



**ENHANCE AND EXPAND**

**YOUR WORKING KNOWLEDGE  
IN ENERGY SECTOR**



**DEPARTMENT OF  
MINERALS, PETROLEUM,  
ENERGY ECONOMICS AND LAW**

Faculty of Multidisciplinary Studies,  
University of Ibadan, Ibadan, Nigeria  
Email: [cpeel@ui.edu.ng](mailto:cpeel@ui.edu.ng)  
Phone: 08103279807  
[www.cpeel.ui.edu.ng](http://www.cpeel.ui.edu.ng)



Department of Minerals, Petroleum, Energy Economics and Law (DMPEEL), Faculty of Multi-Disciplinary studies is an offshoot of Centre for Petroleum, Energy Economics and Law (CPEEL) University of Ibadan, Ibadan, a MacArthur Foundation Funded Regional Centre of Excellence.

CPEEL and DMPEEL were designed to strengthen the human capacity in Sub-Saharan Africa energy sector by increasing the pool of energy specialists, teachers, researchers and policy analysts that will initiate, manage and sustain the board reform and manage the transition to an efficient energy sector.

Available Programmes at CPEEL/DMPEEL

M.Sc and Ph.D. (Energy Studies):

- Energy and Environment
- Energy Economics
- Energy Finance
- Energy Policy
- Oil and Gas Economics
- Economics of the Power Industry
- Renewable Energy
- Electricity Economics

LL.M. and Ph.D. (Energy Law)



**NAEE**  
NIGERIAN  
ASSOCIATION FOR  
ENERGY ECONOMICS  
[www.naee.org.ng](http://www.naee.org.ng)

**NAEE Energy Forum** July, 2023

A Publication of Nigerian Association for Energy Economics

**9th Edition**



A Note from the Editor – 5

**The Difficult Transition from State to the Market in the Nigerian Electricity Industry**

*After more than two decades of reform, what has clearly emerged is a failed transition from state to market as evident in the inadequate and unreliable electric power supply delivered to end-users and poor financial performance across the value chain in the industry...*

See pages 7-16

Professor Akin Iwayemi, Ph.D.

Centre for Petroleum, Energy Economics and Law (CPEEL), University of Ibadan, Ibadan, Nigeria  
E-mail: [akinwayemi@hotmail.com](mailto:akinwayemi@hotmail.com)

**Conceptual Analysis of Fuel Pricing: Insights from Economic Theory**

*Fuel subsidy is a very emotional subject in Nigeria. If Nigerians, under age 50 accounts for 70% of the population. It then implies that 70% of the Nigerians alive today have lived all their lives under fuel subsidy...*

See pages 17-24

Professor Adeola Adenikinju

Department of Economics and Centre for Petroleum, Energy Economics and Law, University of Ibadan  
E-mail: [adeolaadenikinju@yahoo.com](mailto:adeolaadenikinju@yahoo.com)

**The State of the Petroleum Industry in Nigeria: Matters Arising and Outlook**

*That the state of the oil and gas industry in Nigeria is wobbly is not conjectural. Neither is there any doubt that the impact of the industry on the overall economy of Nigeria leaves much to be desired...*

See pages 25-30

&

**Diversity, Equity, and Inclusion: A Triad to Energy Sustainability in Africa**

*The universal call to action is very explicitly stated in the "Agenda 2030 for Sustainable Development," which stakes high the humanize energy by 2030...*

See pages 31-33

Omowumi O. Iledare,

PhD, Snr. Fellow USAEE, Fellow NIPetE, Fellow EI, Professor Emeritus, Louisiana State University, Baton Rouge, USA & Executive Director Emmanuel Egbogah Foundation Abuja, Nigeria;  
Former NAAEE President  
E-mail: [wumi.iledare@yahoo.com](mailto:wumi.iledare@yahoo.com)

37 – 2021 - 2023 Council Members

38 – Chairman & Keynote Speaker from 2008-2022

40 – Distinguished Fellowship Award (FNAEE)

43 – 2023 NAAEE/IAEE Conference: LOC

45 – About NAAEE

**Message from the President**



Another year has gone by and, once again, it is time for our Annual Conference. We are pleased to come out with another edition of our Energy Forum. As usual we have excellent articles written by eminent specialists, all of whom are past presidents of this Association. We trust that you will find them full of practical knowledge and insight.

We are pleased that notwithstanding the unexpected disruptions of the past years, we have been able to hold our conferences annually. Even during 2020, which has surely gone down in history as the Year of COVID-19, we are able to hold our Conference, albeit in December. Aply, our theme for that year was Energy and Petroleum in a post-Covid World.

2021 was also dominated by COVID-19, with masks, social distancing and travel precautions characterising the first half of the year. It was also a period of assessment of the impacts that the surreal global environment on countries, and therefore the Association chose the theme: *Strategic Responses of the Energy Sector to COVID-19: Impact on African Economies*. In Nigeria, this was an opportunity to finally adopt a plan to strategically utilise our immense natural gas resources, which had been notoriously flared for decades, and therefore the government launched the Decade of Gas in March 2021. This initiative is aimed and ramping up natural gas utilisation during this decade by increasing domestic gas usage, expanding gas infrastructure, growing gas exports, and attracting foreign direct investment into the gas sector.

Interestingly this launch occurred during a period of growing recognition of the need to drastically slow down emissions causing global warming, and shortly preceded the launch of a seminal report that has fundamentally impacted on the growth of the international energy industry. For years, the global survivalist front burner issue had been climate change and the inexorable downward shift in environmental condition that could render the world inhospitable for future generations. COVID-19 temporarily overshadowed climate change for a short while. As the threat receded, climate change issues became preminent once more, and in May 2021, shortly after the launch of our Decade of Gas, the leading world economies took a major decision to decisively tackle this threat and brought out a blueprint to create a carbon-neutral world. *Net Zero by 2050: A Roadmap for the Global Energy Sector*, a flagship report of the International Energy Agency<sup>1</sup>, was a precursor to the global annual United Nations Climate Change Conference, COP 26, which held in Glasgow, Scotland, in November 2021. The Net Zero Report has since been the focal point of discussions on climate change and the energy industry, irrespective of perspectives or beliefs, and it was also peripherally discussed during our 2021 conference, even as it was asserted that Nigeria would continue to explore its gas reserves up to 2030.

For the 2022 Conference, NAAEE recognised the need to find acceptable African solutions to the global issue of climate change whilst striving to ensure sustainable development of its citizens, and therefore the chosen theme was *Energy Transition and Climate Change Policy: Optima Pathways to Sustainable Development in Africa*.

For 2023, in recognition of the imperative of transition that is appropriate for developing economies, and various recent developments, we have chosen a similar theme,

<sup>1</sup>The Report may be freely downloaded from the website of the IEA, [www.iea.org](http://www.iea.org).

(Continued on page 3)





- ISSUANCE OF LICENSES, PERMITS & APPROVALS ●
- SUPERVISION & MONITORING OF UPSTREAM OPERATIONS ●
- ENFORCING COMPLIANCE ●

# WE ARE NUPRC

ENABLING BUSINESSES AND CREATING OPPORTUNITIES FOR THE NIGERIAN UPSTREAM OIL AND GAS SUB-SECTOR IS OUR PRIORITY.

At NUPRC, our Statutory mandate is to regulate technical, operational and commercial activities in the Upstream Petroleum Valuechain.



## Mission

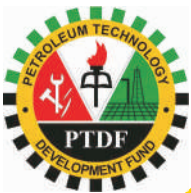
To train Nigerians to qualify as graduates, professionals, technicians and craftsmen in the field of engineering, geology, science and management in the oil and gas industry in Nigeria or abroad.

## Vision

To train Nigerians to qualify as graduates, professionals, technicians and craftsmen in the field of engineering, geology, science and management in the oil and gas industry in Nigeria or abroad.

## The Mandate

To develop the capacity, capability and competencies of Nigerians to play effective roles in the operational and management segments of Nigeria's oil and gas industry. This is achieved through Human Capital Development (Education and Training Programmes), Institution and Systems Development (PTI, NCPSK, University Upgrade Projects, Skills Development and Training Centre, NTI Bonny, Federal Polytechnic of Oil and Gas Ekowe etc), Promotion of Research and Acquisition of Relevant Technologies (Research Grant Competition, Professional Chair Endowments), Manufacturing and Materials Development.



PTDF Tower, Opp. Shehu Musa Yar'Adua Centre,  
Near Silverbird Galleria,  
Central Business District, Abuja

Tel: 234-9-3142216-7  
Fax: 234-9-314229  
Email: [info@ptdf.gov.ng](mailto:info@ptdf.gov.ng)  
[www.ptdf.gov.ng](http://www.ptdf.gov.ng)



NIGERIAN UPSTREAM PETROLEUM  
REGULATORY COMMISSION

[www.nuprc.gov.ng](http://www.nuprc.gov.ng)





## ■ NAAE Energy Forum - 9th Edition

1. Membership shall be accomplished by submission of a written application (by completion of association's membership form) and payment of the first year's dues.
2. Each member shall have one vote, members may vote at meeting of the members in person or by written proxy.

### Membership Dues

- 1a. IAEE Regular Member: \$120
- 1b. NAAE Regular Member: N20,000
- 2a. IAEE Student Member: \$60
- 2b. NAAE Student Member: N10,000
3. Institutional Member: N300,000

### NAEE ACCOUNT DETAILS

Bank Name: Guaranty Trust Bank Plc.  
 Account Name: Nigerian Association for Energy Economics  
 Account Number: 0110538168

Bank Name: First City Monument Bank  
 Account Name: Nigerian Association for Energy Economics  
 Account Number: 1392531018

### WEBSITE

The Nigerian Association for Energy Economics is on the World Wide Web and its address is

[www.naee.org.ng](http://www.naee.org.ng)

The website has general information about the Association. You can also visit our website of the International body at [www.iaee.org](http://www.iaee.org)

Payment can be made online, Membership form can be downloaded from these websites.

Contact: for more information, you can write directly to: Nigerian Association for Energy Economics (NAEE)

President  
 Nigerian Association for Energy Economics (NAEE)  
 c/o Professor Yinka Omorogbe, SAN,  
 SAN, FNAEE, FICMC, MCI Arb. (UK)  
 Tel: 234 8033042184  
 E-mail: [president@naee.org.ng](mailto:president@naee.org.ng)  
[yinka.omorogbe@gmail.com](mailto:yinka.omorogbe@gmail.com)

### Administrative Officer

Nigerian Association for Energy Economics (NAEE)  
 Email: [admin@naee.org.ng](mailto:admin@naee.org.ng)  
 Tel: +234 7 06881 1494

### Nigerian Association for Energy Economics (NAEE) PUBLICATIONS

1. Energy, Environment & Economic growth (2010)
2. Green Energy and Energy Security: Options for Africa (2011)
3. Energy Technology and Infrastructure for Development (2012)
4. Energy Resource Management in a Federal System (2013)
5. Energy Access and Economic Development: Policies, Institutional Framework and Strategic Options (2014)
6. Future Energy Policy Options: Assessment, Formulation and Implementation (2015)
7. Energizing Emerging Economies: The Role of Natural Gas & Renewable Energy (2016)
8. Energy, Economy and The Environment: The Interplay of Technology, Economics and Public Policy (2017)
9. New Era in Global Energy Landscape: Implications for An Emerging Economy (2018).

### Contact Address:

Centre for Petroleum, Energy Economics & Law,  
 Department of Economics, University of Ibadan,  
 7, Parry Road, Ibadan, Nigeria.

### Liaison Office:

4<sup>th</sup> Floor, Right Wing, Plot 979, First Avenue,  
 Abia House, Central Business District, Abuja.  
 Email: [admin@naee.org.ng](mailto:admin@naee.org.ng) or [president@naee.org.ng](mailto:president@naee.org.ng)  
 Website: [www.naee.org.ng](http://www.naee.org.ng)

## ■ NAAE Energy Forum - 9th Edition

Cont'd from cover



**Energy Evolution, Transition and Reform: Prospects for Africa,** in the belief that this covers the various critical issues that we will be interrogating over the two conference days. Whilst some might opine that evolution and transition mean the same thing, in the sense that they refer to a move away from one thing to

another, they are quite different. Evolution is a gradual and natural process, and what was occurring in the earth's atmosphere for as long as its existence, prior to the industrial revolution and the emergence of coal as the vehicle for the massive amounts of engines needed to drive the various industries that arose. With the advent of this and the second and third industrial revolutions (depicted in the chart below), which have primarily been driven by crude oil and natural gas, the gradual evolutionary process was disrupted, leading to the present climate crisis. To stem this, the global solution is not evolutionary, it is transitional, intentionally so, as 'transition' connotes a paradigm shift, planned, and geared towards structural changes that will not evolve without strategic activity. The energy transition signifies a significant change, aimed at rectification of past damage to the environment, as far as it is humanly possible.

Understandably, there are various positions, and the eminent array of speakers will give their perspectives and throw more light. We are hopeful that the deliberations will be a significant contribution to knowledge and understanding of this very important issue.

We are grateful to all our eminent Speakers, who have taken time out of their busy schedules to be part of our Conference. We are fortunate to have His Excellency Dr. Umar Farouk Ibrahim, Secretary General, African Petroleum Producers Organisation, as our Keynote Speaker.

We appreciate all our Student Members. As always, we are so pleased to have many of them in attendance, and as Speakers in the various Concurrent sessions, which are an integral and no-less-important part of our Conferences. The energy from our younger members is exhilarating, and an essential part of our gatherings.

We are proud to say that from inception, NAAE has been able to hold its conferences annually. This constancy has been possible because of the unflinching support and commitment from our members and to them, I owe a debt of gratitude. Our regular Partners have not played a lesser role, particularly the Petroleum Technology Development Fund. They have been a constant rock upon which NAAE has been able to confidently rely on over the past few years. We truly appreciate the Executive Secretary, Dr. Bello Aliyu Gusau FNAEE, for his unflinching commitment to NAAE and its ideals.

I am happy to state that the Nigerian Association for Energy Economics is growing from strength to strength. No doubt it will continue to contribute its quota to the development of the Nigeria's energy industry at this pivotal period in history.

**Prof. Yinka Omorogbe, SAN, FNAEE, FICMC, MCI Arb. (UK)**  
 President,  
 Nigerian Association for Energy Economics (NAEE)



July, 2023



The Nigerian Association for Energy Economics NAAE  
 Prof. Yinka Omorogbe, SAN  
 Nigerian Institute of Advanced Legal Studies, Abuja.  
 Tel: +234 8033042184  
 E-mail: [president@naee.org.ng](mailto:president@naee.org.ng);  
[yinka.omorogbe@gmail.com](mailto:yinka.omorogbe@gmail.com)

Administrative Officer  
 Nigerian Association for Energy Economics (NAEE)  
 E-mail: [admin@naee.org.ng](mailto:admin@naee.org.ng)  
 Tel: 234 7068811494

## NAEE Mission Statement

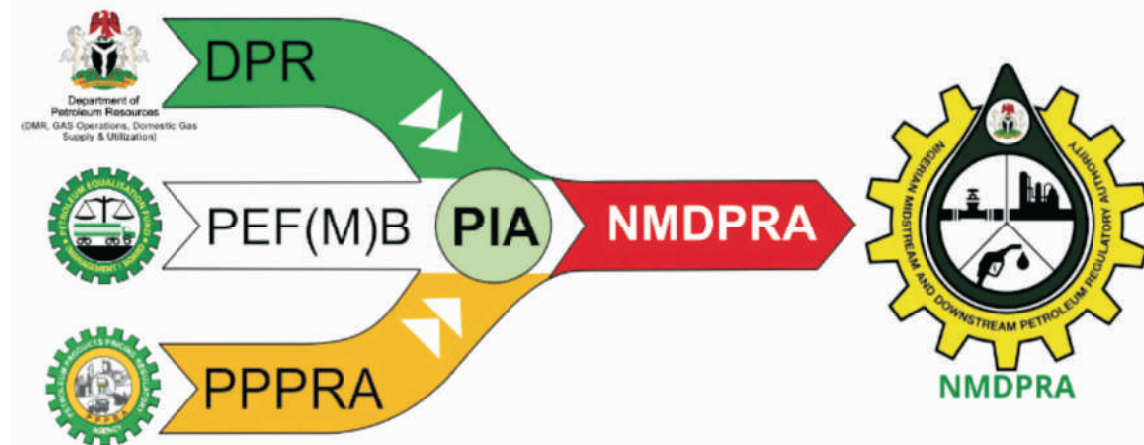
### About NAAE

The Nigerian Association for Energy Economics (NAEE) is the Nigerian affiliate of the International Association for Energy Economics (IAEE) with a presence in over 120 Countries all over the World. The NAAE is however the first and currently the only affiliate of the International Association for Energy Economics in Africa. The NAAE was formally inaugurated in Nigeria in December 2006 at the Nigerian National Petroleum Corporation (NNPC) Towers, Abuja, and one of the fastest growing affiliate in the IAEE.

### Mission Statement

The Association is a nationwide nonprofit organization of business, government, academic and other professionals that advances the understanding and application of economics across all facets of energy development and use, including theory, business, public policy and environmental considerations.





### NMDPRA'S MAIN OBJECTIVES DERIVED FROM THE PIA ARE LISTED AS FOLLOWS:

1. Regulate midstream and downstream petroleum operations, including technical, operational, and commercial activities.
2. Promote a competitive market for midstream downstream petroleum gas operations.
3. Promote, establish, and develop a positive environment for international and domestic investment in midstream and downstream petroleum operations
4. Provide pricing and tariff frameworks for natural gas in midstream and downstream gas operations and petroleum products based on their fair market value of the applicable petroleum products.
5. Grant, issue, modify, extend, renew, review, suspend, cancel, reissue, or terminate licenses, permits and authorizations of midstream and downstream petroleum operations.
6. Improve capacity building for NMDPRA Staff to ensure efficiency in carrying out objectives.

**VISION**  
To be a world class regulator, promoting economic and social development through sustainable energy

**MISSION**  
Enhancing lives through effective regulation of the midstream and downstream petroleum industry.

**CORE VALUES**  
Transparency  
Accountability  
Professionalism  
Integrity  
Innovation  
Teamwork

## A Note from the Editor

I welcome you wholeheartedly to the ninth edition of the Nigerian Association for Energy Economics (NAEE) Energy Forum, the Official Newsletter of the NAEE. The NAEE Energy Forum gives exceptional opportunity for members to disseminate insightful thoughts and reviews across the nexus of the multidisciplinary profession of Energy Economics, Environment, Engineering, Law as well as allied areas. The last edition of the NAEE Energy Forum was in 2022, it was a comeback after the COVID-19 pandemic. In the last eight editions, the public have been treated to articles on current developments in the domestic and global energy industry. This edition, though aligning with the theme of this year's NAEE/IAEE International conference – *Energy Evolution, Transition and Reform: Prospects for African Economies*, also touches on other contemporary energy issues.



On May 29, 2023 President Ahmed Bola Tinubu during his inauguration as the 16<sup>th</sup> president of the Federal republic of Nigeria, 5<sup>th</sup> since the new democratic dispensation that started in 1999, announced the removal of PMS subsidy. Recall that subsidy on Diesel and Kerosene has since been removed as these markets have been deregulated.; market forces of demand and supply now at work. Recall that Government over the years has used subsidy to ensure low energy prices since Udorji era, and to stabilize prices in the economy. Removal of subsidy became necessary as the scheme became unsustainable and the perverse corruption in its administration.

The removal of subsidy has raised several schools of thoughts. However, the immediate effect is the increase in transportation cost, which has eroded the income of the working class, and worsening of the condition of the "working poor". How Government would handle the distributional effects of subsidy removal (PMS and Electricity) is yet to be seen. Government seems to be working on palliatives to ameliorate the negative effects of the subsidy removal, especially as it affects workers, and the installation of alternative energy source like the CNG.

In this edition, two principal authors made contribution to energy price deregulation. Prof Akin Iwayemi look at the difficulty in the transition from the state to the market in the Nigerian electricity industry. The enormity of the adverse economic, social, and environmental effects of the unending electricity service delivery crisis is hardly contestable. After more than two decades of reform, what has clearly emerged is a failed transition from state to market as evident in the inadequate and unreliable electric power supply delivered to end-users and poor financial performance across the value chain in the industry. Prof Iwayemi concluded that when reform is perceived by majority of stakeholders as good politics and good economics, the transition to a more efficient electricity market has a better chance of success. But when they are not in tandem with one another, the gap between policy design and outcome would be wide.

Prof Adenikinju using economic principles to provide a conceptual analysis of fuel subsidy in Nigeria. The paper agreed that there is no simple or universal strategy towards subsidy removal, however, a move towards liberalizing the domestic petroleum market is more likely to succeed under some policy and political environment. He submits that there must be strong confidence building and trust between the government and the



public and the process must be transparent and competitive. Also, good articulation of the reasons for, and the benefits of liberalizing the market. He is in support of a position where the compensatory measures are jointly agreed upon by all the stakeholders, preferably a suite of measures that take care of those in the formal and informal sectors, improvement of the mass transit system, and rural and urban infrastructure development.

Prof Iledare in his paper aimed to highlight the contemporary petroleum issues and policy problems in the oil and gas industry and the prospects that the PIA 2021 and its provisions offer, within the context of the state of the oil and gas industry and the outlook for Nigeria, in time like this. The paper posits that the industry is wobbling in Nigeria, contributing less than 10 percent to the GDP. The paper opined that perhaps the declining industry activities and geopolitical complexity of the global oil and gas business, in the more recent times, have contributed to the wobbling of the petroleum sector in Nigeria. Happily, the Petroleum Industry Act 2021 provided three governing institutions to effectively, efficiently, equitably, and ethically manage the industry for sustainable economic growth and development.

Prof Iledare in another of his paper title "Diversity, Equity, and Inclusion: A Triad to Energy Sustainability in Africa" reiterated that the universal call for Action, which is clearly stated in "Agenda 2030 for Sustainable Development," stakes high the humanize energy by 2030. Energy humanization is the essence of energy sustainability, which ensure households, businesses, and industries have access to available, acceptable, and affordable energy. Humanizing energy within the context of energy sustainability is a strategic priority for African countries as they strive to balance energy security and equity with environmental sustainability. Sustainable energy therefore aims to meet the energy needs of the present generation without compromising the ability of future generations to meet their own energy needs. It involves balancing economic, environmental, and social welfare considerations to ensure that energy end-use is both efficient and effective, and that it does not harm the planet for future generations.

This edition also contains information about forthcoming NAE and International Association for Energy Economics (IAEE) events, reports on activities carried out by the NAE and the IAEE since the last edition, plus adverts from our sponsors and partners. The NAE appreciates our contributors to this and all previous editions. We are grateful for your support and contributions and look forward to continuing impactful collaborations. Suggestions, views, and comments on all aspects of the Newsletter are welcomed. We also welcome articles on energy related issues and any subject of interest to NAE members for publication in the next edition. Articles should be in English using the MS Word (1997-2007) format and Times New Roman font style, font size 12. Text layout should be kept simple, with regular headings, subheadings (where appropriate) and paragraphs. Articles should be in the region of 700-1,500 words; and should include the contributor's name, email address, phone number and affiliation. Pictures may be included in a separate file in JPEG format. Our contact email address is admin@naee.org.ng

.....  
PROFESSOR BEN OBI  
July, 2023

### LIST OF CONTRIBUTORS

#### **The Difficult Transition from State to the Market in the Nigerian Electricity Industry**

PROFESSOR AKIN IWAYEMI, PH.D.  
Centre for Petroleum  
Energy Economics and Law  
(CPEEL), University of Ibadan,  
Ibadan, NIGERIA  
E-mail: [akiniwayemi@hotmail.com](mailto:akiniwayemi@hotmail.com)

#### **Conceptual Analysis of Fuel Pricing: Insights from Economic Theory**

PROFESSOR ADEOLA ADENIKINJU  
Department of Economics and  
Centre for Petroleum, Energy  
Economics and Law  
University of Ibadan  
E-mail: [adeolaadenikinju@yahoo.com](mailto:adeolaadenikinju@yahoo.com)

#### **The State of the Petroleum Industry in Nigeria: Matters Arising and Outlook**

OMOWUMI O. ILEDARE,  
PhD, Snr. Fellow USAEE,  
Fellow NIPetE, Fellow EI,  
Professor Emeritus,  
Louisiana State University, Baton  
Rouge, USA & Executive Director  
Emmanuel Egbogah  
Foundation Abuja, Nigeria;  
Former NAE President

#### **Diversity, Equity, and Inclusion: A Triad to Energy Sustainability in Africa**

OMOWUMI O. ILEDARE,  
PhD, Snr. Fellow USAEE,  
Fellow NIPetE, Fellow EI,  
Professor Emeritus,  
Louisiana State University, Baton  
Rouge, USA & Executive Director  
Emmanuel Egbogah  
Foundation Abuja, Nigeria;  
Former NAE President  
E-mail: [wumi.iledare@yahoo.com](mailto:wumi.iledare@yahoo.com)



## The Difficult Transition from State to the Market in the Nigerian Electricity Industry

\*Akin Iwayemi, Ph.D.

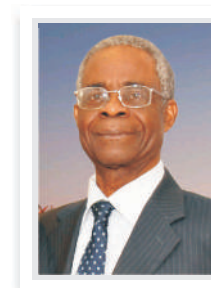
### 1. Introduction and Overview of Issues

The elusive quest to achieve adequate and reliable electricity to consumers is perhaps the most enduring and troubling of Nigeria's development paradoxes (Iwayemi, 2011; Oladosu, 2016).<sup>1</sup> Perhaps also puzzling is the fact that power outages remain widespread despite more than two decades of the most comprehensive reform in the history of the sector.

The enormity of the adverse economic, social and environmental effects of the unending electricity service delivery crisis is hardly contestable. On the macroeconomic side, large output and job losses linked to inadequate and poor electricity service delivery, are estimated to cost the economy about 4% of GDP.<sup>2</sup> The microeconomic costs include decline in profitability of business enterprises and erosion of their cost competitiveness due to high production costs arising largely from the substitution of expensive self-generation for public supply (Adenikinju, 2005). Recently, the Manufacturers Association of Nigeria (MAN), estimated the annual economic loss of their members from poor electricity supply at about N10.1 trillion naira, or about 2% of GDP.<sup>3</sup> For households, consumer welfare and quality of life were adversely affected by the inadequate and poor quality of electricity supply (Oseni, 2016). Also, there are the environmental and health effects of the dependence on millions of standby generators by business enterprises and households in their effort to provide alternative power supply to substitute for poor public supply.

After more than two decades of reform, what has clearly emerged is a failed transition from state to market as evident in the inadequate and unreliable electric power supply delivered to end-users and poor financial performance across the value chain in the industry. But why has sustainable exit from the prolonged and widespread poor electricity service delivery been elusive despite the adoption of the most comprehensive reform in the industry's history? Why has it been difficult to establish and sustain a more competitive electricity industry? Admittedly, diverse factors accounted for the persistence of the electric power supply crisis. However, the poor reform outcomes and the associated high economic, social and environmental costs suggest the need for a better understanding of the factors in the elusive quest to achieve adequate and reliable electricity supply to consumers. Undoubtedly, transiting the economy and society along a new pathway of sustainable, reliable and adequate electricity supply that that is climate change compliant is the grand challenge of the coming years.

There has been some euphoria concerning amendment to the Electricity Act that was recently signed by President Tinubu as a game changer. In my opinion this hardly tackles the core of the crisis which is how to supply adequate and reliable electricity to end users at affordable prices. The amendment mainly deals with decentralizing the governance and regulatory structures in the industry in the context of a federal system of government. Most



\*Professor Akin Iwayemi, Ph.D.  
Centre for Petroleum  
Energy Economics and Law  
(CPEEL), University of Ibadan,  
Ibadan, Nigeria  
E-mail: [akiniwayemi@hotmail.com](mailto:akiniwayemi@hotmail.com)

<sup>1</sup> The grand development paradox is that most Nigerians are poor despite earning over \$500billions from oil and gas exports in more than four decades (See Sala-i-Martin and Subramanian, 2003 and Thomas & Canagarajah, 2002). Three energy-related paradoxes are notable: shortage of oil products and import dependence despite four state-owned refineries and being a major crude oil exporter; shortage of gas supplies to gas-fired power station despite being a leading world LNG exporter; electricity supply crisis despite abundance of domestic energy resource.  
<sup>2</sup> See Foster and Pushak (2011).  
<sup>3</sup> Source is page 17 of the Guardian Newspaper of Friday 16, 2023







state governments that perennially have fiscal problems can hardly deliver electricity to end users at lower cost per kilowatt-hour than through the current supply architecture of generating companies (GENCOs), transmission company of Nigeria (TCN), and the distribution companies (DISCOs). Tackling the problem of transmission is central to sustainable exit from Nigeria's electricity puzzle.

## 2. Electric Power Industry Reform: What We Have Learned from Economic Research

At this point, it is instructive to discuss some key lessons learned from the global electricity reform experiences that started in the late 1980s. Indeed, that many lessons have emerged from the global experience with electricity reform but five will suffice for the purpose of this discussion.<sup>4</sup>

First and foremost, is that the overarching goal of reform which is underpinned by the introduction of market competition where feasible along the electricity value chain is maximization of the wellbeing of the society. Regulatory reforms help to eliminate or minimize the deadweight loss associated with market power of vertically-integrated state or private utilities.<sup>5</sup> The driver for unbundling and privatising public utilities is the quest to ensure delivery of reliable and adequate services to customers, and also to maximize social welfare.

Second, successful industry reform is contingent on the design and implementation of a regulatory mechanism that aligns the diverse interests of the regulator, the consumers, and regulated firm so that a win-win outcome emerges and regulated firms incentivized to supply reliable and adequate electricity at cost-reflective tariff to consumers.<sup>6</sup>

Third is the design and implementation of cost-reflective tariff that will incentivize electricity supply, send the right signal to consumers to use electricity efficiently, and also ensure economic and financial sustainability of the industry.<sup>7</sup> Supply reliability and security are contingent on the pricing that will induce the required capacity addition and minimize supply disruptions.<sup>8</sup>

Fourth, successful reform outcomes require an efficient balancing of the regulated firm's profit objective and the regulator's social objective. Regulatory experiences and market designs are diverse and reform outcomes depend on the political, legal and institutional context.<sup>9</sup> Also, the regulator's independence and credibility are essential for successful regulation.

Fifth, internalizing best regulatory and market design practices involves much learning by doing. Importantly too, reform must be undertaken in the context of a country's political economy and human capital development, and market design should be context-sensitive, minimize opportunistic behaviour associated with information asymmetry and with due cognizance of domestic institutional infrastructure and political economy. Consequently, transplanting advanced regulatory models and processes from a more developed legal and institutional environment to where the institutions are weak is not advisable.

## 3. Electricity Reform: Key Drivers, Characteristics and Outcomes

Electricity industry reform was part of the Obasanjo's government's wide-ranging structural, economic, financial, legal and institutional reforms that came into power in May 1999. However, the policy, legal and institutional frameworks guiding decision making in the electricity sector began in 2001 with the publication of the National Electric Power Policy document which contained the reform agenda in the electricity industry. The motivation for electricity sector reform was driven by several factors that included: poor managerial, operational and financial performance of the state-owned company National Electric Power Authority (NEPA) and its successor, Power Holding Company of Nigeria (PHCN); persistently

low service quality due mainly to low industry productivity and efficiency; the inability of the government to mobilize the huge financial resources needed to fund the huge investment to meet the demand requirement of a growing economy with a large and rapidly growing population; corruption and rent seeking associated with state ownership of the industry; need for private investment to significantly improve boost investment required to reverse poor service delivery and low electricity access.

In 2005, two major developments advanced the reform process in the transition to a more efficient electricity industry. One was the passage of the Electric Power Sector Reform Act (EPSRA). EPSRA is the most radical legislation in the history of the electricity development in Nigeria and effectively signaled Nigeria's participation in the global electricity restructuring and privatization trend. EPSRA provided the policy framework to guide the transition from the grossly inefficient and underfunded state control and ownership to a more liberalized electricity sector dominated by the private sector. The other was the establishment of the Nigerian Electricity Regulatory Commission (NERC) as an independent regulator. Its mandate was to provide regulatory framework that efficiently balances the interests of buyers, sellers (generating, transmission and distribution companies) and investors across the electricity value chain. The Rural Electrification Agency (REA) was also established to promote rural electrification with the aim of scaling up the low electricity access in the rural areas through both grid and off-grid supply. The Rural Electrification Fund was set up to fund expanded rural electricity access.

The privatization the assets of PHCN which began in 2011 was completed in November 2013 culminating in the government selling its assets in generation and distribution to the private sector.<sup>10</sup> The transition to a largely privatized electricity supply system was realized with the unbundling of the state electricity monopoly, PHCN, into eighteen companies with the sale of seventeen of them to private owners and transmission state-owned.

The transition to the market was expected to evolve through four stages. The first stage which commenced after privatization is the interim period. The second stage involves declaration of the Transitional Electricity Market (TEM). To facilitate this stage of the process, the Nigerian Bulk Electricity Trader (NBET) was established in 2013. With the declaration of the Transition Electricity Market, (TEM) by NERC in 2015, NBET became a key player in the market, buying electricity from the generating companies and selling it to the distribution companies. The third stage involves the establishment of the medium-term market when there will be direct trading of electricity between the GENCOs and the DISCOs, through vesting contracts between buyers and sellers of power. The final stage involves the establishment of a spot electricity market with bilateral contracts between electricity buyers and sellers.

Two major reform outcomes in the quest to establish a more efficient market-driven electricity industry are noteworthy. One is the transition from a vertically integrated state monopoly to a diversified electricity value chain dominated by the private sector. This brought more players to the supply side of the Nigerian electricity supply industry (NESI). The unbundling of the state monopoly (PHCN) resulted in three separate segments in the electricity value chain, generation, transmission and distribution with different players in each segment. The generating companies, GENCOs, are owned 80% by the private sector and 20% by the government and the Federal government-owned National Integrated Power Projects (NIPP). Upstream, PHCN was unbundled into six generating companies, namely, Kainji, Shiroro, Afam, Sapele and Ughelli. Also upstream are some Independent Power Producers (IPP) and NIPP a government initiative that involved the construction of ten gas-power generating plants to leverage on the abundant gas supply in the Niger Delta. NIPP is managed by a government agency, the Niger Delta Power Holding Company, (NDPHC). In mid-stream of the electricity value chain is the state-owned, Transmission Company of Nigeria which currently embodies the System Operator (SO), the Market Operator (MO) and the Nigerian Bulk Electricity Trader, NBET. TCN remains a state monopoly. Downstream, PHCN was unbundled to create seven distribution companies owned 60% by the private sector and 40%

<sup>4</sup>The literature on reform in the electric power industry is vast, see Jamasb *et al.* (2017); Newbery (2018)

<sup>5</sup>See Jamasb *et al.* (2017)

<sup>6</sup>See Joskow (2008), and Laffont (2005)

<sup>7</sup>See Newbery (2017).

<sup>8</sup>See Spees *et al.* (2013) and Cramton *et al.* (2013).

<sup>9</sup>See Jamasb *et al.* (2017)

<sup>10</sup>The optimism of the private sector about power sector privatization was evident in 25 bids for the six generating companies (25 bids) and 54 bids for the eleven distribution companies. However, some have alleged the politicization of the final stages of what started as a very robust privatization exercise.



by the government. The eleven distribution companies are Abuja, Benin, Eko, Enugu, Ibadan, Ikeja, Jos, Kaduna, Kano, Port Harcourt and Yola. The current market design is that generating companies sell their electricity to the bulk trader, NBET, which in turn re-sells it to the DISCOs who then retail it to consumers.

The other important development is the transition from administratively determined electricity pricing to a market-oriented electricity pricing in the effort to close the huge gap between the cost of supply to end users and what consumers pay. Lack of cost-reflective tariff has been a major disincentive to investors in the industry for decades. Since the introduction of Multi Year Tariff Order (MYTO) in 2008 electricity tariff has risen sharply in the effort to close the huge price-cost gap. MYTO was designed to cover a 15-year period (2008 to 2023) with reviews every five years and two minor reviews yearly in order to create a relatively stable environment for tariff setting. The new tariff regime has provided a stable and predictable price regulatory framework for key players in marked contrast to the past when tariff was administratively determined. Compared to the past when tariff changes were characterized by uncertainty, the more predictable and stable price environment under MYTO is more conducive to boost investors' willingness to invest in the industry in support of a more competitive electricity market.

#### 4. The Difficult Transition from State to Market in the Electricity Sector

When Nigeria joined the global electricity reform trend by adopting market reform, the expectation was the emergence of a new industry trajectory defined in terms of a significant and sustained improvement in power generation, transmission and distribution services as occurred in many other countries that implemented such reforms. But, more than two decades since the adoption of reform, and about one decade after unbundling and privatization, how has the transition to the new pathway defined by global best practices in electricity supply progressed? The reform effort has brought some notable institutional changes and there are more players (private sector) on the supply side of the market, the consensus based on the unending power outages and poor quality of electricity supply at the end use strongly suggest a failed transition to a more competitive electricity market.

Several observations illustrate the view that the transition to a new pathway defined by global best practices in electricity supply remains elusive despite the adoption of market-driven reform. First, is the poor electricity supply narrative of black-outs and brown-outs that has not changed significantly despite more than a decade after unbundling and privatisation of generation and distribution and billions of dollars of financial support from the Central Bank of Nigeria.

Second, is the weak investment response to sector unbundling, privatization and restructuring. This development has been a major factor in the persistence of power outages. The expectation was that sector reform would catalyse sufficient private and public investment in electricity infrastructure across the value chains that would end the severe shortages in generation and distribution capacities. The weak private sector investment response is a major explanation why sector reform outcome has been minimal. Gross underfunding of the sector due to the weak investment response of privatization and unbundling has ensured that the investment required to improve the availability and quality of electricity delivered to consumers has not been forthcoming. The key players in the sector, GENCOs, TCN and the DISCOs currently lack the financial capability to meet the huge investment requirement required to ensure successful transition to market and restore equilibrium in the sector.

Third is the financial crisis in the sector which has undermined the operational and financial sustainability of the key players in the sector. The financial crisis is highlighted by the inability of NBET to meet its payment obligations to the generating companies, and in turn, the distribution companies' inability to meet their payment obligations to NBET. The sector operators have argued that tariff not rising as fast as costs, and the significant foreign exchange component of their operations have exacerbated their financial challenges. Paradoxically, the sector's financial crisis is occurring at a time when some DISCOs reject power supplied to them despite the huge demand-supply imbalances in their distribution jurisdiction. The high level of financial indebtedness of GENCOs, DISCOs and NBET and uncertainty about future policy direction, have exacerbated the poor investment response and the persistent low productivity in the sector.

Fourth, though the reform was expected to pass on to consumers the benefits of a more competitive electricity market, in terms of lower cost and ultimately lower electricity tariff, this has not happened because of the failed transition to. As a matter of fact, of the four stages envisaged in the transition to the market, only the first two has been achieved. The last two stages of the reform remain suspended.

Fifth, the significant increase in nominal electricity tariff between 2008 and 2023 has not translated into notable improvement in the quantity and quality of service delivery, which remain low. Unsurprisingly, the higher tariff in an environment defined by unreliable and inadequate supply of electricity has provoked strong public opposition in recent years. Attempts by the regulatory agency, NERC, to raise the tariff in the effort to close the significant gap between the price and the cost of supply has often run into strong political headwinds.

Sixth, the establishment of regulatory, institutional and legal frameworks (NERC, NBET, REA) has had marginal impact on reversing the persistence of inadequate and unreliable electricity supply to consumers and low electricity access. Clearly, the establishment of these institutions coupled with sector unbundling, privatization and restructuring have not paid off in terms of the establishment of a more competitive electricity industry. They have not resulted in a significant reduction/elimination of incessant black-outs and brown-outs as occurred in most other countries that implemented market-oriented reforms in electricity sector.

#### 5. Why the Difficult Transition from State to Market in the Nigerian Electricity Sector

Admittedly, diverse factors accounted for the persistence of the electric power supply crisis, but five are considered fundamental in understanding the persistently poor industry performance and finding solutions to the multi-dimensional nature of Nigeria's electricity puzzle.

First is the neglect of the fundamental role of prices in incentivizing producers and consumers to make efficient decisions regarding electricity investment, supply and demand. Prior to 2008 when MYTO became operational, the state-owned electricity company NEPA and its successor, PHCN, charged tariff that did not allow them to earn sufficient profit to finance the huge investment in electricity infrastructure development required to ensure the supply adequate and uninterrupted electricity services to consumers. Indeed, it was not surprising that the required investment and maintenance expenditures needed to solve the inefficient electricity infrastructure system did not emerge. In the post-privatization era, delays in payment of public indebtedness to distribution companies, electricity theft and other forms of corruption are important factors that undermined the sector's financial viability. DISCOs have argued that MYTO is below the level that will allow them to earn a rate of return that will compensate them for the risk in the sector.

Second, is the weak institutional framework and governance failure. Prior to the reform era, political interference in investment decisions, pricing policy, plant location, equipment choices provided weak incentive for the sector to perform optimally operation-wise and financially. The politicization of such decisions also contributed significantly to the sector's inefficiencies. Although, EPSRA significantly closed gaps in institutional and governance frameworks, some challenges remain. For example, though NERC was established as an independent regulator, government influence is still significant though more covert in nature than in the past. The choice and tenure of the NERC's Chairman and the execution of some of its policies has been subject of political interference. Three examples suffice to illustrate this point: the first Chairman of NERC was fired before completion of his term; prior to the 2015 general elections, another Chairman tried to politicize electricity pricing; More recently, finding a substantive Chairman was difficult and current Commissioners in the agency were only appointed after almost two years after expiration of the previous Board. These developments undermine the credibility of the Commission as well as its ability to fully perform its functions.

Third is neglect of political economy considerations in the reform process and industry development. The unbundling and privatization exercise was done during President Jonathan's government and the last stage of the process became controversial. Some have argued that the current chaos in the industry ten years after privatization, may be rooted in the flawed nature of the final stages of the privatization process which coincided with the preparations for the 2015 general elections. Another political





economy issue regarding the persistence of Nigeria's electricity crisis, is the strategic contest between importers and vendors of the highly profitable stand-by generators on the one hand, and the owners of the privatized segment of the sector on the other.<sup>11</sup> Perhaps, the persistence of poor public electricity supply narrative may be indicative of the outcome of the strategic contest between these two players. The final dimension is the political sensitivity of electricity pricing in an environment characterized by populism as occurred under the Buhari government between 2015 and 2023, regime, poor supply narrative and increasing impoverishment of the general population. The political economy of energy pricing in the oil and gas-dependent Nigerian economy has over the decades remained a controversy a politically toxic issue until the recent Tinubu's government.

### 6. Electricity Future that Works

The elimination of Nigeria's electricity puzzle to achieve universal electricity access as a strong anchor for achieving sustainable economic freedom and livelihoods underpinned by low carbon energy technology pathways is faced with several emerging issues and challenges. The way forward must therefore be based on a clear understanding of the nature and scope of the multi-dimensional issues in the design and implementation of a successful transition to a competitive market that is efficient and sustainable.

For the purpose of this discussion, there are several cross-cutting issues that must be examined if the failed transition narrative must change. They include addressing the inadequate and unreliable service, inefficient and unreliable network infrastructure, political economy and security, economic and financial sustainability, regulatory and market challenges associated with information asymmetry, electricity theft and fraud, and accessibility and affordability. The multiplicities of factors that shape the current and future of the Nigerian electricity supply industry and their interlinkages reflect the complexity of the fundamental issues that require attention in the quest to have stable and adequate electricity supply. How to navigate these cross-cutting issues and internalize them to produce a second-generation reform that will achieve adequate, reliable and affordable electricity is at the core of the electricity future that works.

A key element of the strategy for improving industry output and investment performance is implementation of cost-reflective market-based pricing of electricity. Tariff must reflect the long run marginal costs associated with the three segments of the electricity value chain, namely, generation, transmission (high voltage) and distribution (low voltage) and retail. The relevant upstream cost of generation is the marginal cost of generation (fixed capital, operating and maintenance costs and fuel costs). The upstream costs that go into cost-reflective tariff must ensure that those licensed to generate electricity fully recover their costs. Importantly, payments for upstream service delivered must enable the licensed generating companies to earn a rate of return that will make them financially sustainable and attract the size of investment needed to supply adequate and reliable electricity service upstream. The wholesale price in the mid-stream includes the upstream costs and transmission costs. Since this segment of the industry is a natural monopoly, it will be a regulated price set by the regulator and reflecting the real cost of supply mid-stream. Finally, the tariff to consumers should reflect the real cost of supply to the consumer. Hence, across the value chain, prices should signal proper information regarding costs to end users. This is how the expected efficiency gains from a more competitive market in the sector can be realized and passed on to consumers. The regulated cost-reflective tariff that consumers should pay consists as regulated rate of return on generation assets, regulated rate of return on transmission assets, regulated rate of return on distribution assets, and fuel and other operational expenses. Across the value chain, when prices send proper signal regarding the marginal cost of service to end users, the efficiency gains from a more competitive market will be realized and bring to an end inadequate and unreliable electricity supply.

<sup>11</sup> It is estimated that US \$0.5 billion is spent annually on importing generators (Oladosu, 2016).



Often, inadequate electricity supply is rooted in government intervention that prevents or makes cost-reflective tariff adjustment that is necessary to align market supply and demand difficult or slow to achieve. The consequence of such intervention is the supply shortages that over the years produced unending disequilibrium in the sector. Arguably, demand for electricity has increased significantly in recent years due to several factors including economic growth, population growth and subsidized electricity. However, with supply considerably lagging demand, theory tells us that the price should rise to bring up a new equilibrium where the willingness to buy and sell electricity would be aligned. Since investment and production from additional generating, transmission and distribution capacities significantly lag demand, the price would have to increase to provide the incentive for more electricity supply to come to the market to clear the demand-supply imbalance. The short run price increase makes investment in capacity expansion profitable and this will attract investors to build new network facilities to meet the increase in demand. Incentivized by the higher price, supply will increase until a new equilibrium is achieved. Clearly, attracting new investors along the value chain to invest and reliably supply the required quantity of electricity demanded by consumers will be contingent on a credible policy environment underpinned by a regulatory regime of which cost-reflective tariff is an important element. In the long run the new market-clearing price will be lower than the initial price but market output will increase significantly. This is the insight behind the economic proposition that market liberalization combined with unbundling and private sector entry into the electricity sector would result in an increase in output and ultimately in lower tariff. This proposition has been confirmed by empirical evidence in several countries where electricity industry reforms have been pursued with due diligence. Setting electricity tariff below cost-recovery for any extended period of time is counterproductive and will only prolong the elusive quest to deliver adequate and reliable electricity to consumers. Therefore, a commitment to allowing costs to be reflected in the tariff as at when due is a sine qua non for reversing the failed reform story.

Ensuring reliability of electricity service to consumers is another dimension of the emerging challenge associated with the poor quality of electricity supply. One of the reasons why load shedding and quality of supply have defied solution upward of four decades is because of the neglect of the role of cost-reflective tariff in eliminating this problem. When demand rises sharply and exceeds available capacity, load shedding and unreliable supply will emerge due to shortage of available capacity (either generating or transmission or distribution or capacity shortage along the value chain) to meet demand. In general, when demand exceeds supply, power outages and load shedding occur. No market-clearing price exists to balance supply and demand. Capacity addition to bridge the demand-supply gap is required to deal with this predicament. But what will induce the required capacity addition In the literature a suggestion is to price electricity based on the concept of value of lost load (VOLL).<sup>12</sup> To prevent load shedding, investors must be incentivized to invest in supply adequacy and reliability by setting the price that will incentivize the supply of the investment the required capacity addition to close the supply-demand gap and eliminate supply interruptions due to load shedding arising from inadequate capacity. Pricing at VOLL measured by the willingness of consumers to pay to eliminate power outages and their frequencies will provide an efficient solution to load shedding and poor quality of supply. In the debate on pricing, of importance, is the consumer's willingness to pay for reliable electricity supply, a contentious issue in Nigeria and some developing countries, where consumers expect improvement first before paying for it.

The willingness of consumers to pay for uninterrupted and good quality electricity supply is an important issue (Oseni, 2017). The Multi-Year Tariff Order (MYTO) must incorporate in its design a factor to ensure uninterrupted and good quality electricity supply on the supply side of electricity market and efficient use of electricity on the demand side. How to redesign tariff structure to support the growth of a robust and efficient electricity market that balances the interest of consumers on the one hand and generating, transmission and distribution companies on the other is an important policy issue.

<sup>12</sup> VOLL is the average value of the MWh lost by customers during an outage.





Most electricity systems are characterized by a mix of electricity generating technologies. The general pattern is a mix of fossil fuel and renewable energy, with the former dominant. However, climate change concerns have forced most countries to pursue the use of renewables in order to reverse the dominance of fossil fuel technologies in their generation mix. New energy forms (renewables) are making notable entry into the global energy mix and Nigeria is no exception. Off-grid electricity supply based on renewables is the new pathway that government and donor agencies are pushing to meet electricity demand in rural and some semi-urban areas. Hydro-electricity plants and projects include Katsina wind power, 30-MW Gurara 1 in Kaduna state, Mambilla hydro with 3,000MW capacity, the largest power station when it is completed, Zungeru 700MW. Small hydro plants associated with most of the River Basin Authorities but which have not been operational for three decades include 10 MW Tiga and 8 MW Challawa, both in Kano state, 10 MW Oyan in Ogun state, and 6 MW plant in Ikere Oyo state.

The government policy to green the sector is indicated in Renewable Energy Policy. The ambitious policy states that the share of renewable energy in electricity generation mix will increase from 13% in 2015 to 23% in 2025 and 36% in 2030. According to the Nigerian government's 30:30:30 electricity vision, 30% of an estimated 30,000 MW of installed generation capacity will be from renewable energy technologies by 2030. This is certainly an overly optimistic goal given the current narrative in the electricity sector. The government's ambitious plan is in consonance with the United Nations Sustainable Development Goal number 7 which emphasize the need to ensure access to affordable, reliable, sustainable modern energy (United Nations: 2015). However, how to integrate renewables effectively in the energy mix is yet to be addressed holistically in Nigeria. In 2016, the government signed MOUs with fourteen private companies for the installation of 1,125 MW of solar projects at an estimated cost of \$2.5 billion. More than one year after, none of the project has started due to disagreement on the Power Purchase Agreement.

The adequacy of current support mechanisms to ensure renewable energy driven expansion in electricity access and affordability is an important emerging issue in the quest for universal electricity access that is affordable and secure. Admittedly, renewable electricity, based on solar, and wind energy is the new focus of the Nigerian government. In addition, technological development that resulted in significant fall in the cost of setting up renewable energy technologies has made distributed (off-grid) generation more economically feasible than in the past. In fact, the pace of development of renewable energy in Nigeria is comparatively slow benchmarked against African countries such as Egypt, Ethiopia, Kenya and South Africa. Given the government's green development plan that envisages 30% of an estimated 30,000 MW of installed generation capacity will be from grid connected renewable energy technologies by 2030, a more radical view of electricity pricing is required. The feed-in tariff in the current MYTO is an important step in incentivizing the private sector to invest in renewable electricity.

In assessing the competitiveness of renewables generating technologies vis-à-vis conventional fossil-fuel based technologies (natural gas and coal) in delivering affordable electricity to end users in Nigeria, the intermittency of solar and wind must be factored in such comparative analysis since a kWh of electricity produced by a base-load conventional generating station differs from that from solar or wind energy that are intermittent and may not be available when needed because of the variability of solar and wind conditions. Incorporating intermittency and grid integration costs for large scale renewable electricity production will change the calculus of the competitiveness of renewables generating technologies vis-à-vis conventional fossil-fuel based technologies significantly. For off-grid or localized mini-grids, the intermittency issue will still need to be taken care of, possibly through a hybrid system. Therefore, in the determination of system investment strategies it is important that the appropriate metrics are used in the comparative analysis of generating technologies. A final point that is central to a robust development of renewable electricity in Nigeria underpinned by a long-term commitment by the investor to a robust electricity market is to de-risking the industry financially. An important lesson from the developed countries (US, Germany and the UK) with significant share of renewables in electricity is that a long-term commitment by the investor to a robust renewable electricity production is contingent on the scope of the support scheme including feed-in tariff and the

regulatory environment and support at the highest level of government. Synergy between the government (federal, state and local) and the private sector is key for a successful integration of renewable into the electricity supply system, grid or off-grid, to support universal electricity access.

The security of gas to power is essential to stable electricity supply given the dominance of gas in the current electricity generating mix and even into the foreseeable future. Given the devastating impact of gas supply disruption, political resolution of the underlying social conflict in the Niger Delta is critical in minimizing the vulnerability of the power supply to gas supply shocks. In the medium to long term, a more diversified generating mix with distributed generation as an active option should be the preferred option. GSA and PSA still generate controversy between the government and investors. From the social perspective, only GSA and PSA that will maximize social welfare should be accepted by the regulator. Incentive regulation in both gas and electricity industries should be the basis of both fiscal regimes. Clearly, a strategic factor in the quest to achieve sustainable electricity future is adequate investment in gas and electricity infrastructures. Central to ending the huge shortfall in gas and electricity supply is the implementation of Gas Sales Agreement and Power Purchase Agreements that will incentivize the required private sector investment in these infrastructures. However, the government must avoid locking in high prices in these long-term contracts to the detriment of consumers who eventually would have to pay for both the gas and electricity, especially given that the owners of the gas-to power projects want to maximize the return on their investment in the shortest time possible especially in an environment characterized by policy uncertainty such as Nigeria.

Electricity infrastructure investment is a long-term commitment by the investor whether it the government or the private sector. There must be long-term and credible commitment to a sustainable infrastructure and economic future driven by secure economic and political environment. NERC had problems in 2016 in implementing MYTO 2.1 following a court judgement that stopped the process. Yet, the capacity of electricity infrastructure to deliver robust and quality service depends significantly on how the tariff question is answered.

The way forward to a new pathway where supply of adequate and reliable electricity is the norm must eliminate or at least minimize the puzzle-reinforcing factors in the sector. Robust policy design that properly integrates political economy considerations coupled with robust implementation are more likely to close the gap between expectation and outcome in the Nigerian electricity sector. In the design of a second generation of reforms that will eliminate the high social, environmental and economic cost of the 'electricity curse', the focus must be on a reform agenda that will accelerate sustainable and efficient exit from the long tunnel of darkness. Indeed, how to efficiently break out of the current low-level equilibrium trap to a new state that will support sustainable economic growth and development in a society where wealth creation is inclusive and employment yields decent income to workers becomes the new normal is the prime policy challenge in the near to medium term.

Scaling up investment in Nigeria's electricity value chain and attracting new entrants into the sector would require more than tinkering with the existing "flawed" market structure. The grand challenge is to design an incentive structure that will drive efficient electricity infrastructure service provision outcomes. How the core economic and political economy issues in the industry are handled would largely determine the extent to which the transition to the market is likely to succeed or remained stalled. Achieving the efficient and effective utilization of Nigeria's abundant energy resources to provide universal electricity access and serve as a strong anchor for achieving sustainable economic freedom and livelihoods underpinned by low carbon energy technology pathway will be among the prime planning and implementation challenges of the coming decades.

Summing up, a successful transition to a new electricity pathway defined by adequate and reliable electricity supply to consumers is contingent on three factors: establishing an incentive structure that incentivizes investors to invest adequately in network expansion and producers/suppliers to efficiently produce and deliver electricity to consumers, and for consumers to use electricity efficiently; strengthening of institutional and regulatory frameworks to foster sound sector governance and market development; a good understanding of the political economy of industry reform in policy design and implementation.





Clearly, given the high social, economic, environmental and health costs of electricity infrastructure failures in Nigeria, it is obvious that elimination of the electricity paradox to achieve universal electricity access would yield significant positive social and economic payoffs in terms of increased poverty reduction, improved living standards, and the social well-being of the people in the society. Today's choices about how and which electricity is produced, transmitted and distributed to end users will determine the sustainability of Nigeria's future energy system and sustainable development. Pro-actively mainstreaming electricity (and increasingly in its green form) in infrastructure and overall national development planning process should be seen as social, economic and environmental imperatives in achieving the goal of sustainable energy for all.

When reform is perceived by majority of stakeholders as good politics and good economics, the transition to a more efficient electricity market has a better chance of success. But when they are not in tandem with one another, the gap between policy design and outcome would be wide.

### References

Adenikinju, A. (2005) Analysis of the cost of infrastructure failures in a developing economy the case of electricity sector in Nigeria. African Economic Research Consortium AERC Research Paper 148, February 2005 Nairobi.

Briceno-Garmendia, C. & Shkaratan, M (2011) Power tariffs: Caught between Cost Recovery and Affordability, Policy Research Working Paper 5904. Africa Region, World Bank.

Cramton, P., A. Ockenfels and Stoft, S (2013). Capacity Markets Fundamentals, *Economics of Energy and Environmental Policy*, Vol. 2, No 2: 27-46.

Foster, V & Pushak, N (2011). Nigeria's Infrastructure, A Continental Perspective. World Bank. Washington D.C.

Heinrich Boll Stiftung and The Nigerian Economic Summit Group (2017). True cost of electricity: Comparison of costs of electricity Generation in Nigeria Abuja, June

Iwayemi, A. (2008). Investment in Electricity Generation and Transmission in Nigeria: Issues and Options. International Association of Energy Economics, *Energy Forum*, 1<sup>st</sup> Quarter 2008

Iwayemi, A; Diji, C; Awotide, B; Adenikinju, A; & Obutte, P (2014). Towards Sustainable Universal Electricity Access in Nigeria. CPEEL Monograph Series Vol. 1 No. 2. University of Ibadan. Ibadan.

Jamasb, T; Nepal, R & Timilsina, G (2017). A Quarter Century Effort Yet to Come of Age: Survey of Electricity Sector Reform in Developing Countries. *The Energy Journal*, Vol. 38, No 3. Pp. 195-234.

Joskow, P. (2008). Lesson Learned from Electricity Market Liberalization, *Energy Journal 29 (Special Issue)*, 9-42

Laffont, J-J (2005) *Regulation and Development*, Cambridge University Press. Cambridge. UK.

NERC (2015). Feed-in Tariff Regulations for Renewable Energy Sourced Electricity in Nigeria. Abuja.

NERC (2012). The Multi-Year Tariff Order for the determination of the cost of electricity generation for the period June 2012-31<sup>st</sup> May 2017, Abuja.

Oladosu, G (2016). Electricity market Reform in Sub-Saharan Africa and the Power Initiative: The Nigerian Case. International Association of Energy Economics *Energy Forum*: 27-31.

Oseni, M.O (2017). Self-Generation and Households' Willingness to Pay for Reliable Electricity Service in Nigeria. *The Energy Journal*, Vol. 38, No. 4. pp.165-194

Sala-i-Martin, X & Subramanian, A (2003). Addressing the Natural Resource Curse: An Illustration from Nigeria," IMF Working Paper WP/03/139. IMF, Washington. D.C.

Spees, K; Newell, S & Pfeifenberger, J (2013). Capacity Markets - Lessons from the First Decade, *Economics of Energy and Environmental Policy*, Vol. 2, No 2: 1-26.

Tallapragada, PVSN (2009). Nigeria's electricity sector – electricity and gas pricing barriers. International Association of Energy Economics, *Energy Forum*: 29-34.

Thomas, S & Canagarajah, S (2002). Poverty in a Wealthy Economy: The Case of Nigeria. IMF Working Paper WP/02/114. IMF, Washington. D.C.



## Conceptual Analysis of Fuel Pricing: Insights from Economic Theory

\*Adeola Adenikinju

### Introduction

Fuel subsidy is a very emotional subject in Nigeria. If Nigerians, under age 50 accounts for 70% of the population. It then implies that 70% of the Nigerians alive today have lived all their lives under fuel subsidy.

Fuel subsidy was first introduced in Nigeria in 1973 as a palliative measure to cushion the landing cost of petroleum products delivery to refineries following the need to carry out Turn Around Maintenance on them. It has since been used as a social transfer mechanism to ease the burden of high fuel prices on the masses.

Before 1973, the price of petrol was fully determined by the market to reflect costs of crude plus costs of processing of the crude, transportation, and marketing costs, and in some cases, local taxes. Hence, prices of fuel vary across the country, lowest in towns and cities close to the refineries and highest in furthest distances from the refineries. With rising population and growing demand, the burden of sustaining fuel subsidies has been heavy.

In 2011, the government spent \$8.4 billion in gasoline subsidies. An estimated ₦10 trillion is reported to have been spent on subsidy between 2006 and 2018. In 2022 alone, an estimated ₦5 trillion would be spent on subsidy. This has made it difficult for government to have enough revenue to fund the provision of basic social amenities and critical infrastructure.

Over the years, fuel subsidy has moved from implicit subsidy to explicit subsidy. When the refineries were working, barrels of oil were sold to domestic refineries at below international price level, which was an implicit subsidy. However, the dependence on fuel imports over the years, has turned the implicit subsidy into explicit subsidy.

Fuel subsidy has been justified on several reasons: to curtail inflation, promote industrial development and economic growth, it is a privileged or right of Nigerians as oil producers, to promote balanced regional development, and to promote equity.

Over the years, experience and data have not borne the lofty ideas and ideals that underpin fuel subsidy. Rather, subsidy has left Nigeria with the collapse of domestic refineries, collapse of depots and pipelines leaving the country to rely on trucks to transport fuels across the country, widespread corruption along the value chain, macroeconomic and distributional distortions, emergence of multiple agencies to oversee subsidy management, including the Petroleum Products Pricing and Regulatory Authority (PPPRA), and Petroleum Equalization Fund (PEF(M)), and massive fiscal losses and pressure on the exchange rate.

With the current fiscal challenges, it has become very clear that the government can no longer sustain the fuel subsidy, which has gulped over ₦23 trillion between 2004 and 2021. In 2022 alone, an estimated ₦5 trillion was spent on fuel subsidy. This amount was a multiple of the capital budget on education, health, and infrastructure. It was almost equal to the size of the entire FGN revenue for that year.



\*Professor Adeola Adenikinju is the Head, Department of Economics, University of Ibadan. & Former Director, Centre for Petroleum, Energy Economics and Law, University of Ibadan, Ibadan. E-mail: adeolaadenikinju@yahoo.com





Apart from the resistance from fuel subsidy removal from labour, the elites and other beneficiaries of the status quo, there have been so many myths, fallacies and misunderstanding around the debates of subsidy, including how products should be priced, effects of subsidy removal, types of subsidies, and even whether fuel subsidy exists or not. These are some of the issues addressed in this short article. Our objective is very simple, to draw on economic theories and concepts to address some of the fallacies and myths around fuel subsidy in Nigeria.

## 2. Conceptual Issues: Lessons from Economics Principles

### a) Optimal Allocation Mechanism

Economic theory shows that the most efficient allocative mechanism is the market systems. The outcome produced by the market system is superior to any other allocation produced by other allocative mechanisms. This is essentially the outcome of the First Welfare Theorem. The First Welfare Theorem states that a "Competitive Equilibrium is Pareto Optimal". It cannot be dominated by any other allocations. In other words, the market system remains the best mechanism to allocate economic resources.

Even, when for equity reasons, the society is not happy with the income distribution effect of the market system, the Second Welfare Theory argues that the market system should not be displaced, rather, there should be a redistribution of income from the rich to the poor or the disadvantaged to augment the income of the disadvantaged. The **Second Welfare Theorem** posits that if the allocation from the competitive equilibrium is not equitable, social welfare can still be maximized with suitable level of income redistribution. The second welfare theorem supports direct cash transfers to support the poor in the face of fuel subsidy removal. Hence, the two theorems show that the fuel subsidy is not an optimal allocative mechanism, especially, when it is unable to target the poor directly.

### b) Efficient Price determination:

The second conceptual issue we need to address from the point of economics is optimal pricing of commodity, especially, a tradable, exhaustive resource like fuel. According to economic theory, efficient pricing is determined at the point where Price (P) equals marginal costs (MC). Average cost only determines optimum output level, not optimal pricing. Hence, for those equating fuel pricing simply to the average costs of its production, this is an economic fallacy.

The determination of market price is as shown below:

$$P_p = MC \dots \dots \dots (1)$$

The difference between producer price,  $P_p$  and market price  $P_m$  is the role of taxes and distribution margins (DM). Distribution margins include marketing, transportation, and distribution margins.

$$P_m = MC + T + DM \dots \dots \dots (2)$$

Where:

$P_p$  = Producers price

$P_m$  = Market price

T = Taxes

DM = Distribution Margin

Taxes are imposed for different reasons: a) To raise revenue, b) Address environmental pollution, and c) Intergenerational equity.

**Therefore:**

$$T = R + E + Q \dots \dots \dots (3)$$

R = Revenue

E = Environmental pollution

Q = Equity

Energy goods, like fuels, have inelastic demand, and therefore are the most favoured source of generating revenues for the government. This is widely done in the Advanced Economies (AEs) and in Emerging Market and Developing Economies (EMDEs). For instance, Ghana imposed the following taxes on the PMS: excise duties, debt recovery, road fund, energy fund, exploration fund, and cross subsidy for kerosene and diesel. These taxes constitute 20.4% of PMS price in Ghana. For South Africa, the following taxes are added to PMS prices, customs and excise duties, road accident fund, and fuel tax. They account for 27.9% of fuel price. In India, the following taxes are imposed on PMS users excise duties, road access, import tariffs, sales tax, octro/entry tax, education cess and royalties, totaling 23% of fuel price. In advanced countries, the taxes on fuel are even much higher, as seen in table 1 below. However, in Nigeria energy tax is zero, and yet we often like to compare the level of infrastructural development in those countries with the level in Nigeria.

**Table 1: Energy Taxes in Household Energy Prices in Euro Big 4 Economies, 2021**

Euro Big 4 household energy prices, 2021 <span style="float: right;">(\$/toe NCV)</span>					
	Automotive diesel	Premium unleaded 95 RON	Liquefied petroleum gas	Natural gas	Electricity
Tax	1,170	1,418	502	285	1,152
Non-tax	838	886	976	745	2,377
<b>Total price</b>	<b>2,008</b>	<b>2,304</b>	<b>1,477</b>	<b>1,030</b>	<b>3,529</b>
Tax share (%)	58	62	34	28	33

**Notes:**  
Prices partly estimated and preliminary.  
Europe 4 includes France, Germany, Italy and the United Kingdom.  
Data for LPG pricing in the UK and natural gas pricing in Italy is not available (the average of the remaining three is used).

Source: OPEC Statistical Bulletin, 2022.

We need to answer the question "what is subsidy? In the layman's language, it is simply the difference between the price paid by the consumer and the cost of supply. But more formally, subsidy for a tradable energy product like PMS, subsidy is the difference between the market price and the marginal opportunity costs (MOC), where the MOC is the export price (FOB) or the import price (CIF).

The MOC for an exhaustible commodity like fuel, should reflect the costs of production, the user cost (since future generations are deprived of the use of same product) and environmental cost to current generation. The tradable price (export price or import price) captures the MOC. The implicit role of the exchange rate then becomes very important determinant of domestic price for any tradable commodity.





$$P_m = MC + R + E + Q + DM \quad (4)$$

For a tradable good:

MC = export price (FOB) or import price (CIF)

$P_m = \text{Import Price} + T + DM$

The PPPRA template in use before the recent removal of subsidy is the empirical example of the implementation of equation 4 as determined by economic theory.

**Table 2: Typical PPPRA Pricing Template**

No	Cost Items	% Share of items in total
<b>Direct Cost</b>		
1	Cost + Freight	71.9
2	Trader's Margin	1.4
3	Lightering Expenses (SVH)	4.3
4	NPA	0.7
5	Financing (SVH)	0.1
6	Jetty Depot Thru' Put Charge	0.9
7	Storage Charge	3.3
8	Landing Cost	82.8
<b>Distribution Margins</b>		
9	Retailers	5.1
10	Transporters	3.3
11	Dealers	1.9
12	Bridging Fund	6.5
13	Marine Transport Average (MTA)	0.2
14	Admin Charge	0.2
15	Subtotal Margins	17.2
<b>Taxes</b>		
16	Highway Maintenance	
17	Government Tax	
18	Import Tax	
19	Fuel Tax	
20	Subtotal Taxes	
21	Total Cost	100.0

The table shows the cost structure for gasoline in Nigeria. There are three major components: direct cost (costs of crude, costs of refining and freight, port, and storage charges), distribution margins and taxes. In many countries, fuel taxes constitute useful sources of government revenue to fund subsidise public transportation, road construction and road maintenance and to provide social services. In Nigeria, fuel taxes are zero as can be seen in the table.

However, the major criticism against the PPPRA template is that it allows for the transfer of inefficiencies in the petroleum product markets to the consumers. In this regard, there is serious risk of moral hazard as there is no incentive to reduce inefficiencies. The guarantee of fixed margins, demurrage charges, etc. does not allow for competition. In addition, importing refined products appears to be more lucrative than investing in domestic refineries, as the rate of return on the former appears more

favourable than the latter. Full liberalization would allow for competition across margins, and other components of the template.

The implication of the optimal pricing described in equation 4 is that even if local refineries are working, domestic price of fuel should still reflect the MOC, not the average costs of production as non-energy professionals would argue. Otherwise, only public refineries would be operational, and then they would be operating at losses, as has been the case for domestic refineries over the year.

**c) Market Price Adjustments to Subsidy Removal**

The potential impacts of fuel subsidy removal on market prices are also often exaggerated. Market impacts work through the immediate, short-term, medium-term, and long-term. Equilibrium or market price is determined by the forces of demand and supply and not solely by either of them. When subsidy removals are announced, the first reaction is supply responding to the announcement. Hence, in Figure 1, immediately after the announcement of the fuel subsidy removal, prices jump from the subsidized price ( $P_{sub}$ ) to the supply price  $P_s$  on the supply curve. However, that is the immediate reaction of the market. Subsequently, demand factors will kick, marginal buyers will drop out of the market, buyers will look for alternatives, they become more efficient, and adopt other measures that will reduce demand. Over time, more sources of supply will come to the market, that will force suppliers to reduce price. This process will continue until equilibrium Price,  $P_e$  is achieved. Here the equilibrium is stable and unique. It is higher than the subsidized price, but lower than the supply price  $P_s$ . Hence, the initial prices will be seen in the market would not be the final market price.

## Price Determination in a Market Economy

- Competitive price = Demand price and Supply price

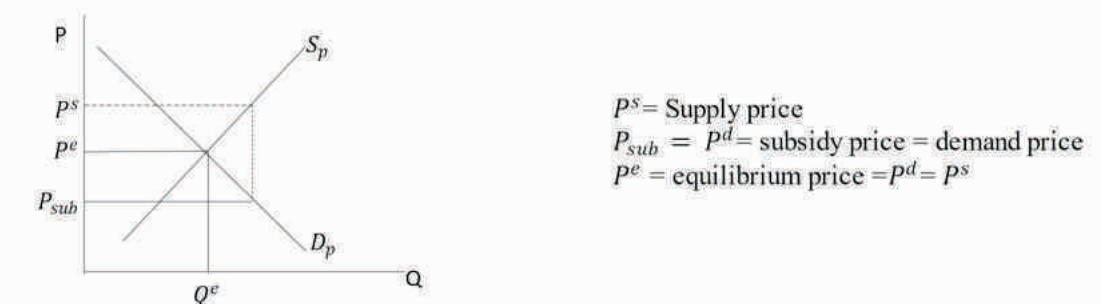


Figure 1: Price determination in a market economy.

Data from transport fares are currently being collected by PiLAF University of Ibadan to measure the response of the transport market to the fuel subsidy removal. The short-term response from transportation fare and behaviors of operators are shown in Table 3 below.



**Table 3:** Indicators of Responses of Transport operators to fuel subsidy removal in selected routes in Ibadan, May – June 2023.

Route	Type of means of Transportation	No of trips per day (Baseline)	No of trips /rounds per day (Current)	Quantity of fuel per round (Litre)	Quantity of fuel per day (Baseline in Litre)	Quantity of fuel per day (Current inLitre)	Transport fare (Baseline in Naira)	Transport-fare (Current in Naira)	% Chg
Ojoo-Bodija	Tricycle	12	6		16	8	150	200	33.3
Ojoo-Oke-Padre	Car	8	4	2.5	20	10	300	400	33.3
Ojoo-Oyo	Bus	2	1	7	8	12	1000	1500	50.0
Ojoo-Iwo-road	Car	8	5		15	15	150	250	66.7
Ojoo-Beere	Tricycle	10	4		12	8	250	300	20.0
Ojoo-Moniya	Car	12	6		20	16	100	200	100.0
Ojoo-Moniya-Akinyele	Motorcycle	15	6		15	12	250	400	60.0
Ojoo - Moniya	Car	8	4		8	3	100	150	50.0
Moniya - Beere	Tricycle	2	1		10	4	300	400	33.3
Shasha - Ojoo	Motorcycle	10	3		4	2	200	300	50.0
Shasha - Ojoo	Motorcycle	10	3	0.5	4	2			
Moniya - Beere	Car	2	1		15	8	300	400	33.3
Shasha - Bodija	Car	8	4	2.5	35	10	400	500	25.0
Iwo-road-Sango, apete	Motorcycle	10	3	5	5		300	400	33.3
Iwo-road-Challenge, tollgate	Motorcycle	11	4	6	6	4	400	500	25.0

Source: Policy Innovation Lab for Agricultural Policy and Food Security, University of Ibadan.

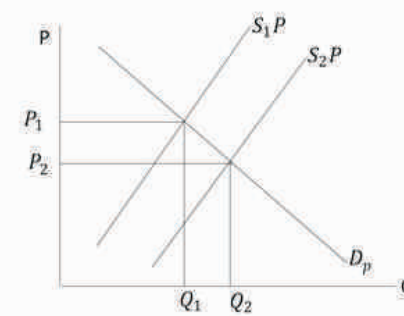
**d) Production Subsidy versus Consumption Subsidy**

One of the common arguments among the proponents of sustaining fuel subsidy in Nigeria is that (1) all countries especially the Advanced Economies provide subsidies for their citizens, and (2) Nigeria is an oil producer. We will address each of these positions seriatim.

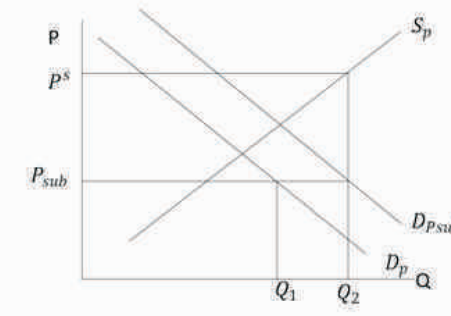
Economic theories inform us that production subsidies are better than consumption subsidies, especially, when the consumption subsidies cannot be properly targeted like the case of the PMS in Nigeria. There is a near consensus that most of the benefits from fuel subsidies goes to the rich and the elites, instead of the poor. Figures 2a and 2b show the differential impacts of consumption subsidy and production subsidy. Production subsidies expand total supply and reduce market price. On the contrary, consumption subsidies expand demand and increase the overall size of subsidies. In the case of consumption subsidy, price is not allowed to reflect the true supply cost, leading to inefficient demand. Removing consumption subsidies will therefore allow efficient demand to subsist in the market.

**Which is better? Subsidising Production or consumption?**

- Producers' subsidy (a) versus Consumers' subsidy (b)



2a) Effects of Production Subsidies



2b) Effects of Consumption Subsidies

On the second argument that Nigeria is an oil producer and should be able to afford fuel subsidy for its citizens, again, data does not support this position. Nigeria average daily production of crude oil in 1970 was 1.083mbd, and 1.323mbd in 2021. The daily oil production in Nigeria in 2021 was almost the same as in 1970, despite the sharp increase in population and economic needs. Table 4 shows the per capita income, per capita oil production in 2021 and per capita oil production from 1970 to 2021. Again, from the data, Nigeria has the lowest indicators in OPEC. This suggests that a poor child cannot copy the lifestyles of a rich family simply because they live on the same street.

**Table 4:** Per capita GDP and Oil Production among OPEC members 1970 to 2021

OPEC	GDP per capita (US\$)	Oil production per capita (barrels) (2021)	cumulative oil production per capita (barrels) (1970-2021)
Algeria	3624.4	7.4	453.3
Angola	2320.9	12.8	467.3
Congo	2245.6	17.1	578.9
Eq. Guinea	8466.7	22.6	1133.3
Gabon	9142.9	31.5	2095.2
IR Iran	2706.5	10.3	916.7
Iraq	5046.1	35.2	1206.3
Kuwait	31488.4	205.0	12000.0
Libya	4835.8	65.8	4597.0
Nigeria	1998.6	2.2	159.8
Saudi Arabia	23478.9	93.8	4554.9
UAE	42705.2	103.3	4135.4
Venezuela	1455.4	7.3	2203.4

Source: OPEC Statistical Bulletin, 2022





**e) Economics of Trade-off**

Opportunity costs is a common term in Economics. Opportunity costs arise because resources are limited relative to needs. Hence, choices that are made are at the cost of alternatives that are forgone. The relevance of this principle can also be applied to fuel subsidy. Between 2006 and Jan-June 2023, government spending on subsidy is around N22.106 trillion naira. In addition, huge amounts of foreign exchange are regularly required to meet the importation of petroleum products, resulting from large scale importation of petroleum products in the light of the inability of domestic refineries to meet domestic demand.



In 2011, the government spent \$8.4 billion in gasoline subsidies. An estimated ₦10 trillion is reported to have been spent on subsidy between 2006 and 2018. In 2022 alone, an estimated N5 trillion was spent on subsidy. This has made it difficult for the government to have enough revenue to fund the provision of basic social amenities and critical infrastructure. Hence, we cannot insist of fuel subsidy and at the same time expect government to provide all the resources needed for social and economic infrastructures.

**Concluding Remarks**

What we have tried to do in this brief article is to use economic theories to shed light on some of the myths around fuel subsidy debate in Nigeria. There is no simple or universal strategy towards subsidy removal. However, several country studies have shown that the move towards liberalizing the domestic petroleum market is more likely to succeed under some policy and political environment. First, there must be strong confidence building and trust between the government and the public. Second, the process must be transparent and competitive. Third, good articulation of the reasons for, and the benefits of liberalizing the market. I am also in support of the current position where the compensatory measures are jointly agreed upon by all the stakeholders, preferably a suite of measures that take care of those in the formal and informal sectors and that also commit to improving mass transit system, and rural and urban infrastructure development.

## The State of the Petroleum Industry in Nigeria: Matters Arising and Outlook

\*Omowumi O. Iledare

**Preamble**

That the state of the oil and gas industry in Nigeria is wobbly is not conjectural. Neither is there any doubt that the impact of the industry on the overall economy of Nigeria leaves much to be desired. The industry currently contributes less than 10% to the Gross Domestic Product (GDP) and this is not necessarily because of any remarkable growth in the non-oil sectors. Perhaps, declining industry activities and geopolitical complexity of the global oil and gas business, in the more recent times, have contributed to the wobbling of the petroleum sector in Nigeria. The good news, however, is the Petroleum Industry Act 2021 (PIA2021), which decreed three governing institutions to effectively, efficiently, equitably, and ethically manage the petroleum operations for sustainable economic growth and development in Nigeria. The aim of this article, first published as an op. ed in the February Edition of the *Value Chain Magazine*, is to highlight, yet again, the contemporary petroleum issues and policy problems in the oil and gas industry and the prospects that the PIA 2021 and its provisions offer, within the context of the state of the oil and gas industry and the outlook for Nigeria, in time like this.

**Contemporary Petroleum Sector Issues**

The global petroleum industry is complex with three specific segments for value creation and additions. These segments are upstream, midstream, and downstream operations. Each of the three segments has unique issues and problems that contemporaneously have implications on the investment outcomes of the other segments. Of course, there are also general issues and problems that are germane to the dreary contributions of the oil and gas sector on the aggregate economic output in Nigeria.

The general issues and problems considered distressful to the oil and gas industry in Nigeria are complexly multidimensional as illustrated in the Charts below. They include but are not limited to transparency and accountability, governance and regulatory ineffectiveness, institutional incompetence, or ineptness. These problems and issues are coupled with rent-seeking, rent-sharing, and prebendal mindsets, and of course, transactional leadership attitudes.



\*Omowumi O. Iledare, PhD, Snr. Fellow USAEE, Fellow NIPetE, Fellow EI, Professor Emeritus, Louisiana State University, Baton Rouge, USA & Executive Director, Emmanuel Egbogah Foundation Abuja, Nigeria. E-mail: wumi.iledare@yahoo.com



<p><b>Revenues</b></p> <ul style="list-style-type: none"> <li>-Declining Production</li> <li>-Drop in prices</li> <li>-Revenue Shortfalls</li> <li>-Leakages</li> <li>-Declining Reserves</li> </ul>	<p><b>Investments</b></p> <ul style="list-style-type: none"> <li>-Funding</li> <li>-Uncertainty in Legal, Regulatory &amp; Commercial Frameworks</li> <li>-Declining competitiveness</li> <li>-Infrastructure deficits</li> </ul>
<p><b>Systems, Structures, People, Tools</b></p> <ul style="list-style-type: none"> <li>-Governance gaps</li> <li>-Delivery capacity</li> <li>-Transparency; Efficiency</li> <li>-Theft and Sabotage</li> </ul>	<p><b>Policy</b></p> <ul style="list-style-type: none"> <li>-Industry Reforms</li> <li>-Open market systems</li> <li>-Subsidization</li> <li>-Participation</li> <li>-Revenue distribution</li> </ul>

Chart 1: The Status of the Petroleum Sector in Nigeria



Chart 2: Contemporary Trends of the Key Industry Indicators, 2009-2019

The interrelatedness of these issues, perhaps, explains the low impact of the industry on the aggregate economic output; though the contribution of the industry to fund the budgets of the three tiers of governance in Nigeria is significant. Thus, what matters is not access to revenue just for political governance but translating huge revenue access to foster a business environment that is conducive for petroleum industry operations with linkages to the non-oil sector operations. The identity equations relating Gross Domestic Product to Private Investment, Government Spending, Household Consumption and Net Export clearly illustrate the point. Unfortunately, if government spending exerts too much influence on the economy, declining government revenue makes the aggregate economy extremely weak. Nigeria offers a classic lesson on how not to spend petroleum revenue in that regards. The more than twenty-year journey to reform the industry was aimed at resolving these petroleum policy issues and problems befuddling the economy of Nigeria.

**Prospects of PIA 2021 on Contemporary Petroleum Policy Issues and Problems**

*Effective and Efficient Industry Governance* – The PIA 2021 created efficient and effective governing institutions, with clear and separate roles for the oil and gas sector. The institutions in the PIA are fashioned to address the governance gaps and improve capacity delivery in a transparent, accountable, and appropriate manner, on time, and in a cost-efficient manner. Two regulatory institutions, the Petroleum Commission, and the Petroleum Authority, have a well-defined mandate to regulate, manage, and monitor upstream operations and the midstream and downstream operations, respectively.

The separation of roles and responsibilities of these institutions needs a re-evaluation in the first 100 days of the new administration. The independence of the institutions is very much at stake, and this is the anchor for efficient, effective, and equitable delivery of the PIA mandates. It is one thing to be endowed with prolific geological and geophysical basins, and it is also fabulous to have a progressive and value-creating fiscal framework. However, optics matter a lot and the perception of investors on the governance of the industry speaks volume in terms of sustainable investments to grow reserves and expand production capacity. Nearly two years after the PIA, these institutions are still quivering and are yet to hit the ground running. Perhaps, this reflects a Ministry of Petroleum Resources with too many proxies serving as Minister of Petroleum Resources mandated in the PIA to set the general policy directions for the oil and gas sector.

*Competitive Petroleum Downstream Market* – The Petroleum Authority tasked with regulating the midstream and downstream petroleum value chain seems not to catch the PIA expectation regarding downstream petroleum operations. Letting go of the pricing regulatory mindsets in the petroleum downstream in Nigeria remains a tradition, despite its illegality. Fixing downstream petroleum products prices is detrimental to the economic efficiency as fully anticipated by the Act. It makes addressing the diminishing investments in the sector difficult and could easily complicate efforts at reversing the declining investment attractiveness and infrastructure deficits in the sector.

Of course, one understands that a "Leopard" cannot change its skin without surgical operations that may take time to heal. There must be a redirection in the implementation philosophy of the PIA 2021, in my opinion, to be in alignment with the competitive intentions of the PIA 2021. The Petroleum Authority must be aware of the anticompetitive behavior inherent in a dominant firm market structure that may likely, following petroleum subsidy removal. In fact, NNPC did exactly that in raising petroleum auto fuel from less than 200 naira per liter to more than 500 naira per liter insolently as a dominant firm in the downstream market. I hasten to say the price was blatantly set above the market clearing price, thereby, inequitably diminishing the market surplus for consumers to enhance its producer surplus.

Additionally, as I have said in many fora, "The prevailing money market disequilibrium with higher demand for forex than supply has literally made the PIA commercial institution a single importer of motor fuels, driven mostly by energy supply security but with a significant cost to the federation account. The Act was intentionally crafted to eliminate the glaring anti-competitive conduct in the petroleum downstream markets. Of course, removing subsidies can be politically burdensome even though it is glaringly unsustainable." But the Act calls for the deregulation of the downstream sector and doing anything else sends a wrong signal to potential investors. Certainly, the recent removal of





petroleum subsidy in obedience to PIA 2021, coupled with the restructuring of the FOREX market structure are laudable.

Removing subsidies is not going to make the economy worse off than it is now or even if it had been removed in 2015 as suggested by many experts, including yours sincerely. The removal of petroleum subsidies will more likely than not rekindle Nigeria economy and perhaps lessens the pressure it has imposed on the forex market. While in the short run the price of motor fuels might rise but it will stabilize in the not-too-distant future. The removal would be just a temporary shock with a short adjustment process subject to foreign exchange stability and the Dangote refinery becoming operational as scheduled. The laws of demand and supply work even under changing market conditions, its functionality is not static but dynamic.

**Reversal of Declining Revenue Path** – Unquestionably, the declining trend in upstream petroleum revenue is in the conscious awareness of every Nigerian. The key determinants of revenue declining trend are contemporaneously linked to upstream production, crude oil price volatility, system leakages, and insecurity. Producing the OPEC allocated quota remains quite challenging because of oil theft and institutional inefficiency. Unfortunately, Nigeria started rather late to leverage on its natural gas reserves accordingly and appropriately, despite the laudable natural gas policy framework adopted in 2017. The established good natural gas program initiated by the immediate past president is worth adopting. Don't destroy good foundations in the oil and gas sector, instead build on them. However, do not hesitate to let adding value to the sector be the key motivation in your decision-making process to reverse the declining petroleum revenue trend. Listen, learn, and lead not with political expediency prime movers but competent professionals. Passed on policy recommendations from your political appointees for the sectors to professionals who are literally and supposedly be your eyes, ears, heartbeats on petroleum industry and the sector matters. Professional appointees for the sector must be genuinely apolitical for value creation and they must not be transactional but transformational.

However, let us state the obvious, reversing the declining revenue trend and diminishing industry value in the short run will be a tall order because the PIA 2021 fiscal framework emphasizes more on delayed revenue extraction mechanism than early revenue extraction in the upstream sector. This makes a lot of sense as competition for upstream investments has become keener under the emerging energy transition era with many more oil and gas producing countries emerging by the numbers in pursuit of investments to develop the black gold. Additionally, the PIA 2021 fiscal framework is more favorably disposed to deep offshore contractual upstream arrangements than the prevailing concessionary upstream arrangements in the shallow water and onshore terrains, which traditionally offers more revenue to the government because of JV operations and a relatively high Petroleum Profit Tax. Further, though a progressive royalty scheme surfaced in the PIA 2021 for the deepwater terrains, exempting the terrains from resource taxes dampens the revenue outlook for the federation. This is worrisome and renders the original intention of a dual tax system suboptimal in performance.

Preliminary studies suggest that government access to revenue may also shrink in the short run, unless output expands in response to the fiscal generosity offers in the PIA 2021 for new assets as well as converted assets. The rising technical cost must also diminish. Interestingly, too, the interpretation of the transformation of NNPC to NNPC in the PIA with respect to federation assets it holds, does not help in arresting the declining government revenue from upstream asserts. Again, hope is not lost. The new administration must let go of political expediency as mentioned earlier, as the key driver underling policy decisions with aggregate and national economic implications, including appointments to agencies and departments in government institutions. The historical tradition of asking NNPC to spend money on behalf of government is counterproductive in this regard and must discontinued outright and perhaps with an executive order.

We understand that the process leading to the commercialization of NNPC, and the framework anticipated for its sustainability. It is imperative to note that commercialization is not synonymous with privatization. Paraphrasing, one of the objectives stated in Chapter One of PIA 2021 within the context of industry governance and institution is to establish a framework to create a commercial institution christened as NNPC Limited in the PIA, as a national petroleum company. The commercial institution so created shall be commercially oriented and profit driven. Dear, Mr. President, there is nothing that says a national oil company unless privatized cannot be profit oriented. We have great

examples of profit-oriented national petroleum companies worldwide. However, a reappraisal of the created framework, which established NNPC is highly recommended to bring it back to focus and to avoid crowding out the petroleum industry operational space with diseconomies of scale. Perhaps, that framework created after PIB 2020 became PIA 2021 needs surgical operations to realign the national petroleum company with the framers' intentions.

**Host Communities' Challenges** – The optimal pathway to sustain prosperity in the petroleum host communities and enhance direct social and economic benefits from petroleum operations in the communities remains tenuous. Nearly, every instrument, NDDC, Ministry of Niger Delta, Amnesty programme, 13% derivation fund, devised by the federal government to enhance peaceful and harmonious relationship between operators and host communities has fully worked. Perhaps, because of agency theory, whereby those engaged to deliver, cater for themselves first before the host communities. It is not surprising that these instruments are perceived as indirect benefit from petroleum operations in the communities. No Laws or Act should be perpetual. Some of these Act need proper reevaluation to add value to the communities.

Thus, the philosophy behind getting the community to articulate and prioritize projects is innovative in the PIA 2021 and reflects a reward mechanism to the communities as legitimate stakeholders in petroleum resources development. Because the relationship among the stakeholders—communities and operators are predetermined, the framers of Chapter III of the PIA made mutuality of interests the cornerstone of the host communities fund. Posterity is critical if prosperity is to be sustained; thus, the allocative structure of the fund is well defined to keep the future in view. Additionally, such relationships demand effective communication, cooperation, and responsibility of stakeholders to improve security of infrastructure and enhance peace in the community. The relationship is not opportunistic and the benefits accruing to stakeholders cannot be justified based on the motives of the individual stakeholder. Optimizing mutuality of interests is key to enhancing security of assets and workers.

**The Policy Institution Quandary** – The powers of the Minister of Petroleum can literally be interpreted as the functions of the Minister of Petroleum in the PIA. Unfortunately, no institution is established by PIA to facilitate the effective deliverability of the PIA mandates for the Minister. Some may argue that the Ministry of Petroleum Resources is the institution to support the functional responsibilities of the Minister.

An evaluation of the immediate past eight years makes it plausible to argue that the support base for the functional responsibilities of the Minister of Petroleum has been the presidency, to a large extent. This constitutes the big quandary that bedeviled the policy process in the petroleum sector lately as well as the general policy supervision over the affairs of the petroleum industry. As mentioned earlier, there are just too many proxies of the Minister of Petroleum Resources on this subject matter. I hasten to insinuate that the lackluster impact of PIA 2021 on the sector is consequential to the dilemma in defining the institutional base of the Minister of Petroleum Resources with respect to discharging its PIA mandates. Thus, and I stand corrected, that only but a few petroleum policy directives have been issued and published in the Gazette, if at all any, in accordance with PIA 2021 Part II, Sections 4 and 5.

The essentialness for a competent policy institution to facilitate proper execution of the powers of the Minister of Petroleum enacted in Part II, Section 3 of the PIA 2021 is not conjectural. Unfortunately, as things stand now, the Ministry of Petroleum Resources is structurally deficient, technically inept, and managerially incompetent to support the Minister in the exercising of the powers mandated in the Part II of PIA 2021. Interestingly, the success of PIA 2021 anchors on three separate but equal institutions—policy, commercial, and regulatory, with a well-defined complementary role.

Unfortunately, the institution mandated to formulate, monitor, and administer government policy in the petroleum sector is the weakest link in terms of technical capability, structural effectiveness, and organizational efficiency. Yet, the Commission and the Authority must comply with policy directives issued by the Minister on upstream petroleum operations and midstream/downstream operations, accordingly.

The dependency of the Minister on technical assistants drawn from different institutions of government or industry players to exercise the power of the Ministers limits policy continuity and sustainability





from one administration to the other. The powers of the Minister of Petroleum mandated in the PIA 2021 requires competent technical and managerial professionals to facilitate easy acceptance of and compliance to ministerial directives to the Commission and the Authority. Such professionals and managerial staff must not be inferior in competency levels and compensation to professionals and managerial staff in the Commission and the Authority because of mutuality of interests. It is imperative to restructure the Ministry of Petroleum accordingly, in alignment with the petroleum industry structure—upstream, midstream, and downstream and the departmental and/or divisional units in the commercial and regulatory institutions.

### Summary and Concluding Remarks

That the current state of the oil and gas industry in Nigeria is bothersome is not conjectural. Neither is there any doubt that the impact of the industry on the overall economy of Nigeria leaves much to be desired. The general issues and problems distressing the oil and gas industry in Nigeria are multidimensional. The good news, however, is the Petroleum Industry Act 2021, which provided three governing institutions to effectively, efficiently, equitably, and ethically manage the industry for sustainable economic growth and development. The PIA framers understood the essentiality of good governance, transparency and accountability, progressive royalty framework, efficient tax system, and relational peace and security in the host communities.

The implementation of the Act is going on steadily, though not without some hitches and apparent deviations from the intentional framing of some of the provisions in the Act, to resolve some of the issues and challenges limiting the deliverability of the petroleum sector potential to create and add value to the national economy. Unfortunately, the needle seems not to be "threading the cotton" fast enough to ameliorate the governance issues in the oil and gas sector. A review of the process is recommended.

Of course, we sincerely and perfectly understand that any advice given may not necessarily be acknowledged. Let us, however, for posterity offers one or two, anyways. The governance of the oil and gas industry is more complex than the rent-seeking and rent-sharing political empire, called Nigeria. The industry remains the engine to propel the economy of Nigeria to prominence. Thus, it requires full attention of a dynamic and functional Minister of Petroleum to correctly lead the industry in alignment with the intentions of the PIA2021 inventors. The dwindling fortune of the industry over the last decade offers good lessons on how not to govern the oil and gas industry in the emerging energy transition era. So, please avoid the temptation to hold on to the Minister of Petroleum portfolio as enacted in the PIA 2021.

The second piece of advice is on the dependency of the Minister of Petroleum on technical assistants and advisors drawn from different institutions of government or industry players to exercise the power of the Minister. The powers of the Minister of Petroleum as mandated in the PIA 2021 requires competent technical and managerial professionals to sustain institutional memory of Ministerial decisions from one administration to another. It is, therefore, imperative to restructure the Ministry of Petroleum accordingly, in alignment with the petroleum industry structure and the departmental and/or divisional units in NNPC, the Commission, and or the Authority with competent and adequately rewarded personnel. The powers of the Minister of Petroleum as mandated in the PIA 2021 requires competent technical and managerial professionals to sustain institutional memory of Ministerial decisions from one administration to another. It is, therefore, imperative to restructure the Ministry of Petroleum accordingly, in alignment with the petroleum industry structure and the departmental and/or divisional units in NNPC, the Commission, and or the Authority with competent and adequately rewarded personnel.



## Diversity, Equity, and Inclusion: A Triad to Energy Sustainability in Africa

\*Omowumi O. Iledare

### Preamble

The universal call to action is very explicitly stated in the "Agenda 2030 for Sustainable Development," which stakes high the humanize energy by 2030. Energy humanization is the essence of energy sustainability to ensure that households, businesses, and industries have access to available, acceptable, and affordable energy. Humanizing energy within the context of energy sustainability is a strategic priority for African countries as they strive to balance energy security and equity with environmental sustainability. Sustainable energy therefore aims to meet the energy needs of the present generation without compromising the ability of future generations to meet their own energy needs. It involves balancing economic, environmental, and social welfare considerations to ensure that energy end-use is both efficient and effective, and that it does not harm the planet for future generations.



### Energy Sustainability Triad

Achieving energy sustainability requires a transition towards a more diversified, inclusive, and equitable energy system. However, the way we produce and consume energy can have significant impacts on the environment, such as climate change, air pollution, and habitat destruction. These impacts can have negative consequences for human health, natural ecosystems, and the planet's overall ecological balance.

Further, energy sustainability requires a shift in societal attitudes and behavior towards energy use, such as adopting energy-efficient habits and embracing more sustainable lifestyles. Africa cannot, however, attain energy sustainability at the detriment of energy security and environmental sustainability. Thus, diversity, equity and inclusion are a critical strategic triad for Africa to optimally humanize energy for economic development in the global energy transition and net-zero-emissions expedition.

**Energy Diversity:** Energy diversity is the use of a variety of energy sources to meet our energy needs. These energy sources must include renewable sources such as solar, wind, hydroelectric, and geothermal energy, as well as non-renewable sources such as oil, gas, and coal. Energy diversity is an important and a critical factor in achieving energy sustainability. A diverse mix of energy sources can help to ensure a stable and reliable supply of energy, while reducing environmental impacts and promoting technological innovation without propelling energy crisis.

Relying on a single energy source, such as fossil fuels, can lead to energy insecurity, as these sources are finite and subject to supply disruptions and price volatility. By contrast, a diverse mix of energy sources, including renewable sources like solar, wind, and hydro, can help to ensure a more secure and stable energy supply. For example, there are some parts of Nigeria, where provision of electricity connection to the national grid is extremely difficult.

\*Omowumi O. Iledare, PhD, Snr. Fellow USAEE, Fellow NIPetE, Fellow EI, Professor Emeritus, Louisiana State University, Baton Rouge, USA & Executive Director, Emmanuel Egbogah Foundation Abuja, Nigeria. E-mail: wumi.iledare@yahoo.com





These places can be provided with electricity using renewables such as solar and wind. Energy diversity can also help to reduce the environmental impact of our energy use. Fossil fuels, for example, are a major source of greenhouse gas emissions, which contribute massively to climate change. By shifting to a more diverse mix of energy sources, including renewables, we can reduce our greenhouse gas emissions and other forms of pollution, which can improve public health and protect natural ecosystems.

Finally, energy diversity can promote innovation and technological development in the energy sector. By investing in a range of energy sources, we can foster competition and encourage the development of new technologies that can improve the efficiency, reliability, and affordability of our energy systems. This can ultimately lead to more sustainable and resilient energy systems that can meet the needs of future generations. Overall, energy diversity is a key component of energy sustainability, and it is important that we continue to promote the use of a wide range of energy sources to meet our energy needs in a sustainable and responsible way.

**Energy Equity:** Energy equity encompasses fair distribution of energy resources, burdens, and benefits among diverse groups in society, regardless of their level of income, geographical location, or race. Energy equity is essential for achieving energy sustainability and meeting the United Nations SDGs, particularly Goal 7 to ensure access to affordable, reliable, sustainable, and modern energy for all. This simply implies that everyone, regardless of their socioeconomic status, race, gender, or geographic location, should have access to the energy they need to meet their basic needs and improve their quality of life. Energy equity aims to ensure that all individuals and communities have access to reliable, clean, and affordable energy sources, and that they are not disproportionately impacted by negative effects of energy production and consumption. Accessibility to cost effective energy is a fundamental human right, and we must work to guarantee that all communities have the energy they require to power their lives.

Africa must guarantee that the advantages of our energy systems are distributed equitably to address energy poverty. This is essential for promoting energy equity, as everyone should have access to energy, they need to meet their basic needs. Without energy equity, certain communities may not have access to affordable and reliable energy sources, which can put them at risk of energy insecurity. This can lead to a range of negative consequences, including increased economic hardship, reduced quality of life, and compromised health and safety. Unfortunately, many people, particularly those in low-income and marginalized communities, lack access to modern energy services, relying instead on traditional and often inefficient and unhealthy sources such as biomass, kerosene, and diesel generators. Many people around the world lack access to modern energy services, with as many as 789 million people still without access to electricity, according to the International Energy Agency. Thus, energy poverty is often concentrated in rural areas and in low-income households in both developing and developed countries. Lack of access to energy services can limit opportunities for education and economic advancement, contribute to health problems and environmental degradation, and exacerbate social inequalities.

Achieving energy equity requires addressing several challenges, including energy poverty, improving energy infrastructure in underserved communities, and promoting the use of clean and renewable energy sources. This can involve expanding access to electricity and clean cooking fuels, investing in renewable energy, improving energy infrastructure, and promoting energy-efficient technologies. Policies and initiatives that promote energy equity can include expanding access to affordable financing for energy improvements, increasing investment in energy infrastructure in low-income and marginalized communities, supporting community-based energy projects, and promoting energy efficiency and renewable energy technologies. The massive ability to utilize petroleum to expand energy access lays the fundamental foundations to embark on industrialization, which drives economic growth and development.

**Energy Inclusion:** The third element of the triad, energy inclusion, conceptually, seeks to ensure that everyone has access to affordable, available, and acceptable energy services, and that their energy needs are considered in the design and implementation of energy policies and programs. It goes beyond just providing access to energy services and encompasses the participation and engagement of

communities in decision-making processes related to energy. Energy inclusion is important because energy is a basic human need, and lack of access to energy services can limit opportunities for economic development, education, and social well-being, especially for the vulnerable ones in society. Moreover, vulnerable, and marginalized communities are often disproportionately affected by energy poverty, energy insecurity, and the negative impacts of energy use on health and the environment.

The International Renewable Energy Agency asserts that less than 50% of households with people with disabilities have access to electricity. Furthermore, people with disabilities tend to have greater energy requirements since they require assistive devices which are powered electronically for independent functioning. Nevertheless, there is a perception that energy demands of people with disabilities are less important than other competing needs in terms of access to energy. Due to these challenges, people with disabilities are more likely to be vulnerable to energy inefficiencies such as the use of inefficient energy, excessive energy expenditures, poor health care and inadequate educational requirements.

Achieving energy inclusion requires addressing the underlying drivers of energy poverty and energy injustice, such as inequality, discrimination, and social exclusion. This requires a multi-dimensional approach that addresses not only access to energy services but also energy affordability, energy efficiency, energy conservation, and the use of clean and renewable energy sources. The Sustainable Energy for All Action Plan framework has influenced energy policies and report projects across a variety of demographics. Policies and initiatives that promote energy inclusion can include community-led energy projects, engagement, and consultation with local communities in the development and implementation of energy policies, energy efficiency programs that target low-income and marginalized communities, and financial assistance programs for energy improvements. Additionally, these energy inclusion policies and initiatives can include promoting energy democracy, expanding access to information about energy systems and services, and investing in capacity-building programs that empower marginalized groups to participate in energy decision-making processes. These approaches can help to ensure that energy decisions are made in a way that is inclusive, participatory, and equitable, and that everyone has a say in shaping their energy future. Overall, energy inclusion is an important component of a just and sustainable energy system, and it is important that we work to ensure that everyone has access to the energy they need, and that their voices and needs are heard and considered in energy decision-making processes.

### Conclusion

Nigeria's geometric decline in daily oil production from 2.2 million bpd in 2015 to 1.7 million bpd in 2018 and 1.3million (bpd) in 2022 can be attributed to the declining trend in diversity, equity, and inclusion (DEI). Perhaps illegal oil bunkering, corruption, vandalism among others is just a collateral factor apparent fall in DEI. So, how can we strike a balance between the triad of energy sustainability in Africa? There are no easy answers but to employ a variety of tactics. Substantial investments will be required in renewable energy, energy storage, grid infrastructure, and other technologies. The workforce must be diverse, equitable and inclusive. Human capital development and deployment must be optimal, inclusive, and just. Doing things right and in the right way is essential in workforce development and deployment.

Finally, petroleum is not going to just disappear into the thin air. Technology to fulfill low carbon in the production and consumption of petroleum can help as well. Africa is not running out of petroleum, and I do not see petroleum being excluded from the optimal energy mix to enhance sustainable energy elements—availability, acceptability, accessibility, and affordability. Thus, using petroleum wealth management tools to facilitate the linkages necessary for the petroleum sector to propel emerging African economies is critical to absorb the unintended consequences of a rapid energy invocation on African economies. Africa economies need to not walk the loud energy transition talk, precipitously. Invoking the triad of energy sustainability—diversity, equity, and inclusion--to avert energy crisis is laudable.





# Amazing Proof@the 15<sup>TH</sup> NAEI/IAEE ANNUAL INTERNATIONAL CONFERENCE

Theme: **Energy Transition and Climate Change Policy: Pathway For Sustainable Development In Africa**  
July 17th-19th, 2022  
@PTDF Conference Auditorium, 2 Memorial Drive, Central Business District, Abuja

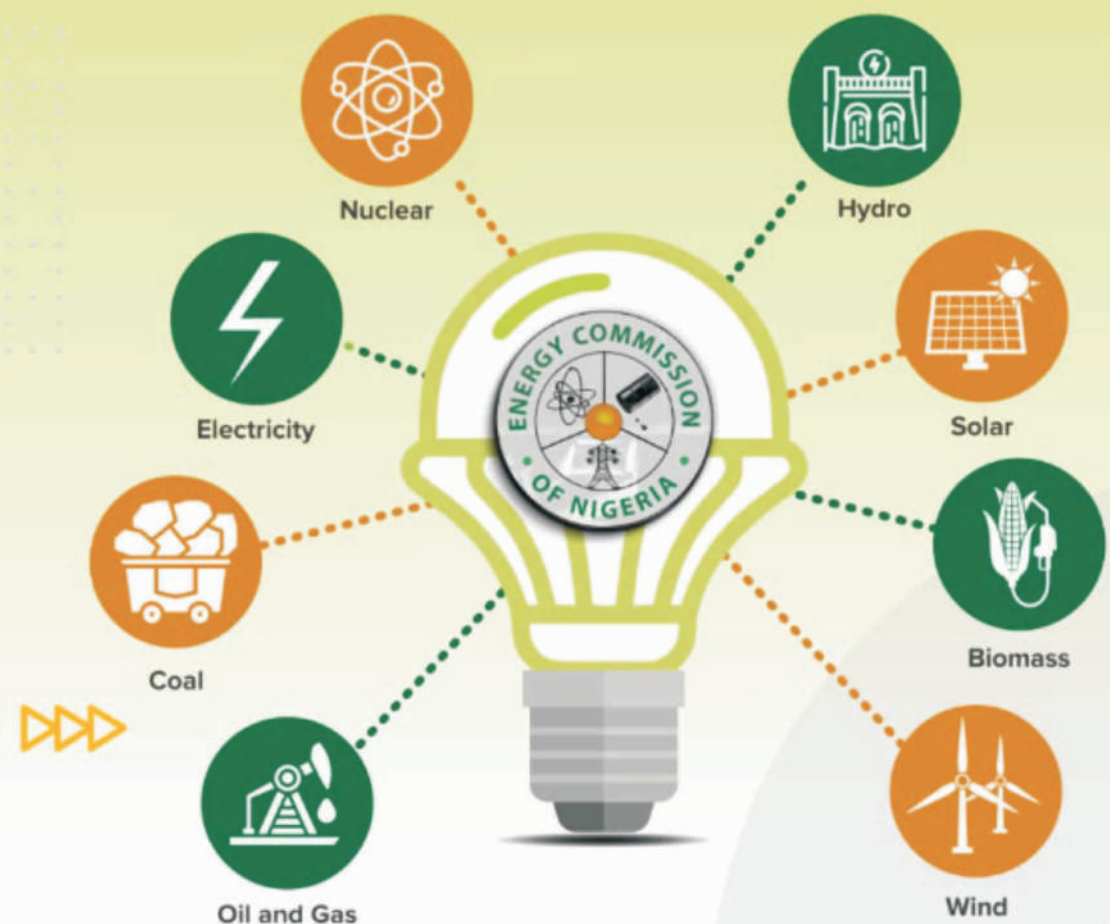






# ENERGY COMMISSION OF NIGERIA

Coordinating National Energy Policies  
towards Energizing the Nation



@Energygovng

A Production of  
Energy Commission of Nigeria

[www.energy.gov.ng](http://www.energy.gov.ng)

## 2021 - 2023 COUNCIL MEMBERS

President  
**Professor Yinka Omorogbe, SAN**  
*Nigerian Institute of Advance Legal Studies (NIALS),  
Abuja*

Immediate Past President <b>Professor Wumi Iledare</b> <i>Executive Director, Emmanuel Egbogah Foundation (EEF), Abuja</i>	Vice President (Conferences & Publications) <b>Professor Ben Obi</b> <i>Department of Economics, University of Ibadan, Abuja</i>
--	---

Vice President (Membership and Liaison)  
**Mrs. Priscillia A. Ekpe**  
*Nigerian Midstream & Downstream Petroleum Regulatory  
Authority, NMDPRA-Abuja*

Treasurer <b>Dr. Margaret Hilili</b> <i>Central Bank of Nigeria (CBN), Abuja</i>	Secretary <b>Engr. Ere Iyalla</b> <i>Petroleum Technology Development Fund (PTDF), Abuja</i>
--	--

Assistant Secretary  
**Ms. Priscilla Okowsha**  
*NNPC, Lagos*

Public Relation Officer (PRO)  
**Mr Isihak Salisu**  
*NNPC, Abuja*

Auditor <b>Engr. Amina Danmadami</b> <i>Nigerian Upstream Petroleum Regulatory Commission Abuja</i>	Legal Adviser <b>Dr. Terhemem Andzenge</b> <i>Fmr. Director, BPE, Abuja</i>
---	---

Student Representative  
**Osise Okwilagwe**  
*Centre for Petroleum Energy Economics and Law (CPEEL),  
University of Ibadan*

### Ex- Officio Members

<b>Dr. Hassan Mahmud</b> <i>Central Bank Nigeria (CBN), Abuja</i>	<b>Professor Uche Nwogwugwu</b> <i>Nnamdi Azikiwe University, Awka</i>
--	---

**Mrs. Folashade Oje**  
*Presidency, Abuja*

Editor  
**Dr. Obindah Gershon**  
*Covenant University, Canaanland, Ota*

### Council Advisers

**Professor Akin Iwayemi**  
*Centre for Petroleum Energy Economics and Law (CPEEL),  
University of Ibadan*

<b>Professor Adeola Adenikinju</b> <i>Centre for Petroleum Energy Economics and Law (CPEEL), University of Ibadan</i>	<b>Mr. Jide Adebulehin</b> <i>Petroleum Technology Development Fund (PTDF), Abuja</i>
--	--

<b>Dr. Tim Okon</b> <i>TENO Energy Ltd, Abuja</i>	<b>Ms. Oge Modie</b> <i>Presidency, Abuja</i>
--	--





## CHAIRMAN AND KEYNOTE SPEAKER OF EACH OF THE PAST NAAEE CONFERENCES IN NIGERIA, 2008-2022

CONFERENCE	THEME	KEYNOTE SPEAKERS	CHAIRMAN	DATE AND VENUE
1st Annual Conference	DEVELOPING AND SUPPORTING CRITICAL ENERGY INFRASTRUCTURE FOR VISION 2020: CHALLENGES, CONSTRAINTS AND PROSPECTS.	CHIEF P. C. ASIODU, CON	Ambassador Baba Gana Kingibe, former Secretary to the Federal Government of Nigeria	29th-30th April, 2008. Transcorp Hilton Hotel, Abuja.
2nd Annual Conference	ENERGY INDUSTRY: RESTRUCTURING INTERACTIONS BETWEEN BUSINESS, ECONOMICS AND POLICY	Dr.Taiwo Idemudia, former Head, Economic Section OPEC	Engr. Mutiu Sunmonu MD, Shell Petroleum Development Corporation of Nigeria	23rd-24th April, 2009. Sheraton & Towers, Abuja.
3rd Annual Conference	ENERGY, ENVIRONMENT AND ECONOMIC GROWTH	Prof. A.S. Sambo, FNAEE, Director General, Energy Commission of Nigeria and Special Adviser to the President on Energy	Dr Emmanuel Egbogah, Former Special Adviser to the President of Nigeria on Petroleum Matters.	19th - 20th April, 2010. New Chelsea Hotel, Abuja.
4th Annual Conference	GREEN ENERGY AND ENERGY SECURITY: OPTIONS FOR AFRICA	Mr. OstenOlorunsola, former Vice President, Gas, Shell Africa, former Director, DPR	Engr. Chimalbenechie, former Honourable Minister, NLNG	28th – 29th April, 2011. Sheraton Hotel & Towers, Abuja,
5th Annual Conference	ENERGY TECHNOLOGY AND INFRASTRUCTURE FOR SUSTAINABLE DEVELOPMENT.	Professor Einar Hope, 2010 IAEE President	Prof. A.S. Sambo, FNAEE, Director General, Energy Commission of Nigeria and Special Adviser to the President on Energy	23rd – 24th April, 2012. Abuja Sheraton Hotel, Abuja.
6th Annual Conference	ENERGY RESOURCE MANAGEMENT IN A FEDERAL SYSTEM: CHALLENGES, CONSTRAINTS AND STRATEGIES".	Chief Philip Asiodu, CON, Former Minister of National Planning	Dr Emmanuel Egbogah, Former Special Adviser to the President of Nigeria on Petroleum Matters	22nd-23rd, April, 2013. Sheraton Hotel, Lagos.
7th Annual Conference	ENERGY ACCESS FOR ECONOMIC DEVELOPMENT: POLICIES, INSTITUTIONAL FRAMEWORK AND STRATEGIC OPTIONS	Professor Yinka Omorogbe, Nabo Graham Douglas Distinguished Professor of Law, Nigerian Institute of Advanced Legal Studies (NIALS), Abuja.	Professor Chinedu O. Nebo, Ph.D, OON, NPOM Honourable Minister of Power, Federal Republic of Nigeria.	16th -18th, February 2014, Sheraton & Towers, Abuja.

CONFERENCE	THEME	KEYNOTE SPEAKERS	CHAIRMAN	DATE AND VENUE
8th Annual Conference	FUTURE ENERGY POLICY OPTIONS: ASSESSMENT, FORMULATION AND IMPLEMENTATION TRENCHARD HALL, UNIVERSITY OF IBADAN, IBADAN, NIGER	Austin O. Avuru, FNAPE, MD/CEO, SEPLAT Plc	Dr. Emmanuel Egbogah, OON, P. Eng. Chairman, Emerald Energy Resource &, Former Special Adviser to the President on Petroleum Matters	26th- 28th, April, 2015, Trenchard Hall, University of Ibadan, Ibadan, Nigeria
9th Annual conference	ENERGIZING EMERGING ECONOMIES: THE ROLE OF NATURALGAS & RENEWABLE ENERGY	His Excellency, Professor Yemi Osinbajo, SAN, GCON, Vice President, Federal Republic of Nigeria, Abuja	Dr. H. Odein Ajumogobia SAN, Former Honourable Minister of External Affairs and Honourable Minister of State for Petroleum Resources, Federal Republic of Nigeria	24th – 26th April, 2016. Sheraton Hotel & Towers, Abuja.
10th Annual conference	ENERGY, ECONOMY AND THE ENVIROMENT: THE INTERPLAY OF TECHNOLOGY, ECONOMICS AND PUBLIC POLICY	Dr. E. Ibe Kachikwu, Honourable Minister of State for Petroleum Resources, Abuja	Dr. E. Ibe Kachikwu, Honourable Minister of State for Petroleum Resources, Abuja	23rd-26th April, 2017. PTDF Conference Centre, Abuja, Nigeria.
11th Annual Conference	NEW ERA IN GLOBAL ENERGY LANDSCAPE: IMPLICATIONS FOR AN EMERGING ECONOMY	Mr. Austin Avuru, CEO, SEPLAT Petroleum Development Company PLC	Engr. Funsho Kupolokun (Director, First Ally Capital Limited	22nd-24th April, 2018, PTDF Conference Centre Abuja, Nigeria.
12th Annual Conference	ENERGY EFFICIENCY AND ACCESS IMPERATIVES FOR SUSTAINABLE DEVELOPMENT IN EMERGING ECONOMIES	Engr. Funsho M. Kupolokun, Director, First Ally Capital Limited	Professor James A. Momoh, Nigerian Electricity Regulatory Commission	14th-16th April, 2019. PTDF Conference Centre, Abuja, Nigeria,
13 <sup>th</sup> Annual Conference	"ENERGY AND PETROLEUM IN A POST-COVID WORLD"	H.E. Chief Timipre Sylva, Honourable Minister of State for Petroleum Resources	H.E. Chief Timipre Sylva, Honourable Minister of State for Petroleum Resources	17 <sup>th</sup> December, 2020. PTDF Conference Centre, Abuja, Nigeria.
14 <sup>th</sup> Annual Conference	STRATEGIC RESPONSES OF ENERGY SECTOR TO COVID-19 IMPACTS ON AFRICAN ECONOMIES	H.E. Mohammed Sanusi Barkindo, OPEC Secretary-General	H.E. Chief Timipre Sylva, Honourable Minister of State for Petroleum Resources	25 <sup>th</sup> July, 2021. PTDF Conference Centre, Abuja, Nigeria.
15 <sup>th</sup> Annual Conference	Energy Transition and Climate Change Policy: Pathway for Sustainable Development in Africa	Mr. N. J. Ayuk Executive Chairman, African Energy Chamber	Professor Eli Jidere Bala Director General Energy Commission of Nigeria	17 <sup>th</sup> -19 <sup>th</sup> July, 2022 PTDF Conference Centre, Abuja, Nigeria.





## DISTINGUISHED FELLOWSHIP AWARD (FNAEE)

	Name	Organisation	Year of Award
	Prof. A. S. Sambo	Former Director General, Energy Commission of Nigeria	2010
	Name	Organisation	Year of Award
	Prof. A.O Adegbulugbe	Former Special Adviser to the President on Energy Matters	2010
	Name	Organisation	Year of Award
	Prof. Akin Iwayemi	Former President, Nigeria Economic Society (NES) and Nigerian Association for Energy Economics (NAEE)	2011
	Name	Organisation	Year of Award
	Prof. Wumi Iledare	2014 IAEE President and Director, Emerald Energy Institute, University of Port Harcourt, Rivers State, Nigeria;	2013
	Name	Organisation	Year of Award
	Prof. Yinka Omorogbe	Nabo Graham Douglas Distinguished Professor of Law, (NIALS); CEO/Founder, Etin Power Limited	2013

## DISTINGUISHED FELLOWSHIP AWARD (FNAEE)

	Name	Organisation	Year of Award
	*Prof. Layi Fagbenle	Professor of Mechanical Engineering, University of Ibadan and Former Energy Adviser to Botswana Government	2013
	*Late		
	Name	Organisation	Year of Award
	*Dr. Emmanuel Egbogah, OON	Chairman, Emerald Resource &, Former Special Adviser to the President on Petroleum Matters	2014
	*Late		
	Name	Organisation	Year of Award
	Dr. Tim Okon	Chief Executive Officer, International Institute of Petroleum, Energy Law & Policy (IPELP), Abuja.	2014
	Name	Organisation	Year of Award
	Prof. Adeola Adenikinju	Director, Centre for Petroleum, Energy Economics and Law, University of Ibadan.	2016
	Name	Organisation	Year of Award
	Dr. Bello Aliyu Gusau	Executive Secretary, Petroleum Technology Development Fund (PTDF)	2018






## DISTINGUISHED FELLOWSHIP AWARD (FNAEE)

	Name	Organisation	Year of Award
	Mr. Osten Olorunsola	Chairman, Energy Institute	2018


  

	Name	Organisation	Year of Award
	Prof. Chidi Ibe	NUC Distinguished Professor in Diaspora, and Professor of Oceanography and Blue Economy	2019

	Name	Organisation	Year of Award
	Prof. Eli Jidere Bala	Fmr. Director General/CEO, Energy Commission of Nigeria	2019

	Name	Organisation	Year of Award
	Chief Michael Olorunfemi	Former Top Management Staff NNPC and OPEC; MD, Mak Mera Limited	2021

## 2023 NAAE/IAEE CONFERENCE: LOCAL ORGANISING COMMITTEE

### General Supervision/Coordination / Sponsorship

Prof. Yinka Omorogbe	-	General Conference Chairman/Coordinator
Prof. Wumi Iledare	-	Plenary Session Chairman/Coordinator
Prof. Adeola Adenikinju	-	Concurrent Session Chairman/Coordinator
Prof. Ben Obi	-	Programme Committee Chairman/Coordinator
Dr Hassan Mahmud	-	Chairman LOC 2023
Mrs Folashade Oje	-	Deputy Chair LOC /Coordinator Protocol & Logistics Sub-Committee
Mrs. Priscillia Ekpe	-	VP Membership & Liaison and Coordinator Dinner & Award Night
Mr. Ere Iyalla	-	Member/Coordinator Secretariat Sub-Committee
Dr. Margaret Hilili	-	Member/Asst.Coordinator Sponsorship Sub-Committee
Mr. Salisu Isihak	-	Member/Coordinator Media & Publicity Sub-Committee
Dr. Gershon Obindah	-	Member/Coordinator Rapporteurs Sub- Committee

### Sponsorship Sub-Committee

Dr. Margaret Hilili	CBN	-	Asst. Coordinator
Mrs Amina Danmadami	NUPRC	-	Member
Mrs Folashade Oje	SGF	-	Member
Prof. Uche Nwogwugwu	Unizik	-	Member
Mr Ere Iyella	PTDF	-	Member
Mr Mudi Abubakar	NNPC	-	Member
Mrs Priscillia Ekpe	NMDPRA	-	Member
Mr Shaibu Faruk	NUPRC	-	Member
Miss Priscilla Okwosha	NAPIMS	-	Member

### Dinner & Award Night / Accommodation Sub-Committee

Mrs Priscillia Ekpe	NMDPRA	-	Coordinator
Ms Oge Modie	Presidency	-	Member
Mrs Margret Kelvin	Woluchem NMDPRA	-	Member
Mrs Amina Danmadami	NUPRC	-	Member
Mr Olaniyan F.	Olatunbosun MPR	-	Member
Dr. Chikwerem Obi	NERC	-	Member
Mrs Esther Oluwagbemi	CPEEL	-	Member
Ms Daniella Aniam	NAEE	-	Member
Mrs. Jennifer Christian	Chinatu PTDF	-	Member

### Secretariat Sub-Committee

Mr Ere Iyalla	PTDF	-	Coordinator
Miss Priscilla Okwosha	NAPIMS	-	Asst Coordinator
Mrs. Folashade Oje	SGF	-	Member
Mrs Esther O.	CPEEL, UI	-	Member
Mr Danjuma Mohammed	NAEE	-	Member
Miss Daniella Aniam	NAEE	-	Member
Mr Azodo Chibuzor	CPEEL	-	Member
Mr Bbosa Robert	CPEEL	-	Member
Mrs. Nwamaraihe Clara	Chiamaka M.A.N.	-	Member



### Media & Publicity/Exhibition Sub Committee

Mr Salisu Isihak NNPC	-	Coordinator
Mr Lanre Oladele PPPRA	-	Member
Mrs Folashade Oje SGF	-	Member
Mrs Magaret Kelvin-Woluchem NMDPRA	-	Member
Mr Victor Ononokpono NMDPRA	-	Member
Mrs Dorcas Igonor AIT	-	Member

### Protocol & Logistics Sub Committee

Mrs Folashade Oje SGF	-	Coordinator
Mr Igbizi Ogah NNPC	-	Member
Mr. Victor Ononokpono NMDPRA	-	Member
Mr Salman Mifta'hu PTFD	-	Member
Dr Margaret Hilili CBN	-	Member
Dr. Joseph Echendu NUPRC	-	Member
Mr. Rufai Abba Dabo PTFD	-	Member

### Rapporteurs Sub- Committee

Dr Obindah Gershon Covenant University	-	Coordinator
Dr. Joseph Echendu NUPRC	-	Ass/ Coordinator
Mr Ali Garba NUPRC	-	Member
Mrs Amina Danmadami NUPRC	-	Member
Mr Babatunde Osho	-	Member
Dr. Chikwerem Obi NERC	-	Member
Dr Tony Akah NERC	-	Member

## ABOUT NIGERIAN ASSOCIATION FOR ENERGY ECONOMICS (NAEE)

### About NAEF

The Nigerian Association for Energy Economics (NAEE) is the Nigerian affiliate of the International Association for Energy Economics (IAEE) with a presence in over 120 Countries all over the World. The NAEF is however the first and currently the only affiliate of the International Association for Energy Economics in Africa.

The NAEF was formally inaugurated in Nigeria in December 2006 at the Nigerian National Petroleum Corporation (NNPC) Towers, Abuja, and one of the fastest growing affiliate in the IAEE.

### Mission Statement

The Association is a nationwide nonprofit organization of business, government, academic and other professionals that advances the understanding and application of economics across all facets of energy development and use, including theory, business, public policy and environmental considerations.

### To this end, the Association:

- \* Provides a forum for the exchange of ideas, advancement and professional experiences in energy economics.
- \* Promotes the development and education of energy professionals
- \* Foster an improved understanding of energy economics and energy related issues by all interested parties.
- \* Provides a forum for contribution to national discourse on energy policy issues in Nigeria.

### Activities of the NAEF

The NAEF seeks to achieve its objectives through the following activities:

- \* Publication of Professional Journal, Books, Newsletters and Press release.
- \* Organizing Seminars, Conferences, Workshops, Public Lectures and other similar fora.
- \* Meetings and such other activities that will promote the objectives of the Association.

### MEMBERSHIP

Membership of NAEF is open to interested persons from the academia, corporate sector, scientific fields and government. According to the IAEE Bylaws, to which NAEF subscribes, any person interested in economics of energy and willing to pursue the objectives and abide by the policies of the Association is eligible for membership.

### The Association has the following categories of Membership:

- Direct Members
- Student Members
- Honourary Members
- Institutional Members

### Membership of NAEF confers one with the following Benefits:

1. Receiving periodic issues of the Energy Journal as well as Economics of Energy & Environmental Policy
2. Participating in Energy Forum
3. Access to Online Worldwide Membership Directory and Online Conference Proceedings
4. IAEE Energy Blog
5. Keeping members informed of conferences and events within the energy industry.
6. Workings Paper Series
7. Placement Service
8. Student Programmes
9. Member Publication Listing
10. IAEE Merchandise
11. IAEE Website
12. IAEE membership
13. NAEF Membership Directory
14. Free downloading of materials in NAEF Website
15. NAEF Membership
16. Receiving Nigerian Energy Newsletter

### HOW TO BECOME A MEMBER

Any person interested in the economics of energy and willing to pursue the objective of the Association is eligible for membership.

