Leadership and Industrialization: The Way Forward for Nigeria

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ABSTRACT

Energy is a key requirement to industrialization which has been vigorously promoted in advanced countries. Leadership in industrial operations is absolutely essential in view of efficiency and risk management. This paper offers a comprehensive submission on leadership as linked to industrialization with strong focus on energy and its security as a driver. Targeting Nigeria as a case of study, different cases have been showcased comparatively, as well as the way forward for effective and efficient leadership in view of industrial operations. Furthermore policy measures and technical concerns in view of energy access and sustainability for industrialization to thrive in the case study country, have been successfully offered. These, in a nutshell, are considered key elements to industrial transformation in Nigeria and beyond.

Keywords: Energy Access; Leadership; Industrialization; Energy Policy; Nigeria

INTRODUCTION

Good governance is a strong requirement for a country to be developed and transformed with ultimately enhanced and sustainable standard and costs of living. This is driven by democracy and leadership with a strong political will. Such a structure is essential to put nations on modern development trajectory of industrialisation. The development is obviously applicable to different sectors viz.: agriculture, manufacturing, mining, transportation, services and so on, which are strongly linked to social, economic, and cultural conditions on profound impact around the globe [1]. On the standard of living, it is important to specify the fact that sophistication of technologies in today's world has resulted in new and efficient products and services which enhance the lives of people [1]. It is important to state further that as a technological input, one of the pathways to triggering industrial transformation is the development of industrial clusters [2]. If linked to effective leadership, it is considered a viable tool to enhanced economic growth and competitiveness in different economies globally.

On the technological input, basing on energy industries, the aspect of adequate, reliable and sustainable energy supply with enhanced level of security of supply, is crucial as a requirement. This ensures following the path of the global energy transition roadmap as reflected in the United Nations Sustainable Development Goals (UN SDGs) and the Net Zero Agenda of the United Nations Framework Convention on Climate Change (UNFCCC) [3]. Nations need to adopt the global energy transition plan but with adjustments to conform to their local situations.

Focussing on the argument to the Nigerian context, transformational leadership is needed to develop Nigeria by following a comprehensive blueprint based on:

1. Implementing the nation's industrialisation policy by setting a vibrant capital goods industry and embracing advanced industrial production techniques.

2. Setting up manufacturing hubs, as part of the industrialisation blueprint, in areas where Nigeria has comparative advantages.

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3. Providing adequate and reliable energy supply with an expanded energy mix to ensure a high level of security of supply.

4. Ensuring that the energy supply is based on the nation's Energy Transition Plan which is based on Nigeria's commitment to the Net-Zero carbon emission pledge by 2060.

Lastly, the paper aimed to provide intellectual contributions towards ensuring industrialization with focus on effective leadership and energy concerns in the Nigerian context. It has been structured in sections viz.: section 1 – introduction, section 2 – leadership and industrialization, section 3 - energy security, section 4 - climate change and energy transition, section 5 - way forward for Nigeria, and section 6 – conclusion.

Leadership and Industrialisation

By definition, a leader is the one who knows the path, shows the path, and walks on the path. It is very true that a person who just guides you and points out the path is not a leader but a boss. But the person, who is ready to step on the risky path with you by holding your hand, is the true leader. A great leader is one who motivates you to achieve success. He is an influencer who is not required to force the people to follow him. But due to his deeds and qualities, people follow him on their own. Hence, in this regard a leader must have a strong personality.

Furthermore, many definitions have been reported for ''Leadership'' in various literature, of which some of the definitions as reported by [1] follow:

*''**Definition 1**: Leadership is an attitude possessed by a leader that is used to influence others in the group to achieve mutually agreed goals. **Definition 2**: leadership is a process where leaders provide influence and examples to each individual they lead with a view to achieving common goals. **Definition 3**: Leadership in organizations is an entity in the direction of the duties or obligations of members in the organization intended to achieve goals''.*

In the control and management of people and resources there are many types of leadership styles, but basically there are two types of leadership in the world today as far as growth and development are concerned. These are: Transactional and Transformational leaders [4]. The Transactional Leadership is viewed as a task oriented leadership based on 2 components i.e. reward and punishment being an extrinsic motivational-based [5]. Hence, in this regard, a transactional leader specifies the task to be performed as well as the expectations and tries to measure performance. Compliance to the expectations tends to be rewarded otherwise a penalty arises for failure. In fact, it is the type of leader, that, in the view of a number of thinkers, agencies most often produce. This is the successful professionals: engineers, doctors, lawyers, accountants, teachers and so on and so forth. They are well educated, do their jobs with diligence, and are often rewarded appropriately. The Transformational Leader is one who also exercises great responsibility in view of creating a vision and inspiring subordinates to struggle and strive beyond the required expectations [6]. Hence, this type of leader is not satisfied with the status quo, with achieving authority and status within established organizations, according to well accepted criteria. It should be noted that the transformational leader has as his or her driving motivation to move their organizations and their co-workers to achieve goals they never thought about, to find inspiration in new ideas. Think of it this way, the transformational leader brings new, larger and richer goals to organizations.

On basing the next argument on industrialization, which is or should be linked to effective leadership for success stories significantly, is viewed in respect of economic and social processes related to the discovery of more efficient ways for the creation of value [7]. Looking at the Nigerian context, it should be noted that the Industrial Policy of the country, which was made public in 1989, aims to make the industrial sector the main source of strength of its economy with the following elements as reported by [8]:

1. Provision of greater employment to Nigerians

2. Increased exports of manufactured goods

3. Promotion of industrial development and national integration through industrial dispersal

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4. Improvement of the nation's technological capacity
5. Increasing local content of industrial outputs to promote enhanced linkages and backward integration
6. Attracting direct foreign investment
7. Increased private-sector participation

In addition to the preceding points, numerous policies and actions have been taken by governments over the years to support industrial development in Nigeria, some of which included: the Nigerian Indigenization Policy (NIP) of 1972-77, Structural Adjustment Program (SAP) of 1986, Trade and Financial Liberalization Policy (TFLP) of 1989, establishment of the Bank of Industry in 2000, National Economic Empowerment and Development Strategy (NEEDS) of 2004, and the Nigerian Industrial Revolution Plan (NIRP) of 2014.

It must be further noted that the economy of Nigeria is described as a middle-income, mixed economy, and emerging market with expanding manufacturing, financial, services, communications, and entertainment sub-sectors. Its GDP as of 2022 was valued at $ 472.62 billion, and with a per capita value of $ 2,163, and hence ranked the 33rd of the major economies in the world [9]. The industries contribute about 30.78% to the Nigeria's GDP compared to 23.69% and 44.04% contributions from agriculture and services respectively [10]. In spite of all its policies and its current position in the world, only three manufacturing sub-sectors: food and beverages; cement; and textiles account for 77% of the manufacturing output in Nigeria. The fact that the manufacturing activities of Nigeria are essentially focused on the production of consumer goods is because there is essentially nothing in terms of new manufacturing techniques as well as no local Capital Goods production.

In providing further details on the capital goods as mentioned earlier, such kinds of goods which should be produced in Nigeria, include:

1. Production technology: Machines like robots, farm equipment or kitchen appliances in a restaurant that are directly used in the production of goods and services.
2. Vehicles owned by a business are capital goods but those owned for personal uses are consumable items.
3. Computing equipment and infrastructure such as networking equipment for use in a firm are capital goods.
4. Electronics such as cameras and videos used by a film crew are capital goods.
5. Power system technologies such as gas turbine plants or solar modules and the balance of system components powering a business are capital goods.
6. Infrastructure like private roads to a factory or business premises are capital goods.
7. Facilities like buildings and data centres used by businesses are capital goods.
8. Furniture, fixtures and office equipment used by businesses are capital goods.
9. Tools such as construction tools or machine tools used by production firms are capital goods.

The top 10 manufacturing nations in the world are also those with the largest Capital Goods sectors with their shares of the global total of 2019 statistics as reported by [11] that follows in table 1:

Table 1: Top 10 Manufacturing Nations on Capital Goods Basis in 2019 [11]

Country	**Share of the World Manufacturing (%)**
China	28.4
United States	16.6

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Japan	7.5
Germany	5.8
India	3.3
South Korea	3.0
Italy	2.3
France	1.9
United Kingdom	1.8
Indonesia	1.4

Energy Security

Energy security being an important aspect in energy operations for a country, region, continent and the globe at large has been defined according to [12] as "*The uninterrupted availability of energy sources at an affordable price*". It is further noted that energy security can be seen from two perspectives, viz.: long term energy security, which deals with timely investment on energy activities for economic development and environmental needs; and short term energy security being the energy system prompt reaction to sudden changes [12]. If electricity supply is from coal and hydro sources is described as having an energy mix of 2, that from coal, gas, solar, hydro and wind will have an energy mix of 5. An energy supply with high energy mix is ascribed with high energy security which manufacturing plants seek to consolidate their productions [13].

From the foregoing, Energy Security is an absolute necessity for economic growth and development of all nations. Reliable energy supplies are needed for supporting industrial productions of all types, powering businesses, powering water supply systems, schools, hospitals etc. Furthermore, energy insecurity, on the other-hand, retards socio-economic growth of nations by leading to higher energy prices generally, higher cost of goods and services as auto-generation of energy has to be recouped, and social instability.

The major factors that affect Energy Security can be identified as:

1. Transformational leadership to ensure that a nation develops and maintains its energy infrastructure
2. Economic growth as it drives energy demand which can lead to energy insecurity if not handled adequately
3. Energy conservation
4. Technological innovations

In addition, to have a brief view of the Nigerian power sector, statistics of 2021 showed a total installed capacity of 11.7GW however, the actual generation capacity leading to 31.5GWh electricity generation was valued at 7500MW [14]. This is extremely inadequate for a population of more than 200 million as an energy security concern. Hence, that ultimately showed the obvious low electrification rate far lower than many countries in Africa. On refinery cases, at the moment, all the 4 federal government owned petroleum refineries with a combined capacity of refining 445,000 bpd are not functional and virtually all the petroleum products requirement of the nation are being imported. This includes transport and industrial fuels. To compound the situation, the imported products are sold to Nigerians at subsidised rates. Reports credited to OPEC indicated that while Nigeria exported $27.73 billion worth of petroleum products in 2020 it imported refined petroleum products worth $71.29 that year showing that $43.56bn was the excess of imports over exports [15]. The Group Managing Director (GMD) of Nigerian National Petroleum Cooperation (NNPC) reported that Nigeria is currently spending more than N400 billion monthly as subsidy on the sale of petroleum products. Other major issues of the Nigerian oil and gas sector that impact the security of petroleum products supply include: oil spills in the Niger Delta, pipeline vandalism, crude oil theft, inadequate pipeline infrastructure, unreliable gas supply, poor gas funding.

The quantified production of crude oil in the case study with the export overview in a trend wise manner have been presented in figure 1:

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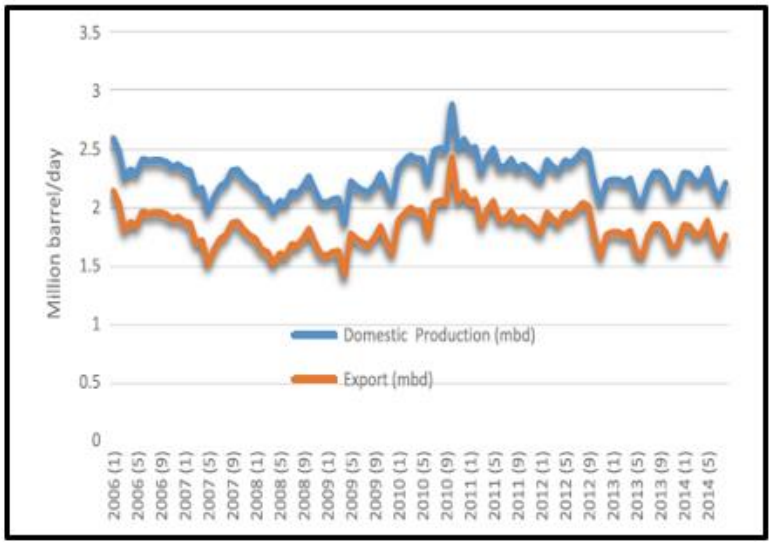

Figure 1: Nigerian Crude Oil Production and Export Trend [16]

Based on the crude oil information presented with the obvious challenges, Dangote Refinery and Petrochemical Complex was commissioned on 22 May 2023. When in full operation it will process about 650,000 bpd of crude oil, making it the largest single-train refinery in the world, of which more than US$ 19 billion was invested in the project [17]. The Complex has the capacity to meet 100% of the Nigerian requirement of all refined products viz.: Premium Motor Spirit (PMS) - 53 million litres per day, Automotive Gas Oil (AGO) - 34 million lires per day, House Hold Kerosine (HHK) - 10 million litres per day, and Aviation Kerosine (AK) - 2 million litres per day. The Complex also has surplus of each of these products for export. This security of petroleum products supply will surely be inadequate when Nigeria's current population of about 220 million people rises to about 400 million in 2050.

Information from the Ministry of Petroleum Resources indicate that more than 30 licences for constructing refineries have been granted but seems only a few are being constructed with their specified capacities as shown in table 2:

Table 2: Constructed Refineries Based-on Licenses with Capacities

Refinery	**Capacity (barrel per day – bpd)**
BUA Refinery in Akwa Ibom with a capacity	200,000
Niger Delta Petroleum Resources (Rivers States)	1,000 (Operational)
Resource Petroleum and Petrochemicals Inc. (Akwa Ibom State)	100,000
Amakpe International Refinery in Akwa Ibom State	12,000
Kainji Resources Limited (Imo State)	24,000
Omega Butler Refinery in Rivers State	20,000

Climate Change and Energy Transition

Global temperature rise arising largely from combustion of fossil fuels is the principal cause of global warming which if not curtailed will lead to climate change in general with impacts or outcomes viz.: melting of the glaciers, massive global floods, droughts, increased fire threats, weed and pest invasions, amongst others. Although Nigeria and the developing nations were not the contributors of the emissions that have brought climate change to the world but because the environment has no borders we are, in Nigeria, already suffering from climate change impact. The impact is clearly evidenced by: temperature rise, rainfall variability, increased desertification, rising sea levels, erosion and floods, bush fires, and loss of biodiversity [18].

It has since been confirmed by the IPCC that about 87% of CO2 emissions from human sources arise from the combustion of fossil fuels and has 4 major components: electricity generation - 41%, transportation - 23%,

industry - 20%, and Others - 16% [3]. There is the urgent need to significantly minimize CO2 emissions in the power and transport sectors. Sustainable pathways should be adopted for stability of the environment. It should be noted that in 2015 the United Nations adopted the 17 Sustainable Development Goals (SDGs), amongst others, by 2030 curtail the catastrophe that will befall the world from the increasing menace of global warming and Climate Change [3]. SDG7 in particular is for all nations to provide universal access to modern energy services to its citizens by 2030 as well as to significantly increase the uptake of renewable energy and doubling of energy efficiency. After monitoring the implementation of the SDGs, it was concluded that the world will not limit temperature rise at 1.5 °C and thereafter, the 2050 Net Zero Agenda was brought forth [3]. The Agenda:

1. Aims at a situation of zero carbon dioxide emissions globally
2. To be attained by use of renewable energy and electric vehicles
3. And also by carbon capture techniques in addition to developing forestry plantations to serve as carbon sinks.

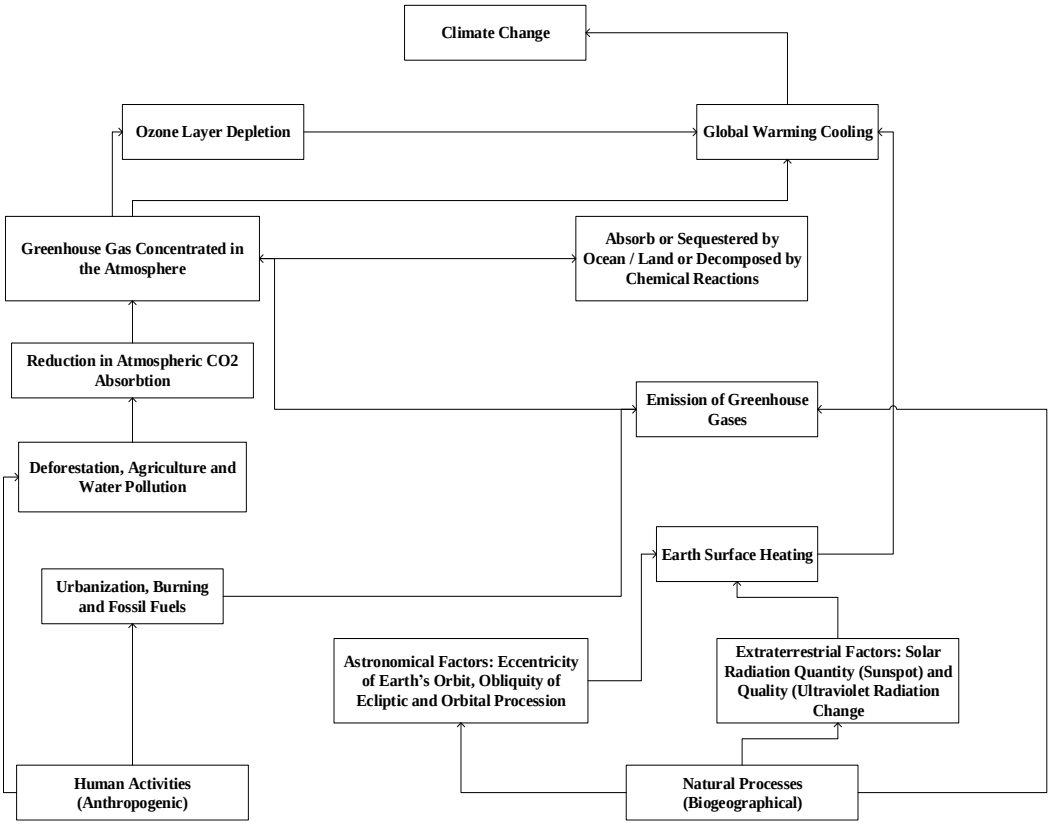

Figure 2: Causal Factors of Climate Change [18]

Nigeria pledged to attain Net Zero emissions by 2060 through its Energy Transition Plan that was presented to the Climate Change Conference in 2021 and reconfirmed at the edition of 2022 at Egypt. This was following all commitments from the 2013 where the African Union (AU) adopted Agenda 2063 after recognizing Climate Change as a key challenge to the continent's development and agreed that member states should produce their Nationally Determined Contributions (NDCs) for abating Climate Change complications.

The Way Forward for Nigeria

On Leadership, even though the preferred option is to have a Transformational Leadership over Transactional one, in the political terrain of Nigeria today it will be very difficult to get any of the two leaderships. A move towards getting Nigerians to be more interested in getting good leaders will need the following steps:

1. A massive nationwide campaign to enlighten political groups and indeed Nigerians as a whole on the virtues of deepening democracy. The campaign should also highlight the need for enhanced inclusivity in political programmes leading to the election of candidates for political offices.

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2. Political groups should be made to understand the paths for the sustainable development of nations and to adopt pragmatic blueprints in their manifestos.

3. The nation's political groups should be made to understand the need for them to nominate, for elections, only members adjudged to possess strong political will for national development.

4. Industrialisation, as earlier explained, will require the adoption of advanced manufacturing techniques as well as the production of Capital Goods in Nigeria.

5. Advanced manufacturing techniques, as currently being promoted by NASENI which include virtual manufacturing, pre-fabrication, and additive manufacturing technologies should be promoted. Capital Goods, are the assets used by manufacturing industries and businesses to, in turn, produce items of goods and services.

6. As earlier indicated for Nigeria to be industrialised it must produce capital goods in-country and this requires: A robust National Policy on Capital Goods which should include partnerships with two or three advanced nations to set up capital goods production factories in Nigeria. The factories will start as assembly plants with increasing local contents in the years ahead.

7. Apart from legal and regulatory frameworks, the Policy should also include investment schemes and sound capacity-building training of Nigerians on all aspects of the Capital Goods Industry.

8. A critical step for Nigeria to become an industrial nation is that it must review its current industrial policy to be more focused on: increased local content of its industrial outputs, enhanced linkages and backward integration, enhanced foreign direct investment, and facilitation of the private sector to lead in manufacturing

A solid manufacturing sector in Nigeria will necessarily need:

1. Local production of major capital goods that will be needed by several manufacturing sub-sectors

2. Entrenchment of advanced manufacturing technologies of virtual manufacturing, pre-fabrication, and additive manufacturing.

3. Ready availability of iron and steel which the completion of Ajaokuta Steel Complex will enable

4. Significant strengthening of the production of agricultural outputs for setting up numerous agro-allied industries

5. Encouraging the establishment of mines and mineral processing plants for adding values to the mined ores.

6. Regular and reliable energy supply.

7. Significant improvement of the security situation throughout the nation.

Capital Goods are physical assets that are used by companies to manufacture products and services needed by consumers. Examples of Capital Goods include buildings, machinery, equipment, vehicles and tools. Capital Goods are not finished products which means they are the man-made materials or systems that are needed to produce goods and services. The more a country invests in its capital goods the stronger its economy and GDP. The following pathway is recommended for Nigeria to industrialized:

1. For electricity supply, enhanced Energy Security should not only include gas and renewable energy sources (solar, wind, biomass/biofuels and hydro) but it should also include nuclear power in the Electricity Generation Expansion Plan (EGEP) since nuclear plants do not produce carbon emissions. The EGEP should be designed from now to 2060. Gas, which currently constitutes about 80% of the

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source for power, should be progressively reduced in percentage to be increasingly replaced by the renewables. The EGEP should cover generation, transmission and distribution along the line of the demand and supply projections as being carried out by the Energy Commission of Nigeria (ECN) and should have an expanded energy mix for enhanced security of supply.

2. A special purpose vehicle similar to the NIPP/NDPHC should be created to expand generation and associated transmission/distribution infrastructure which should be transparently privatised after commissioning.

3. In line with global trends, off-grid and mini-grid supplies should be adopted to obviate delays often created by waiting for grid extensions.

4. Embedded plants should be adopted for bridging the demand - supply gap for municipalities that are heavy load centres.

5. The Nigerian Electricity Regulatory Commission (NERC) should closely monitor all players of Nigerian Electricity Supply Industry (NESI) such that those clearly underperforming should be sanctioned in line with the statutes.

6. The very recent amendment of the Nigerian Constitution allowing States to generate, transmit and distribute electricity even in areas covered by the National Grid is a welcome development as it will enhance the security of electricity supply in the nation.

7. A national power summit is urgently needed to adopt uniform guidelines for State Governments to be involved in power supply.

8. From now to the Nigeria's Net Zero Emissions pledge year of 2060, Dangote Refinery's expected output along with the 6 private refineries being developed will be expected to satisfactorily meet transport fuels needs of Nigeria.

9. Attention should be focused on encouraging Nigerians to go for the development of numerous gas fields that have been confirmed in different parts of the country.

10. The gas is very much needed for gas power stations as well as for the provision of Autogas and Compressed Natural Gas (CNG) for the transport sector.

11. Gas, is also needed not only for the Ajaokuta – Kaduna – Kano (AKK) Gas Pipeline project to transport gas from the Niger Delta to Ajaokuta, Kaduna and Kano but also to be taken through the Trans-Saharan Pipeline to Algeria and to Europe.

On Climate Change and Energy Transition, it should be noted that while the global Energy Transition Plan (ETP) prepared by the International Energy Agency has no provisions for new fossil fuel plants from now to 2050, the Nigerian version, in line with its "Just Energy Transition Policy", provides for the significant use of gas, being the cleanest of the fossil fuels, and renewable energy. The Nigerian Energy Transition Plan (ETP) can be described as one that has included a timeline and framework for achieving reduced emissions from utilisation of the oil products of petrol, diesel and kerosine products in cooking, in transport, in industries and in power generation mainly by refocusing to use the huge gas resources of the nation. The Nigerian ETP, and indeed the global ETP, do not highlight the fact that the pledge of nations is for net zero emissions by the pledge dates and not absolute zero emissions. A country like Nigeria that is discovering newer gas fields ought to have a long-term energy plan and to come up with:

1. Circular carbon economy system to mop up the emissions from the gas utilisation activities like Saudi Arabia is spearheading the world.

2. The development of forestry plantations, which serve as excellent carbon dioxide sinks, is a practical way to handle emissions even beyond our pledge year of 2060. Electric vehicles, which are the most

effective way of significant reduction of emissions from the transport sector, are only mentioned in passing in the plan.

3. The nation's Electric Vehicles Policy ought to have been approved and passed into law by now. Another gap is the lack of provision to incentivise the private sector to key into the entire ETP.

Based on the different findings presented as way forward for Nigeria, it is important to offer some clear theoretical justifications as follows:

1. On a general note, the recommendations provided are strongly for strengthening the economic growth, economic development and economic transformation of Nigeria.

2. On the point of power sector diversifications by incorporating clean and sustainable energy sources, coupled with the gas power plant option being less in impact than other fossil fuels, it is an ultimate contribution to the entire climate change mitigation campaign and struggles. This is in response to the Conference of the Parties (CoP) set objectives.

3. To reflect on the leadership aspect, the contributions provided as political measures shall call for a transformative leadership and a better environment that shuts doors for corrupt practices.

FUTURE RESEARCH WORK

In line with the contributions presented in this paper for the case of Nigeria, some recommendations for future work in line of the research have been presented below:

1. Potentials exist for research on several options of industrial operations in the country especially with reference to environmental and economic life cycle assessment based on a number of impact categories coupled with detailed policy evaluations.

2. Research regarding in-depth analysis of industrialization with respect to power supply distinctions could be necessary in obtaining technical and policy models and results of relevance to decision makers in the energy transition.

3. Lastly, it shall be of interest to develop various scenarios of energy demand and supply for industrial clusters in Nigeria.

CONCLUSION

This paper touched on several aspects linked to effective leadership for supporting development in general and industrialization in particular, in Nigeria. Several pathways were provided for the country while also making strong recommendations on energy supply considerations. Emphasis was made on the fact that transformational leadership is needed to develop Nigeria by producing and implementing a comprehensive development blueprint based on:

1. Implementing the nation's revised industrialisation blueprint by first and foremost setting up a vibrant capital goods industry by partnering with some of the countries that are advanced in capital goods production. The blueprint will also require setting up manufacturing hubs based on the nation's comparative advantages in:

2. Agriculture and agro-allied enterprises

3. Mining and mineral processing and

4. Petrochemicals

5. The rapid industrialisation of Nigeria will be advantageous to the nation in the African Continental Free

Trade Area (AfCFTA).

6. Providing adequate and reliable energy supply with expanded energy mix to ensure high level of security of supply and in line with the nation's energy demand and supply projections.

7. There is need to assess the impact of both the Petroleum Industry Act of 2021and the Electricity Act 2023 to address complaints and observed lapses.

8. The local production of power plant components like transformers, solar panels and their balance of systems components of inverters, deep cycle rechargeable batteries and charge controllers, along the lines of what NASENI and a few others have started, should be supported and expanded to cater for the nation's needs and to key into the AfCFTA initiative in the long term.

9. The nation's Electric Vehicles policy should be approved and implemented to ensure the adoption and local production of electric vehicles in the country.

10. The development of adequate manpower in line with the nation's National Energy Manpower Development Plan, to ensure adequate manpower to design, construct, operate and maintain the nation's energy systems as well as to plan and source funds for their constructions.

11. The entrenchment of energy efficiency and conservation techniques is necessary for minimising wastages and optimising the use of scarce energy systems development funds.

12. There is need to ensure that the energy supply is based on the nation's Energy Transition Plan which is based on Nigeria's commitment to the Net-Zero carbon emission pledge by 2060 and reflecting the nation's Nationally Determined Contributions for abating climate change but in line with its "Just Energy Transition Policy".

AUTHORS CONTRIBUTION

1. Conceptualization and Analyses – ASS

2. Original Draft Preparations – IAJ and ASS

3. Extra Inputs – IAJ and MM

4. Review, Corrections and Overall Supervision – ASS and MM

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