

12 May 2025

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## TEMPLARS ThoughtLab

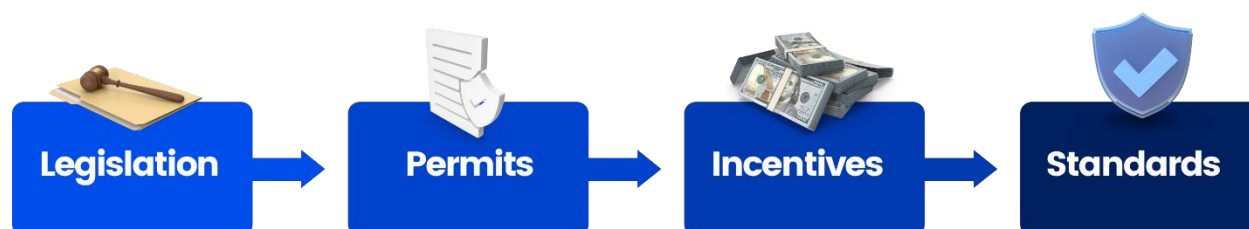
# International Finance Corporation Publishes Landmark Nigerian CO2 Storage Atlas: *What's Next?*

March 2025, saw the publication of the Nigerian CO2 Storage Atlas (the “**Atlas**”). The report, spearheaded by the International Finance Corporation (“**IFC**”) with support from the World Bank Carbon Capture and Storage Trust Fund (“**CCS TF**”), technical expertise from Halliburton, and the active collaboration of the Federal Government of Nigeria and key regulatory bodies including the Nigerian Upstream Petroleum Regulatory Commission (“**NUPRC**”), Nigerian Midstream and Downstream Petroleum Regulatory Authority (“**NMDPRA**”), National Oil Spill Detection and Response Agency (“**NOSDRA**”) and Nigerian Geological Survey Agency (“**NGSA**”) signifies a major step for Nigeria’s exploration and potential deployment of Carbon Capture, and Storage (“**CCS**”) technologies and lays a crucial foundation for the broader Carbon Capture, Utilization, and Storage (“**CCUS**”) technologies. However, while the Atlas lays a foundation for CCUS, its scope does not consider the utilization of CO2, such as enhanced oil recovery. Consequently, all details of the carbon capture, transport, and storage lifecycle within this Atlas refer to potential CCS projects only and not to CCUS.

Generally speaking, Carbon Capture offers a pathway to continued industrial development while significantly reducing emissions compared to historical trajectories. In particular, Nigeria, with its rapidly expanding population projected to become the 3rd most populous country by 2050, faces the dual challenge of fostering economic growth and meeting its stated commitment to reduce greenhouse gas (“**GHG**”) emissions by at least 20% below business-as-usual levels by 2030.

The Atlas lays essential groundwork for the development of first-mover CCS projects and the eventual establishment of CCS hubs and clusters that can achieve economies of scale through shared transportation and storage infrastructure.

## Nigeria's CCS Readiness Roadmap



### Key Findings of the Nigerian CO<sub>2</sub> Storage Atlas: Unveiling Nigeria's CCS Potential

- Significant Prospective Storage Resources: The Atlas estimates that **Nigeria possesses a substantial 10,700 gigatonnes (Gt) of prospective CO<sub>2</sub> storage resources**. To put this in perspective, global climate ambitions necessitate the storage of approximately 10 Gt of CO<sub>2</sub> annually worldwide by 2050. This finding suggests that Nigeria possesses a theoretical CO<sub>2</sub> storage capacity of a scale that could significantly support the decarbonization of its domestic industrial sectors through CCS.
- Concentration of Emissions and Infrastructure in the Niger Delta: The analysis reveals a high concentration of industrial CO<sub>2</sub> emitters in the Niger Delta region, particularly around Lagos, Port Harcourt, and Warri/Sapele. Importantly, this region also benefits from existing oil and gas pipeline infrastructure that could potentially be repurposed for CO<sub>2</sub> transport, alongside existing ports and railways offering alternative transport solutions.

Optimal Storage Locations in the Niger Delta: The Atlas identifies the Niger Delta, specifically saline aquifers and depleted oil and gas fields within the Miocene-age formations, as the most promising locations for CO<sub>2</sub> storage due to their geological characteristics.
- Potential for CCS Hubs: The favorable co-location of emissions sources, transport infrastructure, and storage potential around industrial hubs like Port Harcourt, Lagos, and Warri presents significant opportunities for the development of integrated CCS value chains and the establishment of CCS hubs
- Addressing Transportation Challenges for Inland Emitters: The Atlas acknowledges the challenges of transporting CO<sub>2</sub> from inland emission sources, such as cement manufacturing plants, which are geographically distant from existing pipeline infrastructure. However, it also explores the potential for alternative transport methods like rail and ship for smaller volumes and longer distances, referencing successful international case studies like the Northern Lights project in Europe.
- Leveraging Depleted Hydrocarbon Fields: The Atlas highlights the significant potential of utilizing depleted oil and gas fields in the Niger Delta for CO<sub>2</sub> storage. These fields benefit from extensive historical data from hydrocarbon exploration activities, providing a higher level of technical readiness and geological understanding compared to less explored areas.

- Call for Further Assessment: While the Atlas provides a crucial initial assessment, it emphasizes that significant further work, including well exploration and analysis, increased data gathering, geological modeling, and detailed risk analysis, will be necessary to mature these prospective storage resources into confirmed and usable storage capacity.

## Regulatory Environment for CCS in Nigeria: Current Status and Future Pathways

The establishment of a clear, comprehensive, and enabling regulatory environment is paramount for the successful development and deployment of CCS technologies in Nigeria. The Nigerian CO<sub>2</sub> Storage Atlas provides a valuable overview of the current regulatory landscape and identifies key areas for future attention.

### Current Supportive Policies and Regulations:

Beyond the specific regulatory instruments highlighted in the Atlas, Nigeria's broader legal and policy landscape contains elements that can support the initial stages of Carbon Capture and Storage (CCS) development. These include:

- Petroleum Industry Act 2021 (PIA): The PIA mandates environmental management plans for petroleum license holders<sup>1</sup>, which could potentially incorporate CCS as a mitigation strategy.
- NMDPRA Midstream and Downstream Petroleum Environmental Regulations 2023: These regulations include a dedicated section on climate change and GHG management, requiring licensees to monitor, estimate, and report GHG emissions and to develop strategies for carbon capture, decarbonization, and achieving net-zero targets<sup>2</sup>.
- National Environmental Standards and Regulations Enforcement Agency ("NESREA") Regulations: While not specific to CCS, NESREA's existing regulations outline best practices for emissions control in the energy sector and include GHGs within their scope<sup>3</sup>.
- The Climate Change Act 2021 (the "CC Act")<sup>4</sup>: This establishes the legal framework for achieving low greenhouse gas (GHG) emissions and promoting sustainable economic growth in Nigeria, with a target of net-zero GHG emissions between 2050 and 2070. While the CC Act does not explicitly mention specific technologies like CCS, it provides the overarching framework for coordinating climate change action to meet Nigeria's long-term climate objectives, within which CCS naturally fits as a key technological solution<sup>5</sup>.
- NUPRC Policy on Decarbonisation and Energy Sustainability in Nigerian Upstream Oil and Gas Operations (Upstream Petroleum Decarbonisation Template): The policy stipulates the development of carbon management and monetisation initiatives, including CCS as a mandatory component of applications for licences, permits, and approvals across upstream activities, commencing in January 2025<sup>6</sup>.

<sup>1</sup> Section 79(2)(h) PIA

<sup>2</sup> Section 20 Midstream and Downstream Petroleum Environmental Regulations 2023.

<sup>3</sup> Section 2 NESREA National Environmental (Energy Sector) Regulations, 2014.

<sup>4</sup> For more detailed information on the CC Act, see our previous article on the subject here: [Climate-change-and-energy-transition-is-Nigeria-on-course-with-its-new-Climate-Change-Act-2021.pdf](#)

<sup>5</sup> Section 1 CC Act

<sup>6</sup> Access at: [POLICY-RELEASE-Introduction-of-Regulatory-Decarbonisation-Template-for-Upstream-Oil-Gas-Operations-in-Nigeria-1.pdf](#)

- Notably, the NUPRC's Acreage Management Regulations, currently in draft form, explicitly include provisions for carbon capture and storage services within existing lease areas. This early inclusion, even in a draft stage, provides insight to the regulator's thinking towards integrating CCS into the upstream sector<sup>7</sup>.

### Current Regulatory Gaps and Future Opportunities:

Although these existing regulations offer a starting point, there are significant gaps that need to be addressed to facilitate the full-scale deployment of CCS in Nigeria:

- Lack of Specific CCS Legislation: Nigeria currently lacks dedicated legislation that comprehensively addresses all aspects of the CCS value chain, including permitting, long-term liability, and monitoring of storage sites.
- Fragmented Regulatory Oversight: The regulatory landscape involves multiple agencies with overlapping or unclear jurisdictions regarding CCS activities.
- Absence of Clear Permitting Processes: Streamlined and transparent permitting processes specifically for CCS projects are currently lacking.
- Limited Financial Incentives: Nigeria currently lacks specific and dedicated financial incentives explicitly designed for CCS projects. Although broader fiscal mechanisms such as tax holidays<sup>8</sup> and potential eligibility for gas utilization investment allowance<sup>9</sup> (if CCS is integrated with gas projects) might offer some indirect benefits; and the operationalization of the Emissions Trading System (ETS) holds promise for generating revenue through carbon credit trading, targeted financial support remains a limited aspect of the current regulatory landscape for CCS. Lack of Specific CO<sub>2</sub> Storage Standards: Nigeria does not yet have its own national standards for CO<sub>2</sub> storage, which is crucial for ensuring safe and effective long-term sequestration.

### Conclusion:

The Nigerian CO<sub>2</sub> Storage Atlas represents a significant milestone in Nigeria's commitment to a low-carbon future. The substantial storage potential identified, coupled with the existing industrial infrastructure, presents a compelling case for investing in Carbon Capture and Storage technologies in Nigeria.

However, harnessing this potential will require a concerted effort to develop a comprehensive and enabling regulatory framework that provides clarity, certainty, and incentives for CCS project development. This includes enacting dedicated CCS legislation, establishing a centralized regulatory authority or clear inter-agency coordination, developing transparent and efficient permitting processes, implementing financial incentives, and adopting national CO<sub>2</sub> storage standards based on best practices.

<sup>7</sup> Section 36(3) Draft Acreage Management, Drilling and Production Regulations

<sup>8</sup> The Industrial Development (Income Tax Relief) Act provides tax holidays through the Pioneer Status Incentive for qualifying new industries. While CCS is not currently explicitly listed, it represents a broader fiscal mechanism that CCS projects might potentially leverage if deemed a pioneer industry in the future.

<sup>9</sup> For more detailed information on Gas Utilization investment allowance, see our previous Client Alert on the subject here: [CLIENT-ALERT-Do-we-Finally-have-Lift-off.pdf](#)