Enlight Series

Nextier | The Enlight publication is a series of weekly articles on the Nigeria Electricity Supply Industry (NESI) that focuses on capacity building and increased access to sector information | Volume 3, Issue 51 | August 2023

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The Energy Transition Plan and Nigeria's Industrial Sector

Introduction

In August 2022, Nigeria developed its Energy Transition Plan (ETP) in line with its commitment to limit global warming to 1.5^{0}C under the 2015 Paris Agreement. The ETP developed an implementing framework for transitioning to renewable energy for five sectors: industry, cooking, transport, oil and gas, and power. With respect to the industrial sector, the plan's near-zero carbon emission strategies will have significant compliance implications for industry players. Thus, establishing a predictable and sound policy is critical for industry planning and decision-making. First, consideration should be given to the transition plan's industrial decarbonization strategies.

Background

Nigeria's ETP Industrial Decarbonization Strategies include a. Clinker substitution: substituting calcined clay with clinker; b. Application of Bioenergy with Carbon Capture and Storage (BECCS) in cement production; c. Replacement of grey hydrogen (Hydrogen produced from fossil fuels) with green and blue hydrogen in ammonia production; and d. The adoption of zero-emissions fuels such as clean electricity and hydrogen for heating instead of natural gas and biomass. Per the identified strategies, the industrial sector will have to modify existing industrial processes to comply with the decarbonization strategies. According to McKinsey's article on the implication of the energy transition for the machinery industry, these adjustments will pose substantial cost, technology, and regulatory challenges for the industrial sector as existing machinery relies on mechanical systems powered by carbon-emitting diesel or gasoline. As a result, the industrial sector would be left with two basic options, either continue with mechanical equipment but with lower-carbon, such as green and blue hydrogen in ammonia production, or switch to clean electricity. The implications of either choice are substantial.

Implications

1. Increased operational and capital expenditure uncertainty

The shift to electric systems and low-carbon technologies would typically be disruptive because of the operational expenditure and capital changes across the manufacturing value chain. The small components, such as pumps and valves, to the large complex machinery, including trucks, aero-plane excavators, and hauling trucks of original equipment manufacturers, will be affected. Also, the ease of the transition is uncertain because reports suggest it will take about ten years before clean technologies are ready for market deployment.

2. Reduced global competitiveness

Conglomerate industry players may have trouble remaining competitive. For example, Dangote Industries Limited is the leading producer and exporter of cement in Africa, with operations in 10 African countries with a record of $3.5 billion in revenues. As the ETP requires cement producers to adopt high-cost technologies like BECCS, regions with weaker regulations may be able to leverage this and gain market share, limiting the inflows of foreign exchange. This will lead to thin profit margins that may further constrain the private equity needed to switch to cleaner technologies.

3. Displaced workforce

As clean technologies replace industrial processes, fossil fuel-dependent industries' workforce skills would be unusable. Therefore, the industry will experience a decline in employment opportunities as the transition takes effect. Sector stakeholders should incorporate strategies for supporting redundant workers through reskilling or retraining.

4. New regulatory compliance schemes

The industrial sector will need to comply with regulations to transition to clean energy. This compliance will entail adjustments in manufacturing processes, stricter emission standards, and energy-efficient measures. Alongside statutory requirements, private investors are also favouring investments in cleaner technologies. However, the challenge is the novelty of this transition; it's simply unprecedented. EY Global suggests ways in which national regulators can support the energy transition; this includes defining the current and evolving roles of critical players in the electricity value chain. Therefore, a flexible framework should be designed to manage the energy transition and attract private capital efficiently to maintain the proper financial position of industry stakeholders and ensure a just transition.

Analysis

The ETP estimates $1.9 Trillion is required to transition to net zero by 2060. Private sector investments are the most viable option to raise the estimated capital as the federal government is cash-crunched; hence, a robust framework is needed to establish comprehensive strategies for reducing CO2 emissions in the industrial sector and gain investor confidence. For example, one of the decarbonization strategies is the replacement of grey hydrogen - hydrogen from fossil fuels – with green and blue hydrogen. However, the technologies required to commercialize green and blue hydrogen, i.e. capturing and storing the carbon dioxide released, have not made significant progress in the past decades. Blue and green hydrogen technologies are still high-cost. According to the Institute for Energy Economics and Financial Analysis, blue hydrogen costs the UK 36% more than its 2021 estimate. In addition, the industrial strategy for replacing hydrogen in ammonia production does not provide timelines for when the industrial sector must retrofit high-emitting plants. The federal government can implement sunset clauses to specify dates for high-emitting plant retrofits. Furthermore, industry stakeholders should consider the CO2 reduction required over the upcoming years to reduce losses incurred from the early retirement of high-emitting plants. Thus, a rigorous roadmap is essential to set the direction and pace of the transition. A rigorous framework will require a multi-faceted policy response. Mandatory CO2 reduction policies that progressively increase in stringencies, such as emissions trading schemes and carbon taxes, should be the overarching theme of an energy transition framework. The International Energy Agency (IEA) on accelerating sustainable energy transitions in heavy industry, proposes that a sound policy framework should support specific technology areas and strategies. It should also ensure that necessary enabling conditions are established with respect to international cooperation, monitoring and evaluation, and infrastructure development. For targeted specific technologies like blue and green hydrogen, the Energy Transition Office can, amongst others:

1. Manage existing high-emitting plants and near-term investments;
2. Create a market for low-carbon emission materials;
3. Develop measures that address complex technical elements;
4. Design a level-playing field for producers shifting to clean technologies to maintain global competitiveness; and
5. Support and develop earlier-stage technologies.

Additionally, stakeholder collaboration between governments, material producers, and other critical actors should be the driving force to facilitate the transition.

Conclusion

The ETP reshapes the country's industrial sector, requiring adaptation to new regulations, workforce transitions, and technological innovation. Successfully managing these implications is critical for a more sustainable and resilient industrial sector. A risk-responsive framework is required to prevent significantly destabilizing the industry and carrying faults whilst supporting infrastructure to accelerate deployment once clean energy technologies become available. The IEA also emphasizes that industry players must strike a balance between investing in near-term high-emitting plants and low-carbon emission technologies in the medium term to progress market readiness for the energy transition.

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