural Electrification Agency (REA) to commission solar power projects where the aim is to connect 12,000 homes.

### **Unleashing Innovation with IoT**

IoT is central to generating the intelligence required to leapfrog into the innovation age. It can potentially enhance the quality of life in different areas including medical services, smart cities, construction, agriculture, water management, and energy. In an ideal world, companies want to be able to establish their IoT networks and then forget about the devices themselves, working only with the data they collect.

Future challenges that Nigeria and its industry players will have to address include the supply of the technical capacity and expertise to meet a boom in the IoT-enabled market. Expertise will be needed in the areas of data mining, big data analytics, wireless sensor connectivity and cloud computing, among others. There will also be new challenges relating to policy and regulation.



However, without power, this concept is a non-starter for most companies and utilities. Additionally, the ICT related education that is required to cultivate a youthful techcentric community can only be delivered when universities and other institutions of learning receive reliable electric power supply. Therefore, the integration and optimization of power is one of the most important factors for IoT.



### **An Energy Backbone is Everything**

Energy management and optimization solutions are extremely important for the economic growth of any country and are the backbone on which information and technology systems run. Power is needed to charge IoT devices such as smart cars, smartphones, tablets, and laptops that report or process the information collected by sensors.

The technology offered by IoT promises significant benefits to Nigeria and it should therefore receive the attention of governments at various levels. It will contribute to the achievement of the sustainable development goals articulated by the United Nations and will be integral to any futuristic ecosystem that the authorities hope to create. The world is changing with technology and Nigeria should not be left behind in the evolution. However, getting electricity power solutions right is a critical step on the journey to an innovation driven economy.



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