



METHANE MITIGATION AND REDUCTION MAPPING REPORT IN NIGERIA'S OIL AND GAS SECTOR



DEPARTMENT OF CLIMATE CHANGE
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Acknowledgments and citation

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Acronyms

AFOLU	Agriculture, Forestry and Other Land Uses
AGO	Automatic Gas Oil
AGRA	Associated Gas Re-injection Act
APRI	Africa Policy Research Institute
BPD	Barrels per day
BTEX	Benzene, toluene, ethylbenzene and xylene
CAPPA	Corporate Accountability and Public Participation Africa
CATF	Clean Air Task Force
CCAC	Climate and Clean Air Coalition
CEHRD	Centre for Environment, Human Rights and Development
CISLAC	Civil Society Legislative Advocacy Centre
CO₂	Carbon dioxide
CPI	Climate Policy Initiative
DCC	Department of Climate Change
DFI	Development Financial Institution
DPK	Dual Purpose Kerosene
EGASPIN	Environmental Guidelines and Standards for the Petroleum Industry in Nigeria
EIA	Environmental Impact Assessments
ERA	Environmental Rights Action
ETP	Energy Transition Plan
EU	European Union
FCDO	Foreign, Commonwealth and Development Office
FI	Financial Institution
FMFBNP	Federal Ministry of Finance Budget and National Planning
FoEI	Friends of the Earth International
GDP	Gross Domestic Product
GFMR	Global Flaring and Methane Reduction Partnership
GGFR	Global Gas Flaring Reduction Partnership
GHG	Greenhouse Gas
GMA	Global Methane Alliance

GMI	Global Methane Initiative
GMP	Global Methane Pledge
HCT	Host Community Development Trusts
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change
LDAR	Leak Detection and Repair
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
LTV	Long-Term Vision
MBPD	Million barrels per day
MDA	Ministries, Departments and Agencies
MMRP	Methane Mitigation and Reduction Project
MoFI	Ministry of Finance Incorporated
MOSR	Mineral Oils (Safety) Regulations
MRV	Monitoring, Reporting and Verification
NAMA	Nationally Appropriate Mitigation Actions
NCA	Nigerian Content Act
NCCC	National Council on Climate Change
NCCP	Nigeria Climate Change Policy
NCDMB	Nigerian Content Development Monitoring Board
NDC	Nationally Determined Contribution
NDPEHRD	Niger Delta Project for Environment, Human Rights and Development
NGA	Nigeria Gas Association
NGFCP	Nigeria Gas Flare Commercialization Programme
NGLs	Natural Gas Liquids
NGO	Non-governmental Organization
NipeX	Nigerian Petroleum Exchange
NLNG	Nigerian Liquefied Natural Gas
NMDPRA	Nigerian Midstream and Downstream Petroleum Regulatory Authority
NNPC	Nigerian National Petroleum Company
NOSCP	National Oil Spill Contingency Plan
NOSCS	National Oil Spill Contingency System
NOSDRA	National Oil Spill Detection and Response Agency
NUPRC	Nigeria Upstream Regulatory Petroleum Commission
OGCI	Oil and gas Climate Initiative
OGMP	Oil and Gas Methane Partnership
OPEC	Organization of the Petroleum Exporting Countries
OPM	Oxford Policy Management

OPRC	Oil Pollution Preparedness, Response and Cooperation
PIA	Petroleum Industry Act
PIER	Petroleum Industry Environmental Regulation
PIK	Potsdam Institute for Climate Impact Research
PMS	Premium Motor Spirit
PPTA	Petroleum Profit tax Act
PSA	Production Sharing Agreement
R&D	Research and Development
SDG	Sustainable Development Goal
SLCPs	Short-Lived Climate Pollutants
SMET	Satellite-based Methane Emission Tracker
SPDC	Shell Petroleum Development Company
TNP	Trans-Niger Oil Pipeline
UK	United Kingdom
UN	United Nations
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
US	United States
VOCs	Volatile Organic Compounds

Executive summary

This report provides a multi-dimensional analysis of methane mitigation in Nigeria's oil and gas sector. It examines national priorities, existing policies, stakeholder roles and financing landscapes to identify opportunities for progress and alignment with national and global climate goals.

Methane, a potent greenhouse gas with significant warming potential compared to carbon dioxide, poses a major threat to global climate goals. According to the Short-Lived Climate Pollutants (SLCPs) National Action Plan, Nigeria recorded an estimated 439.8 kilotons of methane emissions within the oil and gas sector.¹ Notably, 27% of these emissions were associated with oil production, while a significant majority, 73%, emanated from gas production, processing and distribution. Reducing methane emissions, particularly from this sector, offers a strategic opportunity.² By acting, Nigeria can strengthen climate action and unlock co-benefits for public health, food security and economic development, aligning with national and multiple sustainable development goals (SDGs).

Methodology and approach

This report uses a mixed-method research approach in combination with several tools. It is built on early-stage engagement, desk-based study, and a national stakeholder validation workshop to provide a holistic understanding of the current state, challenges, opportunities and potential pathways for enhancing methane mitigation strategies in alignment with national priorities and global climate action imperatives.

The approach and methodology adopted for this task have been designed to make the procedure compatible with Nigeria's socio-economic context and realities. The methodology conceptualized ensures that the approach is representative and captures the entire landscape (policies, regulatory frameworks, strategies, finance and stakeholder layout) of Nigeria's oil and gas sector.

Key findings

Assessing local policy alignment with national needs

On paper, Nigeria's existing policies are fairly coherent with the country's international commitments and national objectives for methane mitigation and reduction. The Nigerian Upstream Petroleum Regulatory Commission (NUPRC) Guidelines for Management of Fugitive Methane and Greenhouse Gases Emissions in the Upstream Oil and Gas Operations in Nigeria (NUPRC Guide 0024 - 2022) are aligned with the Global Methane Pledge's target of a 30% reduction by 2030 and are consistent with the Intergovernmental Panel on Climate Change's (IPCC) requirement for a 20% to 60% reduction by 2030. Similarly, based on national needs, at the 2022 maiden national stakeholders' summit on the use of satellite for tracking gas flare and emissions monitoring in the oil and gas sector in Nigeria,

the National Oil Spill Detection and Response Agency (NOSDRA) announced a policy decision to develop a Satellite-based Methane Emission Tracking (SMET) platform to promote the use satellite remote sensing technologies for detecting, measuring and quantifying methane emissions in Nigeria's oil and gas industry.

The preliminary findings reveal that there is a need for coherent and ambitious methane action plans that align with Nigeria's national development priorities. Strategically implementing policies and regulations that incentivize low-carbon investments, promote sustainable land use practices, and foster innovation in clean technologies can accelerate progress towards climate mitigation goals.

Stakeholder mapping and analysis

In mind of the climate and broader societal transformation, understanding the stakeholder landscape is vital for effective and sustainable actions around methane mitigation and reduction. The preliminary stakeholder mapping process was therefore developed using a blend of Mendelow's Matrix and the Salience Model.

Mendelow's Matrix categorizes stakeholders based on their power (influence) and interest (stake) related to the project. The Salience Model analyzes stakeholders based on their power, legitimacy and urgency regarding the project. Table A sets out the power, interest and influence of the stakeholders on the project, using the Mendelow and Salience mapping model.

Table A: Preliminary analysis of the multi-stakeholders using the Mendelow and Salience mapping model

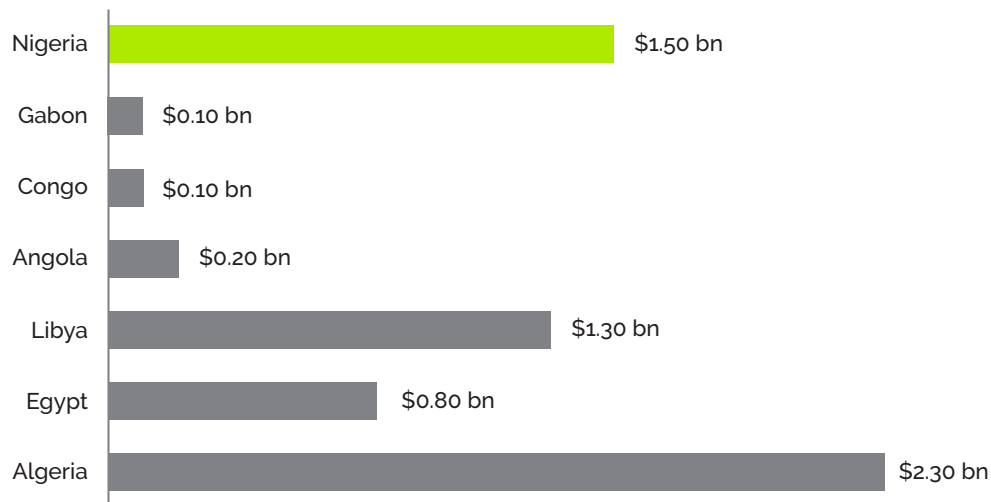
Stakeholders	Mendelow's mapping	Salience's mapping
Governments, commercial and environmental regulators, policymakers	High power/high interest	High salience
Oil and gas operators (production, processing, transmission/storage, distribution)	High power/high interest	High salience
Science and technology innovation (research and development (R&D))	Low power/high interest	Medium salience
Public international finance institutions	Low power/high interest	Medium salience
Private corporations and financial institutions	Low power/high interest	Medium salience
Civil society organizations, host communities, the international community	Low power/low interest	Low salience

Drawing from previous experiences and lessons learnt, the implementation of effective and sustained methane mitigation and reduction in Nigeria requires robust support and coordination among all relevant stakeholders.

Financing landscape

According to International Energy Agency (IEA) data on emissions spending needed by 2030 Figure A, US\$1.5 billion will be needed between 2023 and 2030 to reduce methane emissions within Nigeria's oil and gas sector. According to the report, oil and gas majors operating in the country have a responsibility to contribute US\$300 million to meet the target.

Figure A: IEA data on emissions spending needed by 2030



Source: IEA (2023), *Financing reductions in oil and gas methane emissions*, IEA, Paris

Policymakers hold the key to unlocking this vital capital at the global stage. Directing new grants and concessional resources towards the highest mitigation potential opportunities, particularly in challenging technological areas and geographical regions, can significantly impact the fight against methane emissions. However, sustainability is crucial. Sustained increases in public finance support are therefore needed to offer long-term confidence and truly unlock private investment in these hard-to-tap areas.

Observed challenges

Nigeria encounters multifaceted obstacles in mitigating methane emissions within its oil and gas sector. They are mapped out as follows:

- The establishment and enforcement of stringent regulatory frameworks proves daunting. For more holistic and effective methane mitigation across industry segments, there is a need for greater coordination between NUPRC and the Nigerian Midstream and Downstream Petroleum Regulatory Authority (NMDPRA).
- The complexity of stakeholder engagement exacerbates the issue. Divergent interests and priorities among government agencies, oil companies, local communities and environmental organizations hinder collaboration.
- Technological limitations and infrastructure gaps constrain the adoption of advanced methane capture and reduction technologies, further impeding progress in emission reduction and mitigation initiatives.
- The low interest in researching methane emissions by Nigerian academics and researchers has created a knowledge gap. Supporting research efforts in this area will lead to the development of more effective mitigation strategies tailored to the Nigerian context.

Opportunities

Implementing methane mitigation and reduction measures within Nigeria's oil and gas sector presents a myriad of opportunities with far-reaching benefits.

- Firstly, there are substantial economic advantages to be gained, as the adoption of methane mitigation and reduction measures can lead to cost savings for oil and gas companies.
- Through the recovery and sale of captured methane, as well as the potential revenue from carbon credits, these measures can bolster financial sustainability and competitiveness within the industry.
- Prioritizing methane reduction and mitigation contributes significantly to environmental sustainability, aligning with Nigeria's commitments to global climate change mitigation efforts.
- Effective methane mitigation directly translates to improved air quality in areas surrounding oil and gas operations, leading to reduced respiratory illnesses and healthcare costs for communities. This fosters a healthier, more resilient society.
- Investing in R&D of methane mitigation technologies will propel the growth of the clean energy sector, fostering technological innovation and creating new job opportunities in a sustainable industry.
- By demonstrating a strong commitment to methane reduction, Nigeria can elevate its international reputation and attractiveness for foreign investment in the oil and gas sector, fostering greater trust and collaboration on the global stage.
- The pioneering nature of Nigeria's methane regulations in the African oil and gas sector presents a valuable opportunity. This leadership role can facilitate the exchange of best practices and lessons learned with other oil-producing countries, both established and emerging. By fostering peer-to-peer knowledge sharing, Nigeria can contribute to a collective effort towards implementing effective methane mitigation and reduction measures across the continent. This, in turn, will empower new oil producers to adopt cleaner practices from the outset, accelerating progress towards a more sustainable oil and gas sector in Africa.

Key take-aways

Emissions context

- High methane emissions from the sector necessitate a transition to cleaner energy sources (solar, wind, blue economy) and reduced emissions from oil and gas production.
- Urgent action is needed to address rising methane emissions. Existing technologies and policies offer cost-effective solutions with immediate benefits.

Policy framework and coherence

- Ambitious and coherent methane action plans aligned with national development goals are essential.

- Policies should incentivize low-carbon investments, promote sustainable land use, and foster clean technology innovation to accelerate climate mitigation.
- Existing legislation lacks specific references to methane mitigation beyond gas flaring reduction targets.
- Existing Nigerian policies demonstrate some coherence with international commitments and national objectives for methane reduction.

Stakeholder engagement

- Public awareness and participation are critical for achieving climate mitigation goals.
- Education and outreach campaigns promoting climate-friendly behaviors (energy conservation, waste reduction, sustainable transport) are crucial.
- Effective implementation requires robust coordination among government, the private sector, civil society and research institutions.

Financial landscape

- An estimated US\$1.5 billion is needed between 2023–2030 to reduce methane emissions in Nigeria's oil and gas sector.
- Bridging the funding gap and scaling up investments are crucial to unlock the potential of methane mitigation as a climate solution.
- Policymakers play a key role in attracting investment by directing resources towards high-impact opportunities and challenging areas.
- Sustained public finance support is needed to provide long-term confidence and unlock private investment in these critical areas.

Stakeholder validation workshop

- Data-driven approach: Utilize satellite technology and establish independent data sources for robust emissions tracking and reporting.
- Policy development: Employ analytical tools like SWOT (Strengths, Weaknesses, Opportunities, Threats) and PEST (Political, Economic, Social, Technological) analyses to design holistic, data-driven methane mitigation policies.
- Comprehensive strategy: Address all segments of the oil and gas value chain, including midstream and downstream considerations, with a focus on innovative technologies, capacity building and public awareness.
- Collaboration and resource utilization: Leverage existing initiatives like SMET and NOSDRA programs and collaborate with bodies like the National Council on Climate Change (NCCC) to maximize impact.

- Actionable data: Disaggregate data and translate it into actionable insights for policymakers and stakeholders.
- Community protection: Integrate practical solutions for protecting host communities from methane emissions into mitigation strategies.
- Multi-level governance: Ensure inclusive engagement with relevant subnational agencies and stakeholders in oil-producing regions.

Potential pathways forward

To chart a successful course forward in mitigating methane emissions within Nigeria's oil and gas sector, several strategic pathways should be pursued.

- Nigeria should prioritize policy coordination among relevant government agencies, fostering collaboration to develop cohesive policies and regulations tailored to methane mitigation.
- Exploring innovative financial mechanisms by establishing a firm climate financing basis with the Federal Ministry of Finance and the Central Bank of Nigeria through public-private partnerships and green bonds can unlock much-needed investment for methane reduction projects, ensuring financial sustainability and scalability.
- Investing in capacity building and technology transfer initiatives is imperative to facilitate the adoption of methane reduction technologies and practices among local stakeholders, promoting widespread implementation and impact.
- Fostering inclusive stakeholder engagement processes that involve local communities, subnational and industry players, and environmental groups is essential to garner broader buy-in and support for methane mitigation initiatives, fostering a sense of ownership and commitment.
- Establishing robust monitoring and reporting mechanisms is paramount for tracking progress, verifying emissions reductions and ensuring accountability, underpinning the effectiveness and credibility of methane mitigation efforts.
- Support R&D: Encourage and invest in research focused on innovative methane mitigation technologies, best practices and cost-effective solutions specifically tailored to the Nigerian context. This will ensure continuous improvement and adaptation of mitigation strategies over time.

Introduction and background

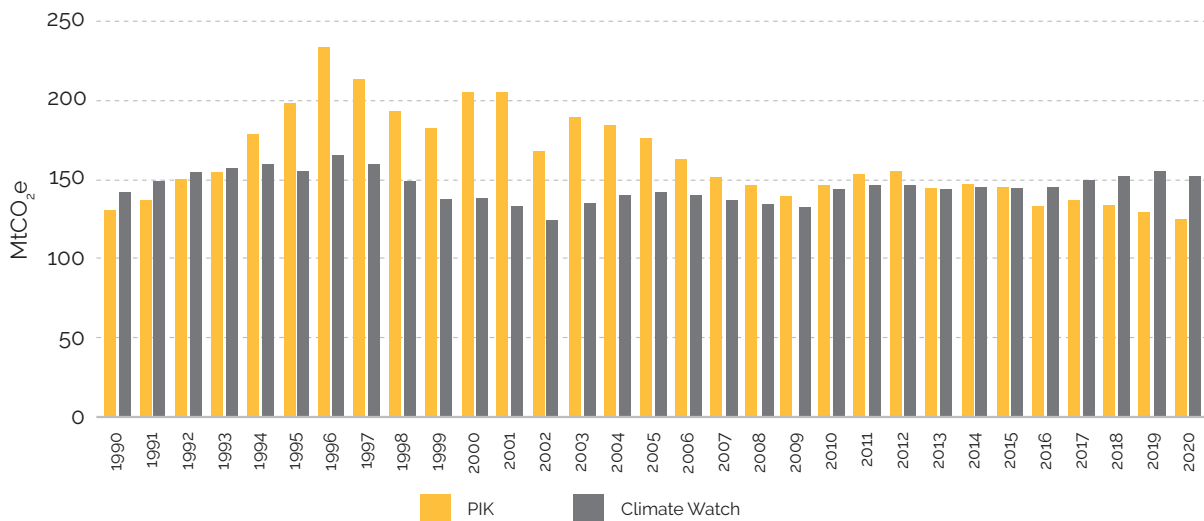
Context and background

Nigeria, situated in West Africa, is a federal republic comprising 36 states and the Federal Capital Territory, Abuja. With a population exceeding 200 million, it ranks as the most populous nation in Africa and the sixth globally.³ Economically, Nigeria is Africa's largest economy, with Gross Domestic Product (GDP) at approximately US\$535 billion.⁴ The economy is primarily driven by a diverse mix of agriculture, oil and gas production, manufacturing activities, and a growing services sector. The oil and gas sector, for instance, is Nigeria's mainstay as it fetches over 82.5% of the country's export value,⁵ 37% of 2022 federal government's revenue⁶ and about 6% of 2023 GDP.⁷

Climate Watch Data also supports these findings, showing that methane emissions from the oil and gas sectors in Nigeria have been increasing steadily since 2010. In 2020, methane emissions from the sector reached 152.95 million metric tons of CO₂ equivalent, MtCO₂e (see Figure 1). This is equivalent to about 41% of Nigeria's total greenhouse gas emissions.⁸ This increase is due to several factors, including the expansion of oil and gas production in Nigeria, leaks from oil and gas pipelines and infrastructure, and venting and flaring of natural gas.⁹

According to the Short-Lived Climate Pollutants (SLCPs) National Action Plan, methane emissions in Nigeria are expected to increase from 439.8 kilotonnes in 2010 to 481.2 kilotonnes in 2030, representing a 9% increase. Emissions are projected to peak in 2050 at 598.5 kilotonnes, reflecting a 36% increase from 2010 levels.¹⁰ These emissions include diverse activities such as gasoline distribution and handling, oil production, refining, transport, and gas production, processing and distribution. Notably, 27% of these emissions are associated with oil production, while a significant majority, 73%, emanate from gas production, processing and distribution.¹¹

Figure 1: Nigeria methane emissions from energy sources, comparison between PIK and Climate Watch, 1990–2020



Source: Climate Watch Historical Country Greenhouse Gas Emissions Data (2022). World Resources Institute.

While the oil and gas sector contributes significantly to the economy, it also accounts for a substantial portion of GHG emissions. In 2018, fugitive emissions from Nigeria’s oil and gas sector were the top source of GHG emissions within the energy sector, contributing a substantial 33% of the total 209 million tonnes of carbon dioxide equivalent (CO₂e) released.¹² This reliance of the Nigerian economy on the oil and gas sector and its contributions to the climate crisis call for a strategic and systematic approach to limit any negative consequences and to maximize potential benefits for people and the planet.

Reducing these emissions is essential for mitigating the effects of climate change, which implies supporting health and well-being in the country. The Nigerian government has taken some steps to reduce methane emissions from the oil and gas sector. In 2021, the government released the Guidelines for Management of Fugitive Methane and Greenhouse Gases Emissions in the Upstream Oil and Gas Operations in Nigeria.¹³ These guidelines mandate that oil and gas companies implement measures to reduce methane emissions, such as leak detection and repair (LDAR) programs and the use of high-destruction efficiency flares.

Likewise, the urgency of mitigating methane emissions has been emphasized by the Global Methane Pledge (GMP),¹⁴ an initiative launched at COP26 and expanded at COP28. In 2023, Nigeria’s commitment to the GMP was further solidified when the Director General of the National Council on Climate Change (NCCC) was appointed as a champion for the initiative. As a key strategy in the fight against climate change, the GMP promotes investments in methane reduction, offering significant environmental and societal benefits for both present and future generations.

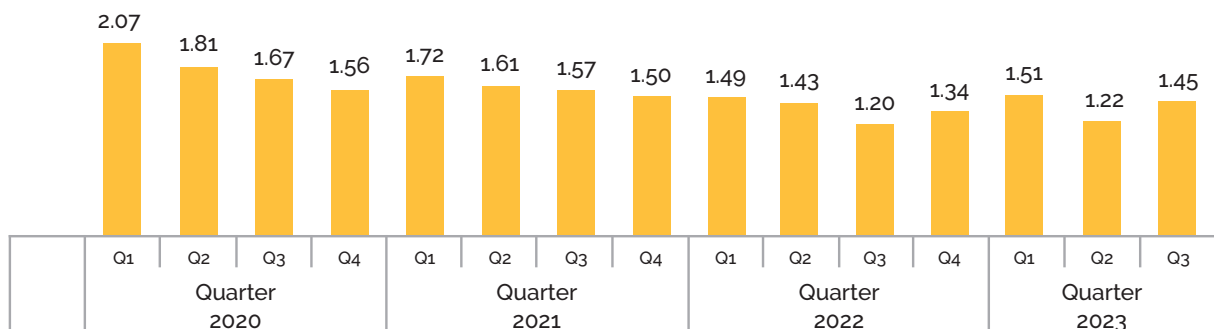
Overview of Nigeria's oil and gas sector

After a decade of anticipation, Nigeria's oil and gas sector finally witnessed a major overhaul with the passage of the Petroleum Industry Act (PIA) in July 2021. This landmark legislation aims to modernize regulations and fiscal structures, fostering greater transparency and efficiency. Industry experts anticipate the PIA will address long-standing issues related to production sharing agreements (PSAs), paving the way for several stalled projects. As called for in the PIA, the Nigeria National Petroleum Corporation (NNPC) has transited to a commercial entity operating as the Nigerian National Petroleum Company Limited (NNPCL). Under the regulatory reforms are institutional changes that have consolidated the previous upstream and downstream regulators into the Nigerian Upstream Petroleum Regulatory Commission (NUPRC) and the Nigerian Midstream and Downstream Petroleum Regulatory Authority (NMDPRA).

The PIA also repeals several outdated laws, streamlining regulations and potentially reducing administrative burdens. These include acts governing:

- Associated Gas Reinjection Act¹⁵
- Hydrocarbon Oil Refineries Act¹⁶
- Motor Spirit Returns Act¹⁷
- Nigerian National Petroleum Corporation (NNPC) Projects Act¹⁸
- NNPC Act (where NNPC ceases to exist under section 54(3) of the Act)
- Petroleum Products Pricing Regulatory (Establishment) Act
- Petroleum Equalization Fund Act
- Petroleum Profit Tax Act (PPTA)
- Deep Offshore and Inland Basin Production Sharing Contract Act.

Figure 2: Nigeria's oil production (mbpd)



Source: Nigerian Gross Domestic Product Q4 2023 Report. (2024, February). National Bureau of Statistics

Despite the landmark legislation, Nigeria's oil production has been on a downward trend since 2021, with average daily output dropping from 1.64 million barrels per day (mbpd) in Q1 2021 to 1.37 mbpd in Q4 2023.¹⁹ The sharpest drops occurred in Q3 2022 and Q2 2023 (see Figure 2), coinciding with reports of heightened oil theft, suggesting this issue plays a significant role in limiting production capacity and hindering Nigeria's ability to meet its Organization of the Petroleum Exporting Countries (OPEC) commitments. This discrepancy highlights ongoing challenges in the sector, including oil theft and pipeline vandalism, which continue to hamper Nigeria's ability to reach its full potential.

This problem significantly hinders the country's efforts to fulfill its increased OPEC quota of 1.83 mbpd, which came into effect in September 2022,²⁰ and capitalize on the current high energy prices following the Russia-Ukraine conflict. According to the NUPRC, in Q1 2022, the country lost an estimated US\$1 billion in revenue to crude theft.²¹ During this period, the country saw average daily oil theft increase from about 108 000 barrels per day (bpd), up from 103 000 bpd in 2021.²² In mid-June 2022, the Trans-Niger oil pipeline (TNP), which hauls 180 000 bpd across Nigeria, stopped transporting crude due to theft. However, in April 2023 Shell reported that after a year of TNP being shut down, it had plugged 460 illegal pipelines and resumed operations.²³

In addition to crude theft challenges, foreign participation in Nigeria's oil and gas sector faces several regulatory challenges. The Central Bank's foreign exchange controls and the Nigerian Content Act (NCA) present significant hurdles. The NCA sets limits on foreign management, mandates specific local participation in engineering, welding and fabrication, and restricts imports. While these pose barriers to entry, successful international companies employ effective strategies to manage them.

Additionally, foreign companies are required to register with relevant regulatory agencies (NUPRC or NMDPRA) depending on their activities. Recognizing the need for improved transparency, the government is overhauling the Nigerian Petroleum Exchange (NipeX) portal to enhance clarity in inventory management.

On 6 March 2024, gaps in Nigeria's oil and gas regulations led the president to sign executive orders initiating amendments of primary legislations in the sector regarding competitiveness and corruption, which pose challenges linked to regulatory and operational coherency in the Nigerian oil and gas landscape.

While the sector faces significant challenges, the recent launch of the Dangote refinery presents a line of hope. This US\$16 billion refinery is capable of refining 650 000 bpd, and could rewrite Nigeria's energy story.²⁴ From being a major importer, the nation could become a self-dependent refining champion. This step toward energy independence marks a turning point, but it also underlines the critical need for redoubled efforts to manage methane emissions and adapt to climate change. Growth in the energy sector should not come at the expense of greater methane emissions.

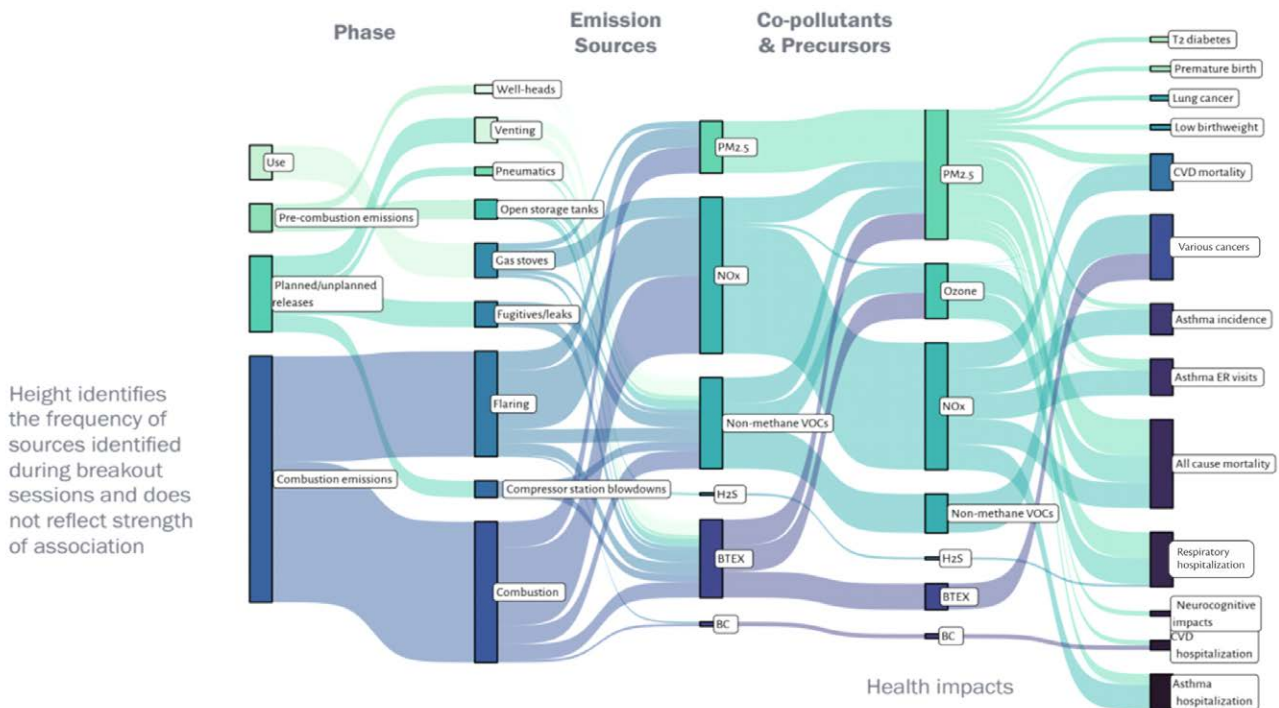
Importance of methane mitigation and reduction

The imperative to address methane emissions stems from a well-established scientific consensus on their detrimental impact on Earth's climate and human well-being.²⁵ Methane, with over 80 times the warming potency of CO₂ over a 20-year span, significantly contributes to global warming, necessitating accelerated reductions to meet the 1.5°C or 2°C temperature targets set by the Intergovernmental Panel on Climate Change (IPCC) by 2030.²⁶

Methane emissions from the oil and gas sector can be categorized as either “fugitive” or “vented/ flared.” Fugitive emissions are unintentional leaks from equipment like pumps and valves, while “vented” methane escapes directly from storage tanks, often carrying harmful co-pollutants like Volatile Organic Compounds (VOCs)²⁷ and BTEX (benzene, toluene, ethylbenzene and xylene).²⁸ In some cases, particularly during oil extraction, methane is intentionally “flared” to burn off excess gas, releasing co-pollutants such as Nitrogen Oxides (NOx)²⁹ and Particulate Matter 2.5 (PM_{2.5}).³⁰ Regardless of the source, these methane emissions and their associated co-pollutants can have detrimental impacts on human health (see Figure 3). For example, a study investigating the long-term health effects of PM_{2.5} found a positive correlation between exposure and the incidence of ischemic heart disease in older adults, smokers and individuals with pre-existing conditions like high blood pressure and diabetes.³¹ Higher PM_{2.5} concentrations strengthened the association.³²

Global action to reduce methane emissions has additional benefits for human health, food security and ecosystems, as it can curb the formation of tropospheric ozone, an air pollutant with multiple harmful impacts. A study from Abt Global illustrates the social benefits of prioritizing investments in methane abatement.³³ Abt Global explored 16 out of over 40 methane reduction solutions in energy, agriculture and waste sectors. Collectively, these 16 technologies could help reduce 20% of annual methane emissions by 2050. The social benefits of eliminating methane over this period could be between US\$3 000 and US\$3 100 per tonne, signifying the monetary value of the harm that could be avoided if methane emissions are reduced.³⁴

Figure 3: An alluvial chart showing the co-pollutants and precursors that emerge from specific sources within the oil and gas value chain and their interactions and subsequent impacts upon human health



Source: Methane and Health (Dialogue Series), Environmental Defense Fund, 2023

According to the Climate and Clean Air Coalition (CCAC) Secretariat, methane plays a crucial role in the formation of ground-level ozone, a major component of smog and a serious public health hazard.³⁵ Reducing methane emissions by 45% within this century, a realistic possibility, has the potential to prevent an astonishing 260 000 premature deaths in Nigeria.³⁶ Importantly, the sector, a significant contributor to methane emissions, also presents one of the most fertile grounds for impactful action.

Beyond its critical role in climate action, mitigating methane emissions presents a strategic opportunity to achieve multiple sustainable development goals (SDGs) and broader development objectives, generating significant co-benefits for human capital and economic development (Table 1).

Table 1: Alignment of methane mitigation with SDGs

SDG	Description	Co-benefits of methane mitigation
3: Good health and well-being	Ensure healthy lives and promote well-being for all ages.	Improved air quality near oil and gas operations and waste management facilities, leading to reduced respiratory illnesses and healthcare costs.
13: Climate action	Take urgent action to combat climate change and its impacts.	Reduction in a potent GHG, contributing significantly to curbing global warming, safeguarding food security (SDG 2), water resources (SDG 6) and ecosystems (SDG 15).
2: Zero hunger	Achieve food security and sustainable agriculture.	Optimized resource use in agriculture, leading to increased food production and improved livelihoods for farmers (SDGs 1 & 8).
7: Affordable and clean energy	Ensure access to affordable, reliable, sustainable and modern energy for all.	Generation of valuable co-products like biogas and electricity, contributing to clean energy access and economic development (SDG 8).
10: Reduced inequalities	Reduce inequality within and among countries.	Addressing a potent climate pollutant allows for faster progress towards achieving the Paris Agreement goals, contributing to a more sustainable and equitable future for all (SDG 17).

Source: Author's compilation

Purpose of methane mitigation and reduction landscape mapping in Nigeria's oil and gas sector

The overarching purpose of this mapping report is to comprehensively examine and evaluate the landscape of methane mitigation and reduction efforts within Nigeria's oil and gas sector. Through a structured analysis across multiple dimensions, this report provides a holistic understanding of the current state, challenges, opportunities and potential pathways for enhancing methane mitigation strategies in alignment with national priorities and global climate action imperatives.

In particular, the objectives of the methane mitigation mapping report are as follows:

- **Understanding the landscape:** The report presents a general overview of Nigeria's oil and gas sector, analyzing the recent trends and background. It assesses national priorities and urgency within the climate action agenda and summarizes existing research on methane mitigation in the oil and gas sector, exploring potential benefits and synergies with broader climate strategies and SDGs.

- **Assessing existing policy frameworks:** The report reviews Nigeria's methane mitigation policy framework, analyzing its Nationally Determined Contribution (NDC), national and regional policies, sectoral focus, implementation strategies and project case studies. It evaluates alignment, effectiveness and potential for improvement, aiming to illuminate strengths, weaknesses and opportunities for progress.
- **Mapping of stakeholders:** The report maps the diverse stakeholders involved in methane mitigation across all levels, from international organizations to local communities, including both government and non-governmental entities. Analyzing their roles and involvement reveals collaboration dynamics, identifies gaps and assesses partnership effectiveness, guiding future efforts towards a unified agenda against methane emissions.
- **Methane financing landscape:** The report dives deep into the financial landscape of methane mitigation in Nigeria's oil and gas sector, analyzing funding sources, distribution and effectiveness. By identifying gaps and opportunities, the aim is to optimize financing strategies for tackling emissions and achieving national priorities.
- **Synthesizing findings and recommendations:** This final section binds the entire document by synthesizing and analyzing the effectiveness of current policies, strategies and financing, and identifying gaps and opportunities. It also identifies potential best practices for advancing methane mitigation and highlights how these efforts can align with broader national development and climate action plans, as well as roadmaps for achieving sustainable and impactful methane reduction and mitigation in Nigeria's oil and gas sector.

Methodology and approach

This report uses a mixed-method research approach in combination with several tools. It is built on early-stage stakeholder engagement, robust desktop research, and a national stakeholders' workshop to provide a holistic understanding of the current state, challenges, opportunities and potential pathways for enhancing methane mitigation strategies in alignment with national priorities and global climate and sustainable development goals.

The approach and methodology adopted for this task was designed to make the procedure compatible with Nigeria's context and realities. The methodology ensured that the approach is representative and captures the entire landscape (policies, regulatory frameworks, strategies, finance and stakeholder layout) of Nigeria's oil and gas sector. The following steps were taken to achieve the detailed objectives set for this report:

- **Early-stage stakeholder engagement:** The state-of-play and fact-finding mission started by engaging relevant stakeholders based on their role in the oil and gas sector. The interactions with the ministries, departments and agencies (MDAs) of government, like the Department of Climate Change of the Federal Ministry of Environment, provided basic information and guidelines on the current operational and regulatory practices in the sector.
- **International-level review:** This task reviewed existing efforts to combat methane emissions on international, regional, and national levels. This included initiatives documented by organizations like the Global Methane Initiative and the International Energy Agency (IEA) (methane tracking and best policy/regulatory models³⁷). Desktop research also leveraged relevant blogs and insight reports for data sources.
- **National-level review:** This task focused primarily on a review and analysis of stakeholders, financial architecture and flows, draft strategy, laws, policy and regulatory documents from the Nigerian government that form the current policy and regulatory environment with respect to methane. Among others, the following policies and legislations were reviewed: the NDC; Climate Change Act; Petroleum Act 1969; 2021 PIA; SLCP National Action Plan; Draft Guidelines for Reducing Methane Emissions from the Oil and Gas Operations in Nigeria 2021/2022; Gas Flaring, Venting, and Methane Emissions (Prevention of Waste and Pollution) Regulations (Federal Government of Nigeria, 2023); Associated Gas (Re-injection) Act 1979 (AGRA) and Associated Gas Re-injection (Continued Flaring of Gas) Regulations 1985; Environmental Guidelines and Standards for the Petroleum Industry in Nigeria (EGASPIN) 2018; Flare Gas (Prevention of Waste and Pollution) Regulations (Federal Government of Nigeria, 2018); Nigerian Gas Flare Commercialization Programme (NGFCP) 2016 and Nigerian Gas Policy and

Nigeria Gas Masterplan 2017; Nigeria's Climate Change Policy (NCCP) issued in June 2021; addition of fugitive methane emission monitoring and LDAR in revision of the Mineral Oils (Safety) Regulations (MOSR) 1997 as well as in the draft Petroleum Industry Environmental Regulation (PIER) 2019.

- National stakeholder validation workshop: Upon completion of the draft mapping report, a national stakeholder validation workshop was convened. The meeting was designed to be a hybrid event and attracted 96 in-person and 59 online participants. This included high-level government officials such as the Honorable Minister of State and the Permanent Secretary from the Federal Ministry of Environment. It was also attended by other policymakers and relevant stakeholders from across the private sector and various MDAs, including:
 - Representatives of Nigeria's Presidency
 - Federal Ministry of Environment
 - Federal Ministry of Petroleum Resources
 - Nigerian Upstream Petroleum Regulatory Commission
 - Nigerian Midstream and Downstream Petroleum Regulatory Agency
 - Federal Ministry of Science and Technology
 - Nigerian Governors' Forum
 - National Oil Spill Detection and Response Agency
 - Clean Air Task Force
 - Civil society organizations
 - Oil and gas value chains
 - Media representatives.

Key elements of the mapping

This section details the key elements of the mapping report: policies, regulatory frameworks, strategies, finance and stakeholder layout of methane mitigation and reduction efforts within Nigeria's oil and gas sector. Through a structured analysis across multiple dimensions, this section provides a holistic understanding of the current state, challenges, opportunities and potential pathways for enhancing methane mitigation strategies in alignment with national priorities and global climate action imperatives.

International commitments

In the past few years, Nigeria has taken a leading role on the regional and global stage in implementing measures to address emissions from the oil and gas sector. Internationally, Nigeria is a member of the Global Flaring and Methane Reduction Partnership (GGFR) and a supporter of the Zero Routine Flaring by 2030 initiative. Data from an initiative led by the World Bank shows that Nigeria has successfully reduced natural gas flaring by approximately 70% since 2000.³⁷ Table 2 highlights Nigeria's international commitments relevant to methane mitigation.

Table 2: Nigeria's international commitments to methane mitigation and reduction

Party/Initiatives	Pledge and declarations
Climate and Clean Air Coalition (CCAC) ³⁸	Nigeria is a member of the CCAC, a global coalition of governments, intergovernmental organizations, businesses and civil society organizations committed to addressing climate change and air pollution. The CCAC has a specific working group focused on reducing methane emissions, and Nigeria actively participates in this working group.
Global Gas Flaring Reduction Partnership (GGFR) and Zero Routine Flaring by 2030 Initiative ³⁹	GGFR40 seeks a world free of routine gas flaring and venting. GGFR helps identify solutions to the array of technical and regulatory barriers to flaring reduction. To achieve this, the partnership develops country-specific flaring reduction programs, conducts research, shares best practices, raises awareness, secures global commitments to end routine flaring, and advances flare measurements and reporting. Nigeria has endorsed the Zero Routine Flaring by 2030 Initiative, a World Bank-led initiative to eliminate routine flaring of associated natural gas by 2030.
Global Methane Alliance (GMA) ⁴¹	Nigeria joined the GMA in 2019 at a high-level meeting hosted by the CCAC and the United Nations Environment Programme. Countries that join the alliance commit to absolute methane reduction targets of at least 45% by 2025 and a 60–75% reduction by 2030, though this depends on their oil and gas sector and overall methane emissions.
Global Methane Initiative (GMI) ⁴²	Nigeria is a partner of the GMI, a US-led initiative that provides technical and financial support to developing countries to reduce methane emissions from the oil and gas sector. The GMI aims to reduce emissions in the oil and gas sector between 2020 and 2050. Specifically, there is a target to reduce emissions by 25,917 MMTCOe in 2020, followed by further reductions by 26,243 MMTCOe in 2035 and 27,246 MMTCOe in 2050.

Party/Initiatives	Pledge and declarations
Oil and Gas Methane Partnership (OGMP) ⁴³	An EU-US-led effort gathering 150 countries to reduce global methane emissions by 30% by 2030. ⁴⁴ In 2022, Nigeria joined the OGMP 2.0, ⁴⁵ a global initiative to reduce methane emissions from the oil and gas sector. As part of this initiative, Nigeria committed to measuring and reporting methane emissions from its oil and gas operations, implementing methane emission reduction technologies, and developing regulations to reduce methane emissions.
United Nations Framework Convention on Climate Change (UNFCCC) ⁴⁶	Nigeria is a signatory to the Paris Agreement. At COP21 (2015), Nigeria submitted its first NDC ⁴⁷ to the Paris Agreement, which includes a commitment to reduce methane emissions by 45% from 2010 levels by 2030. COP26 Glasgow Climate Pact: In 2021, Nigeria reaffirmed its commitment to the Paris Agreement and joined the Global Methane Pledge, a voluntary initiative to reduce methane emissions by 30% from 2020 levels by 2030. ⁴⁸

Source: Various; Author's analysis

Policy instruments on methane mitigation and reduction in Nigeria

At COP26, President Muhammadu Buhari announced Nigeria's commitment to net zero by 2060, and subsequently signed the Climate Change Act 2021, which was passed into law by the National Assembly in October 2021. This illustrates Nigeria's commitment to the Paris Agreement. While this set the national pace, there are several other complementing policy instruments from the Nigerian government that broadly set the principles and goals on mitigating methane emissions in the oil and gas sector (Table 3).

Table 3: Enacted policies and regulations

Policy instruments	Description	Intended role
Associated Gas (Re-injection) Act 1979 (AGRA)	AGRA is a Nigerian law aimed at reducing methane emissions in the oil and gas sector by mandating the re-injection of associated gas produced alongside crude oil. This gas, rich in methane, is often flared, contributing significantly to GHG emissions and air pollution.	<p>Minimize flaring: AGRA compels oil and gas companies to submit plans for re-injecting associated gas back into oil reservoirs or utilizing it for other beneficial purposes like power generation or industrial use.</p> <p>Reduce methane emissions: By minimizing the practice of flaring, AGRA aims to significantly decrease methane emissions from the oil and gas sector, contributing to climate change mitigation and improved air quality.</p> <p>Promote resource efficiency and economic benefits: Re-injecting or utilizing associated gas can be more economically viable than flaring, potentially leading to cost savings for companies and increased government revenue from gas sales.</p>
National Oil Spill Contingency Plan (NOSCP) ⁴⁹	The NOSCP for Nigeria, revised in 2020, outlines a comprehensive framework for prevention, preparedness and response in relation to oil and gas spills in Nigeria. The plan aims to minimize the environmental, social and economic impacts of oil spills and gas flares by providing a coordinated and effective response to these incidents.	<p>Protect human health and safety by minimizing exposure to oil spills and their associated hazards.</p> <p>Enforce all environmental laws in the oil and gas sector.</p> <p>Minimize environmental impacts by preventing oil spills from reaching sensitive areas and habitats.</p> <p>Restore the environment to its pre-spill condition, as far as practicable, through the removal of oil and the rehabilitation of affected ecosystems.</p> <p>Minimize economic losses by ensuring a prompt and effective response to oil spills, thereby reducing the costs of clean-up and restoration.</p> <p>Enhance public awareness of oil spill prevention and response measures.</p> <p>Strengthen institutional capacity for oil spill prevention and response.</p>

Policy instruments	Description	Intended role
Nigerian Gas Flare Commercialization Programme (NGFCP) 2016 ⁵⁰ and National Gas Policy ⁵¹ and Nigeria Gas Masterplan 2017 ⁵²	<p>The NGFCP 2016 is a market-based initiative aiming to eliminate routine gas flaring in Nigeria's oil and gas sector. It incentivizes private investment by issuing permits to utilize flared gas, fostering economic development and environmental benefits.</p> <p>The National Gas Policy 2017 is a comprehensive policy document outlining the government's vision for the gas sector, focusing on increased gas production, utilization and monetization. It establishes principles and strategies for achieving these goals.</p> <p>The National Gas Masterplan 2017 is a roadmap for implementing the National Gas Policy, outlining specific strategies, projects and timelines for achieving the desired outcomes. It provides a blueprint for sector development and investment.</p>	<p>End gas flaring: Reduce environmental damage and GHG emissions associated with flaring.</p> <p>Attract investment: Stimulate new businesses and ventures utilizing recovered gas, diversifying the economy and creating jobs.</p> <p>Increase gas monetization: Convert a wasted resource into valuable economic benefit, generating revenue for the government and investors.</p> <p>Diversify the gas market: Promote increased domestic gas usage for power generation, industrial feedstock and other applications, reducing reliance on oil.</p> <p>Ensure efficient pricing: Establish a transparent and market-based gas pricing framework to attract investment and optimize resource allocation.</p> <p>Guide infrastructure development: Prioritize and facilitate the construction of key gas infrastructure like pipelines, storage facilities and processing plants.</p>
Environmental Guidelines and Standards for the Petroleum Industry in Nigeria (EGASPIN) 2018 Revision	EGASPIN 2018 is a policy document outlining broad environmental goals and best practices for the oil and gas sector. It aims to guide companies towards sustainable operations and minimize their environmental impact.	<p>Promote responsible environmental stewardship: EGASPIN encourages companies to adopt an environmentally conscious approach throughout their operations, embracing principles like pollution prevention, waste minimization and ecosystem conservation.</p> <p>Promote stakeholder engagement: The policy encourages companies to engage with stakeholders, including communities, non-governmental organizations (NGOs) and government agencies, in environmental decision-making and impact management.</p>
Nigeria's National Action Plan to Reduce Short-Lived Climate Pollutants (SLCPs) ⁵³	Nigeria's National Action Plan to reduce SLCPs announced in 2018 serves as a comprehensive strategy to address the country's contributions to climate change by reducing emissions of SLCPs, particularly methane. The SLCP action plan specifically targets methane emissions from the oil and gas sector, a major source of methane in Nigeria.	The key purpose of the SLCP action plan is to reduce methane emissions by 60% by 2030. The emission reduction potential resulting from the implementation of the oil and gas SLCPs abatement measures for methane suggests methane emission reductions of 14.7kt in 2020 to 103kt and 161.09kt in 2030 and 2050 respectively, representing a 50% reduction in methane emissions from this sector. This ambitious goal aligns with the global effort to mitigate climate change and aligns with Nigeria's commitment under the Paris Agreement.
Nationally Determined Contribution (NDC) ⁵⁴	<p>Nigeria's NDC represents the country's commitment to reducing GHG emissions and addressing climate change under the Paris Agreement. The NDC outlines a range of mitigation measures, including targets for reducing methane emissions from key sectors such as oil and gas, agriculture and waste.</p> <p>In its updated NDC, submitted in 2021, Nigeria set an ambitious target of reducing methane emissions by 60% by 2030 compared to business-as-usual scenarios. This target is conditional upon international support in terms of finance, technology and capacity building.</p>	<p>Guides national climate action: The NDC sets the direction and priorities for national efforts to reduce methane emissions, influencing policy development and resource allocation across various sectors.</p> <p>Mobilizes stakeholders: The ambitious target and clear strategies serve as a rallying point for government agencies, private companies, civil society organizations and the public, encouraging collaboration and action.</p> <p>Tracks progress and identifies gaps: Regularly monitoring and reporting on progress towards the NDC target helps assess the effectiveness of implemented strategies, highlight areas needing improvement and inform future policy adjustments.</p>

Policy instruments	Description	Intended role
Nigeria's Climate Change Policy (NCCP) ⁵⁵	Issued in June 2021, the NCCP serves as a comprehensive framework to address the nation's climate change challenges and achieve sustainable development. The policy aims to foster a low-carbon, climate-resilient economy while ensuring equitable and inclusive growth.	<p>Mitigating GHG emissions: The policy aligns with the NDC to reduce emissions by 20% by 2030 compared to business-as-usual scenarios.</p> <p>Enhancing climate resilience: The NCCP emphasizes building resilience across various sectors, including agriculture, water resources and infrastructure.</p> <p>Promoting sustainable development: The policy aims to integrate climate change considerations into national and sectoral planning processes.</p>
Petroleum Industry Act (PIA) 2021 ⁵⁶	PIA 2021, while containing regulatory elements, also has a significant policy dimension. This aspect of the Act focuses on setting the direction and guiding principles for the oil and gas sector in Nigeria. The Act was enacted to address the shortcomings of the Petroleum Act 1969 and to create a more conducive environment for investment, growth and development in the oil and gas sector. In particular, the Act promotes openness and ethical conduct within the sector through measures like public reporting, open bidding processes and clear licensing procedures.	<p>The Act establishes a shared vision for a more transparent, accountable, efficient and sustainable oil and gas sector that benefits both the Nigerian economy and its citizens.</p> <p>The Act serves as a framework for developing more specific policies and regulations in different areas of the industry, translating these broad principles into concrete actions.</p>
Climate Change Act (CCA) 2021	<p>The CCA 2021 seeks to provide a framework for achieving low GHGs, inclusive green growth and sustainable economic development by:</p> <ul style="list-style-type: none"> (a) ensuring that Nigeria formulates programs for achieving its long-term goals on climate change mitigation and adaptation; (b) facilitating the coordination of climate change action needed to achieve long-term climate objectives; (c) mainstreaming climate change actions in line with national development priorities; (d) facilitating the mobilization of finance and other resources necessary to ensure effective action on climate change. 	<p>In addition to (a)–(d), the Act also is poised to:</p> <ul style="list-style-type: none"> (e) ensure that climate change policies and actions are integrated with other related policies for promoting socio-economic development and environmental integrity; (f) set a target for the years 2050–2070 for the attainment of a net zero GHG emission, in line with Nigeria's international climate change obligations; (g) identify risks and vulnerabilities, build resilience and strengthen existing adaptive capacities to the impacts of climate change; (h) implement mitigation measures that promote a low-carbon economy and sustainable livelihoods; (i) ensure that private and public entities comply with stated climate change strategies and targets and the National Action Plan.
Nigeria's Energy Transition Plan (ETP) ⁵⁷	<p>The ETP is a home-grown, data-backed, multipronged strategy developed for the achievement of net zero emissions in terms of the nation's energy consumption.</p> <p>The ETP sets out a timeline and framework for the attainment of emissions reduction across five key sectors: power, cooking, oil and gas, transport, and industry.</p>	<p>The ETP outlines a broad vision for transforming Nigeria's energy sector towards net zero emissions by 2060. It also establishes ambitious goals for increasing renewable energy deployment, reducing gas flaring and achieving universal access to energy.</p> <p>The plan lays out guiding principles for the transition, such as affordability, inclusivity and a just transition, ensuring a fair and equitable approach for all stakeholders.</p>
Nigeria's 2050 Long-Term Vision (LTV-2050) ⁵⁸	Nigeria's LTV-2050 outlines a comprehensive strategy for achieving a low-carbon, climate-resilient, high-growth circular economy by 2050.	The vision includes a specific target to reduce emissions by 50% by 2050 and achieve net zero emissions across all sectors of development by 2070.

Source: Various; Author's analysis

Regulatory frameworks on methane mitigation and reduction in Nigeria

This section examines the enacted and draft strategies, laws and regulatory documents from the Nigerian government that form the current regulatory environment with respect to methane. Table 4 outlines the regulatory frameworks analyzed.

Table 4: Nigeria's regulatory frameworks on methane mitigation and reduction

Regulatory framework	Description	Implementation aspect	Progress
Petroleum Industry Act (PIA) 2021	<p>Exploration and production: Setting licensing procedures, royalty and tax regimes, environmental standards and safety regulations.</p> <p>Midstream and downstream operations: Governing transportation, refining, marketing and distribution activities focusing on gas utilization and flaring reduction.</p> <p>Institutional governance: The Act establishes several new institutions, including the Nigerian Upstream Petroleum Regulatory Commission (NUPRC) and the Nigerian Midstream and Downstream Petroleum Regulatory Authority (NMDPRA), which will be responsible for regulating the midstream and downstream segments of the oil and gas sector, respectively.</p> <p>Empowering newly established regulatory bodies (NUPRC and NMDPRA) to grant licenses, collect fees, enforce compliance and impose penalties for non-compliance.</p> <p>Environmental protection: Strengthening environmental regulations, requiring environmental impact assessments, and mandating cleaner technologies and emission reduction measures.</p>	<p>Institutional framework: The PIA establishes new institutions like the NUPRC and the NMDPRA to handle regulatory functions previously divided among various agencies. This restructuring is still ongoing.</p> <p>Fiscal framework: The PIA introduces a new fiscal regime with royalty rates, taxes and other levies based on different oil and gas activities and contracts. Implementing these new fiscal terms is ongoing and requires negotiations with stakeholders.</p> <p>Host community development: The Act mandates the creation of Host Community Development Trusts (HCTs) to manage funds for development projects in oil-producing communities. Establishing these trusts and ensuring transparent fund management is a continuous process.</p> <p>Environmental regulations: The PIA strengthens environmental regulations and requires companies to adopt stricter environmental standards and practices. Implementing and enforcing these new standards is crucial.</p> <p>Transparency and accountability: The PIA emphasizes transparency in the sector by requiring companies to disclose more information and mandating open bidding processes for licenses and contracts. Ensuring effective implementation of these transparency measures is ongoing.</p>	<p>Ministerial inaugurations: The Ministers for Petroleum Resources and State Petroleum Resources have been inaugurated, leading the implementation process.</p> <p>Regulatory commissions: The NUPRC and NMDPRA have been inaugurated and are working on establishing their structures and processes.</p> <p>Draft regulations: Draft regulations for various aspects of the PIA, like licensing and fiscal terms, have been released for public consultations and feedback.</p> <p>Host community development: The process of establishing HCTs in oil-producing communities has begun, with pilot projects underway.</p> <p>Transparency initiatives: The government has launched initiatives like the National Data Repository and the Petroleum Licensing Round to promote transparency.</p>

Regulatory framework	Description	Implementation aspect	Progress
<p>Flare Gas (Prevention of Waste and Pollution) Regulations, 2018</p>	<p>The Flare Gas (Prevention of Waste and Pollution) Regulations, 2018,⁵⁹ were enacted to address the environmental and economic impacts of gas flaring in Nigeria. Gas flaring, the practice of burning excess natural gas produced alongside oil, is a major source of air pollution and GHG emissions. The regulations aim to reduce gas flaring by promoting gas utilization or re-injection and imposing penalties for non-compliance.</p>	<p>Stricter flaring prohibition: Routine flaring is completely banned, except for safety emergencies, lack of economic utilization options with proven feasibility studies, and technical limitations verified by independent experts.</p> <p>Permitting system: Companies seeking exceptional flaring permits must follow a rigorous process with stringent criteria and conditions.</p> <p>Incentivizing utilization: Regulations impose heavy fines for non-compliance and set progressive gas utilization targets, encouraging companies to invest in alternatives like power generation, gas-to-liquid projects or re-injection.</p> <p>Transparency and accountability: Detailed reporting requirements mandate companies to disclose gas production, utilization, flaring data and feasibility studies. Government agencies have the authority to inspect, investigate and enforce regulations.</p>	<p>Reduced flaring: Gas flaring has decreased since the regulations were implemented, though not as drastically as anticipated.</p> <p>Increased gas utilization: Investments in gas utilization projects like power generation and gas-to-liquid facilities have increased.</p> <p>Improved transparency: Reporting requirements have enhanced transparency in gas flaring practices.</p> <p>Legal challenges: Some provisions of the regulations have faced legal challenges, creating uncertainties.</p> <p>Enforcement challenges: Effectively enforcing the regulations and ensuring compliance across all operators remains a challenge.</p>
<p>Gas Flaring, Venting and Methane Emissions (Prevention of Waste and Pollution) Regulations, 2023</p>	<p>These regulations establish a comprehensive framework for minimizing gas flaring and venting, as well as controlling methane emissions in Nigeria's oil and gas sector.</p>	<p>Phase-in approach: The regulations have been implemented in phases, with stricter requirements coming into effect over time.</p> <p>Permitting system: A robust permitting system for flaring and venting gas is established, requiring technical feasibility studies and public consultations.</p> <p>Financial penalties: Significant fines are imposed for non-compliance or increasing the volume of gas flared or vented.</p> <p>Reporting requirements: Companies are required to submit detailed data on gas production, utilization, flaring, venting and methane emissions.</p> <p>Safety flaring: Limited exceptions for safety flaring are allowed under strict conditions.</p> <p>Gas utilization and monetization: Emphasis is placed on maximizing gas utilization through various options like power generation, gas-to-liquid conversion and injection into gas pipelines.</p>	<p>Regulations published in July 2023. The regulations are new, and full implementation is still ongoing.</p> <p>Initial positive reactions: Industry stakeholders have expressed support for the regulations, acknowledging their potential to reduce emissions and promote gas utilization.</p> <p>Guidelines issued: Supplementary guidelines have been released for specific aspects like flare gas measurement and reporting obligations.</p> <p>Permitting process underway: Regulatory agencies have begun accepting applications for permits for gas flaring and venting.</p>

Regulatory framework	Description	Implementation aspect	Progress
<p>Nationally Determined Contribution (NDC)</p>	<p>In its updated NDC,⁶⁰ submitted in 2021, Nigeria set an ambitious target of reducing methane emissions by 60% by 2030 compared to business-as-usual scenarios. This target is conditional upon international support in terms of finance, technology and capacity building.</p> <p>The NDC acts as a reference point for policymakers and regulatory bodies when developing new regulations or revising existing ones. They can align these regulations with the NDC's goals and strategies.</p> <p>As part of the Paris Agreement, the NDC strengthens the existing international legal framework for climate action. This indirectly influences the development of national regulations that align with global standards and agreements.</p>	<p>Multi-sectoral approach: The NDC focuses on various sectors like energy, agriculture, waste management and land use, requiring collaboration across government agencies and stakeholders.</p> <p>Mitigation and adaptation strategies: The plan outlines specific strategies for reducing emissions (mitigation) and building resilience to climate impacts (adaptation).</p> <p>Monitoring and reporting: Regular monitoring and reporting mechanisms track progress towards NDC goals and identify areas needing improvement.</p> <p>Financing: The NDC identifies potential funding sources for implementing the strategies, including public and private investments, climate finance mechanisms and carbon markets.</p>	<p>Updated NDC in 2021: Nigeria increased its ambition in its updated NDC, raising its unconditional emission reduction target to 20% below business-as-usual by 2030 and proposing a 47% conditional target with international support.</p> <p>Policy and regulatory frameworks: Development and implementation of policies like the Energy Transition Plan and the Nationally Appropriate Mitigation Actions (NAMA) contribute to NDC implementation.</p> <p>Renewable energy investments: Increased investments in renewable energy projects like solar and wind power contribute to emissions reduction.</p> <p>Climate-smart agriculture initiatives: Efforts to promote climate-resilient agricultural practices and reduce deforestation support adaptation goals.</p>
<p>National Oil Spill Contingency Plan (NOSCP)</p>	<p>The NOSCP for Nigeria, revised in 2020,⁶¹ outlines a comprehensive framework for the prevention, preparedness and response to oil spills in Nigeria. The plan aims to minimize the environmental, social and economic impacts of oil spills by providing a coordinated and effective response to these incidents.</p>	<p>Multi-level framework: The NOSCP outlines responsibilities at national, state and local levels, involving various government agencies, industry players and communities.</p> <p>Prevention, preparedness, response and recovery: The plan covers the entire oil spill lifecycle, emphasizing prevention measures, preparedness training, effective response strategies and long-term recovery efforts.</p> <p>Tiered response system: Depending on the spill size and location, a tiered response system activates different levels of resources and expertise.</p> <p>Community engagement: The plan encourages community participation in preparedness, response and recovery activities.</p>	<p>Developments in response equipment: Investments have been made in equipment like dispersants, skimmers and booms to improve response capabilities.</p> <p>Increased training and drills: More frequent training exercises and drills have enhanced emergency response skills and coordination among stakeholders.</p> <p>Improved communication protocols: Communication frameworks have been established to facilitate information sharing during spill incidents.</p> <p>Community awareness programs: Initiatives have been launched to raise awareness about oil spills and promote community preparedness.</p> <p>Development of Incident Command Systems for oil and gas pollution management: This includes the planned quarterly review and guarding against the use of enclosed combustors that leaves regulators heavily reliant on oil and gas companies' own flaring data.</p> <p>To monitor energy companies operating in Nigeria to prevent them from installing technologies that could stop researchers from identifying methane, carbon dioxide emissions and pollutants at industrial facilities involved in the disposal of unprofitable natural gas, known in the industry as flaring. The National Oil Spill Detection and Response Agency (NOSDRA) is working to check oil and gas equipment intended to cut methane emissions that in fact prevents scientists from accurately detecting GHGs and pollutants, which satellite image investigation has revealed.</p>

Regulatory framework	Description	Implementation aspect	Progress
<p>Nigeria's National Action Plan to Reduce SLCPS⁶²</p> <p>Reduce Short-Lived Climate Pollutants (SLCPS)</p>	<p>Nigeria's National Action Plan to Reduce SLCPS⁶² serves as a comprehensive strategy to address the country's contributions to climate change by reducing emissions of SLCPS, particularly methane. The SLCP action plan specifically targets methane emissions from the oil and gas sector, a major source of methane in Nigeria.</p> <p>The key purpose of the SLCP action plan is to reduce methane emissions by 60% by 2030. The emission reduction potential resulting from the implementation of the oil and gas SLCPS abatement measures for methane suggest methane emission reductions of 14,7kt in 2020 to 103kt and 161.09kt in 2030 and 2050 respectively, representing a 50% reduction in methane emissions from this sector. This ambitious goal aligns with the global effort to mitigate climate change and aligns with Nigeria's commitment under the Paris Agreement.</p>	<p>Multi-sectoral approach: The plan targets eight key sectors: transportation, cooking and lighting in households, industry, waste, oil and gas, agriculture, power and hydro-fluorocarbons</p> <p>22 specific mitigation measures: These measures address specific sources of SLCP emissions, such as promoting cleaner cookstoves, reducing agricultural burning and improving waste management.</p> <p>Phased implementation: The plan prioritizes actions with near-term benefits and gradually implements more complex measures.</p> <p>Monitoring and evaluation: A monitoring and evaluation framework tracks progress and identifies areas for improvement.</p>	<p>Policy and regulatory frameworks: Development and implementation of policies like the Gas Flaring Regulations contribute to SCLP reduction.</p> <p>Pilot projects and initiatives: Several pilot projects demonstrating cleaner technologies and practices are underway in various sectors.</p> <p>Capacity building and awareness raising: Training programs and public awareness campaigns are educating stakeholders about SLCPS and mitigation strategies.</p> <p>International collaboration: Nigeria collaborates with international partners on technology transfer, capacity building and financial support for SCLP mitigation.</p>
<p>Guidelines for Management of Fugitive Methane and Greenhouse Gases Emissions in the Upstream Oil and Gas Operations in Nigeria (NUPRC Guide 0024 - 2022)</p>	<p>NUPRC released guidelines (NUPRC Guide 0024 - 2022) to curb methane and other GHG emissions from oil and gas operations in Nigeria. These guidelines target reductions through:</p> <ul style="list-style-type: none"> Leak detection and repair (LDAR): Regular inspections to identify and fix leaks from equipment. Equipment maintenance: Proper upkeep of equipment to minimize leaks and emissions. Flaring reduction: Limits on the routine burning of natural gas, a major source of emissions. 	<p>LDAR:</p> <ul style="list-style-type: none"> Monitoring: Routine inspections using specified equipment (optical gas imaging cameras, etc.) to identify leaks from equipment like valves, flanges, connectors and compressors. Repair: Fixing leaks within designated timeframes based on severity (e.g. large leaks repaired within five working days, small leaks within 14). Recordkeeping: Maintaining records of inspections, repairs and replaced equipment along with technical specifications. <p>Equipment maintenance:</p> <ul style="list-style-type: none"> Upkeep programs: Developing and implementing preventative maintenance programs for equipment to minimize leaks and emissions. This could involve regular servicing, lubrication and replacement of worn parts. Training: Providing training to personnel on proper equipment operation and maintenance procedures to minimize emissions. <p>Flaring reduction:</p> <ul style="list-style-type: none"> Minimizing routine flaring: Reducing the practice of burning natural gas during oil production whenever possible. This might involve capturing and utilizing the gas for electricity generation or re-injection back into the reservoir. Flaring efficiency: Ensuring flares operate efficiently to minimize incomplete combustion and associated emissions. Reporting: Reporting flaring events and volumes to the regulatory body as stipulated in the guidelines. 	<p>The newly established guidelines for managing methane emissions in Nigeria's oil and gas sector (NUPRC Guide 0024 - 2022) are gaining traction. A series of workshops brought together over 167 stakeholders from government agencies (NMDPRA, Ministry of Petroleum Resources, NNPC), industry players and NGOs.</p> <p>These workshops achieved the following:</p> <ul style="list-style-type: none"> Raising awareness: The first workshop sensitized participants on implementing the guidelines. Equipping the industry: The final workshop focused on demonstrating LDAR techniques, a key strategy for reducing methane emissions. <p>This progress signifies a positive step towards achieving Nigeria's methane reduction targets and cleaner oil and gas operations.</p>

Source: Various; Author's analysis

Stakeholder mapping

The aim of the stakeholder mapping is to unpack how methane abatement is understood and acted upon in Nigeria from popular discourse by various stakeholders at various layers of the society. In addition, the mapping aims to identify and understand the roles, interests and influence of the key players involved in methane mitigation and reduction efforts. This involves:

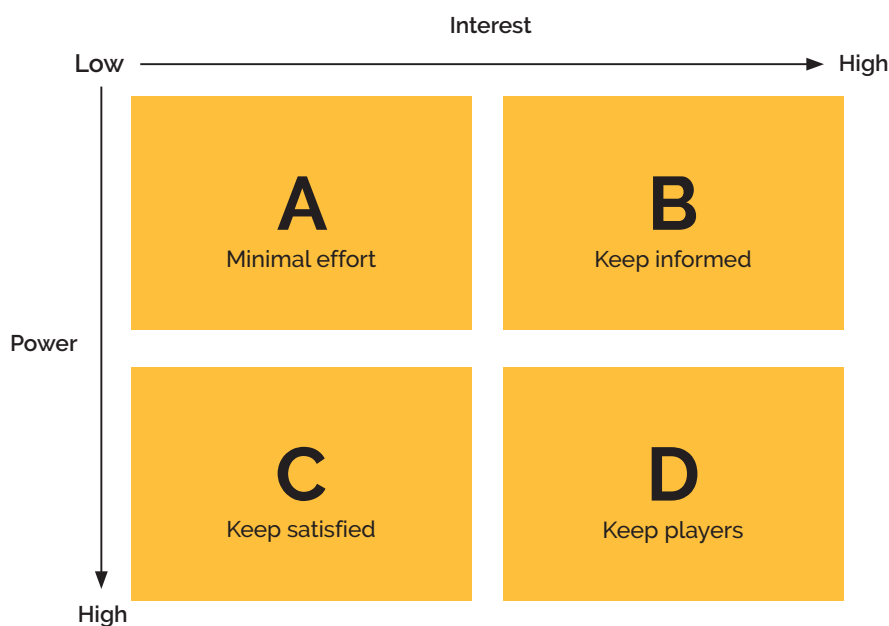
- State actors: Government agencies, regulators, policy- and decision-makers.
- Non-state actors: Oil and gas companies, operators, investors, NGOs, research institutions, civil society organizations and communities.
- Global entities: International organizations, donors and financial institutions.

Stakeholders are important to inform and support effective and sustainable actions around methane mitigation and reduction, for climate and broader societal transformation. The stakeholder mapping process blends the use of Mendelow's Matrix⁶³ and the Salience Model.⁶⁴

Mendelow's matrix

This model categorizes stakeholders based on their power (influence) and interest (stake) related to methane mitigation and reduction (see Figure 4). It provides a clear view of stakeholders' potential impact and helps prioritize engagement strategies:

Figure 4: Mendelow's Matrix



Source: Adapted from Mendelow, A. L. (1991). 'Environmental Scanning: The Impact of the Stakeholder Concept'. *Proceedings From the Second International Conference on Information Systems* 407-418. Cambridge, MA.

- High power/high interest: These stakeholders (e.g. NUPRC, major oil companies) have significant influence and are directly affected by policies and strategies for methane mitigation and reduction. It is imperative to engage them closely through collaborations, partnerships and regular consultation.
- High power/low interest: While influential, these stakeholders (e.g. some government agencies) may not be directly impacted. It will be important to inform them proactively, address their concerns and leverage their authority for broader support.
- Low power/high interest: These stakeholders (e.g. host communities, NGOs) are deeply affected but lack strong influence. It will be necessary to keep them informed and empower them through capacity building, active participation and addressing their concerns directly.
- Low power/low interest: These stakeholders (e.g. public) are minimally affected and have limited influence. It is best to monitor them and keep them informed through broad communication channels and respond to their inquiries.

The grid shown in Figure 4 is based on power and interest and allows us to identify which stakeholders are important. Those with high power and high interest would need to be managed closely, investing more time and resources. Keeping these stakeholders on side and informed will be a priority.

However, those stakeholders with low power and low interest (e.g. the local community or media) should be monitored and minimum effort expended in terms of time and money. The other two quadrants highlight stakeholders that need to be kept satisfied (high power, low interest) and those that need to be kept informed (high interest, low power).

Salience model

This model analyzes stakeholders based on their power, legitimacy and urgency regarding the project (see Figure 5).

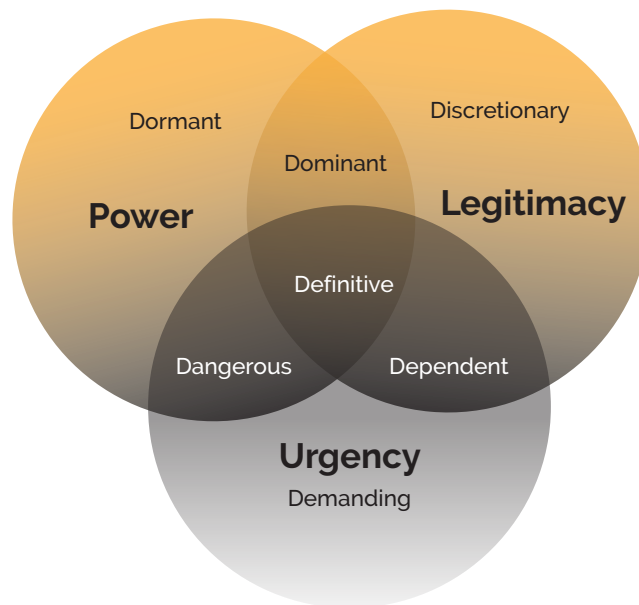
- Power: The ability of project stakeholders to influence the outcome of an organization, deliverable or project – the ability of a stakeholder to impose their will.
- Legitimacy: The authority and level of involvement project stakeholders have in a project and whether their involvement is appropriate and to what level.
- Urgency: The time expected by project stakeholders to respond to their expectations, especially those that require immediate action.

The Model helps identify key players and ensures all relevant perspectives are considered.

- High salience: These stakeholders (e.g. environmental regulators, affected communities) hold high power, legitimacy and urgency in methane mitigation. It is imperative to prioritize engagement, address their concerns directly and build strong partnerships.
- Medium salience: These stakeholders (e.g. industry associations, international organizations) have varying levels of power, legitimacy and urgency. We will tailor engagement based on their specific roles and interests.

- Low salience: These stakeholders (e.g. distant communities, public) may have lower power, legitimacy or urgency. Keep them informed indirectly through broader communication channels.

Figure 5: Salience's Venn diagram



Source: Adapted from Mitchell, R. K., Agle, B. R., & Wood, D. J. (1997). *Toward a Theory of Stakeholder Identification and Salience: Defining the Principle of Who and What Really Counts*. *The Academy of Management Review*, 22(4), 873.

Mapping the Salience Model to the grid-based model

Applying the four stakeholder management strategies used in the power/interest grid model (Figure 4) to the Salience Model (Figure 5) will necessitate the following actions:

- Definitive: Manage closely
- Dominant and Dangerous: Keep satisfied
- Dependent: Keep informed
- Dormant, Discretionary and Demanding: Monitor.

Stakeholder identification and analysis

Stakeholder analysis will be an ongoing process, which may evolve as new stakeholders are introduced to the project. A preliminary stakeholder analysis identifies the various interests of stakeholder groups and the influence these groups may have on methane mitigation and reduction in the oil and gas sector in Nigeria. The analysis will also shape the design of stakeholder consultation events and which stakeholders to engage and when.

Understanding who the key stakeholders are in Nigeria's oil and gas sector is essential for generating relevant and context-specific insights to inform and support effective and sustained methane reduction and mitigation in the sector. This section therefore provides an overview of government agencies, industry players, civil society organizations and international partners relevant in the methane mitigation and reduction efforts in Nigeria's oil and gas sector. The grouping of stakeholders involved provides a general overview of the methane mitigation and reduction landscape in the sector (Table 5).

Table 5: Landscape of broad methane mitigation and reduction multi-stakeholders in the oil and gas sector

Policy stakeholder, technical, commercial and environmental regulators	Oil and gas operators' production, processing, transmission/storage and distribution	Science and technology innovation (research and development (R&D))	Civil society organizations, host communities and the international community
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Source: Author's analysis

The preliminary mapping analysis of the oil and gas stakeholder landscape in Table 6 was developed using Mendelow's Matrix and the Salience Model. It was subject to further validation at the stakeholder workshop in March 2024.

Table 6: Preliminary analysis of the multi-stakeholders using the Mendelow and Salience mapping model

Stakeholders	Mendelow's mapping	Salience's mapping
Governments, commercial and environmental regulators and policymakers	High power/high interest	High salience
Oil and gas operators (production, processing, transmission/storage, distribution)	High power/high interest	High salience
Science and technology innovation (R&D)	Low power/high interest	Medium salience
Public international finance institutions	Low power/high interest	Medium salience
Private corporations and financial institutions	Low power/high interest	Medium salience
Civil society organizations, host communities and the international community	Low power/low interest	Low salience

Source: Author's analysis

Role of critical stakeholders in scaling methane reduction finance

Table 7: Examples of entry points for advancing methane reduction finance











Actions/ Priorities	Implemented regulations and fiscal policy tools	Promote R&D	Embed methane reduction in strategy	Deepen investment opportunities	Improve monitoring, reporting and verification (MRV) of methane emissions
Governments, commercial and environmental regulators and policymakers	Establish and enforce stringent methane emission limits by sector.	Prioritize R&D and innovation for grant financing or other government-provided finance for methane reduction.	Set methane reduction targets in NDCs. Incorporate methane reduction strategies in sectoral roadmap for net zero.	Use fiscal policy tools to encourage investment, including tax incentives/cuts for methane abatement projects.	Establish sector-specific guidelines and methodologies for the MRV of methane emissions. Mandate tracking and reporting of methane emissions.
Oil and gas operators (production, processing, transmission/storage, distribution)	Regularly identify and repair leaks from equipment through comprehensive LDAR programs.	Adopt and implement innovative technologies for methane capture, utilization and storage, aiming for continuous emissions reduction.	Implement operational best practices to minimize methane emissions throughout the value chain, such as using low-bleed pneumatic devices and reducing venting practices.	Collaborate with financial institutions to explore innovative financing models and attract investment in methane mitigation projects.	Enhance transparency by publicly reporting methane emissions and progress towards reduction targets.
Science and technology innovation (R&D)	Conduct R&D on advanced technologies for methane detection, monitoring, abatement and utilization.	Actively share research findings and collaborate with industry stakeholders to accelerate the development and deployment of effective methane reduction solutions.	Build research capacity in developing countries by supporting local research institutions and training researchers.	Collaborate with investors and financial institutions to establish robust evaluation frameworks for methane reduction technologies and projects.	Develop and disseminate standardized protocols and methodologies for accurate and reliable MRV of methane emissions.
Public international finance institutions	Provide technical assistance and project preparation support to developing countries where capacity is limited.	Promote international cooperation on R&D to enable knowledge transfer of best available technologies across different countries.	Prioritize methane abatement in lending strategies. Encourage and support the development of standardized methodologies for reporting methane abatement finance across projects.	Increase of concessional finance through blended finance structures or innovative financial instruments to attract more hard-to-invest-in sectors and regions.	Support the adoption of a common framework or endorse existing international standards like the Global Methane Assessment undertaken by CCAC and the United Nations Environment Programme. ⁶⁵

Actions/ Priorities	Implemented regulations and fiscal policy tools	Promote R&D	Embed methane reduction in strategy	Deepen investment opportunities	Improve monitoring, reporting and verification (MRV) of methane emissions
Private corporations and financial institutions	Work with industry association members to establish industry-wide best practices for intentional methane emission reduction projects within the context of abatement finance.	Directly invest in research and innovation for methane abatement technologies to gain a competitive advantage for methane reduction solutions.	Incorporate methane within net zero targets. Engage with net zero associations to encourage adoption of consistent reporting standards on methane abatement, in line with the Taskforce on Climate-related Financial Disclosures.	Implement best available methane abatement technologies and incorporate best practices within operating expenditure and capital expenditure that reduce methane.	Develop guidelines for methane emissions monitoring for project selection and reporting to ensure consistency and transparency. Measure methane emissions across the value chain.
Civil society organizations, host communities and the international community	Raise public awareness about the importance of methane reduction and the need for action.	Advocate for increased public and private funding for R&D activities focused on methane reduction. Engage with governments, research institutions and funding agencies to prioritize methane reduction in their research agendas.	Support the inclusion of ambitious methane reduction targets in national climate plans (NDCs) and advocate for the development of comprehensive national methane reduction strategies.	Facilitate dialogue and collaboration between investors, private companies and government agencies to explore and develop innovative financing mechanisms for methane reduction projects.	Advocate for transparency and accountability by demanding robust and accessible MRV systems for methane emissions. Support initiatives that empower communities to monitor and report on emissions from local oil and gas operations.












Source: Adapted from Fernandes, P., et al. (2023). *Landscape of methane abatement finance 2023. Climate Policy Initiative.*

Table 8 provides a list of relevant stakeholders identified, their roles and preliminary influence.

Table 8: MMRP stakeholders: Their high-level roles and influence

S/N	Organizations		High-level roles	Influence
Policy stakeholder, technical, commercial and environmental regulators				
1	National Council on Climate Change (NCCC)		The NCCC is the Nationally Designated Authority and official Focal Point working to address the impacts of climate change in Nigeria. Established in 2022, the NCCC is tasked with providing a platform for collaboration and coordination among various government agencies, the private sector, civil society organizations and other stakeholders in Nigeria to combat and mitigate the impact of climate change.	High
2	Federal Ministry of Environment		The Ministry carries out Environmental Impact Assessments (EIAs) for proposed major projects in line with the 2004 EIA Act.	High
3	Department of Climate Change (DCC)		The broad mandate of the DCC is to coordinate activities towards national implementation of the Climate Change Convention, its Kyoto Protocol and the Paris Agreement.	High
4	Federal Ministry of Petroleum Resources		The mandate of the Ministry is to formulate policies, supervise their implementation and regulate the Nigerian oil and gas (energy) industry.	High
5	Nigerian Upstream Petroleum Regulatory Commission (NUPRC)		NUPRC has the statutory responsibility of ensuring compliance with petroleum laws, regulations and guidelines in the upstream oil and gas sector.	High
6	National Oil Spill Detection and Response Agency (NOSDRA)		NOSDRA was established to coordinate the implementation of the National Oil Spill Contingency Plan (NOSCP), which also incorporates the National Oil Spill Contingency System (NOSCS) for Nigeria, in compliance with the International Convention on Oil Pollution Preparedness, Response and Cooperation (OPRC 1990), to which the country is a signatory. NOSDRA is the environmental regulator in the oil and gas sector of Nigeria. It enforces all environmental regulations in the oil and gas space.	High
7	Nigerian Midstream and Downstream Petroleum Regulatory Authority (NMDPRA)		NMDPRA is responsible for the regulation of the midstream and downstream petroleum operations in Nigeria, which includes technical, operational and commercial activities.	High
8	Federal Ministry of Finance Budget and National Planning (FMFBNP)		FMFBNP has the mandate to determine and advise the federal government on matters relating to national development and overall management of the national economy.	Low
9	Ministry of Finance Incorporated (MoFI)		The energy, oil and gas unit of the MoFI.	Low
10	Nigerian Gas Association (NGA)		The NGA is a non-political association that was formed in 1999 to promote the development of gas in Nigeria for the benefit of the nation and the various stakeholders.	High
11	NNPC Upstream Investment Management Services (NUIMS)		NUIMS is the investment management arm of the Nigerian National Petroleum Company (NNPC) Limited.	Medium

S/N	Organizations		High-level roles	Influence
Oil and gas operators production, processing, transmission				
12	Nigerian National Petroleum Company (NNPC) Limited		NNPC Limited is mandated to harness the possibilities of oil and gas, to address energy demand and drive the national economy. NNPC handles the whole chain, from exploration to sales, across oil, gas and even some renewables.	High
13	Nigeria LNG Limited (NLNG)		NLNG is a major player in the global liquefied natural gas (LNG) business. NLNG was incorporated as a limited liability company on 17 May 1989, to harness Nigeria's vast natural gas resources and produce LNG and natural gas liquids (NGLs) for export.	High
14	ExxonMobil		ExxonMobil is involved in the exploration and production of crude oil and natural gas; the manufacture of petroleum products; and the transportation and sale of crude oil, natural gas and petroleum products. ExxonMobil is a major manufacturer and marketer of commodities and specialty petrochemicals and has an interest in electric power generation facilities.	Medium
15	Chevron		In Nigeria, Chevron operates under a joint-venture arrangement with the Nigerian National Petroleum Corporation (NNPC) for the onshore and offshore assets in the Niger Delta region.	Medium
16	Shell Nigeria		Shell Nigeria, a major energy player in the country, operates through the Shell Petroleum Development Company (SPDC). They explore, produce and supply oil and gas, both domestically and for export. They also have a gas distribution company and invest in renewable energy solutions.	Medium
17	TotalEnergies		TotalEnergies is a global multi-energy company that produces and markets oil and biofuels, natural and green gas, renewables and electricity.	Medium
18	Seplat Energy		Seplat Energy has oil and gas assets in the prolific Niger Delta, close to export terminals and major demand centers. Seplat Energy has a significant record of accomplishment of maximizing value from upstream oil and gas assets. Seplat Energy had provided 30% of processed gas used for electricity in Nigeria, when new capacity came onstream in 2022.	Medium
19	Oando		Oando Plc is a Nigerian multinational energy company operating upstream, midstream and downstream.	Medium
20	Dangote Petroleum Refinery		Dangote Oil Refinery is a 650 000-bpd integrated refinery project under construction in the Lekki Free Zone near Lagos, Nigeria. It is expected to be Africa's biggest oil refinery and the world's biggest single-train facility.	Medium
21	Arдова Plc		Arдова Plc is an indigenous player in the downstream oil, gas and integrated energy sector. With a network of over 450 stations spread across the six geographical zones of Nigeria, the company specializes in the procurement and distribution of premium motor spirit (PMS), dual purpose kerosene (DPK), diesel (AGO) and liquefied natural gas (LNG).	Medium

S/N	Organizations		High-level roles	Influence
22	Bovas		Bovas operates across the entire oil and gas value chain, from exploration and production to marketing and distribution through an extensive network of filling stations and a robust haulage fleet.	Medium
23	Conoil Plc		Conoil Plc is a Nigerian petroleum marketing company involved in the sale of regulated gasoline and kerosene, diesel, aviation fuel and low-pour fuel.	Medium
24	MRS Oil Nigeria		MRS Oil Nigeria Plc is a fully integrated and efficient downstream player with leading positions in the Nigeria oil industry.	Medium
25	AA Rano Oil		AA Rano Oil is a full-stream oil and gas company in Nigeria dealing with the retail distribution of PMS, DPK, AGO, LPG and lubricants.	Medium
Research and development				
26	Nigerian Content Development Monitoring Board (NCDMB)		The board is responsible for the implementation of the Nigerian oil and gas sector Content Development Act.	High
27	Oxford Policy Management (OPM)		OPM is an international development consulting firm which aims to help low- and middle-income countries achieve growth and reduce poverty and disadvantage through public policy reform.	Medium
28	UK Foreign, Commonwealth and Development Office (FCDO)		The FCDO safeguards the UK's security, defends its values, reduces poverty and tackles global challenges with international partners.	Medium
Civil society organizations, host communities and the international community				
29	CSO: Centre for Environment, Human Rights and Development (CEHRD)		CEHRD was founded on 15 August 1999, as the Niger Delta Project for Environment, Human Rights and Development (NDPEHRD) and re-incorporated under its new name CEHRD in 2005 following its board decision.	Low
33	CSO: Oilwatch		Oilwatch's creation was inspired by the need to develop global strategies for the communities affected by oil activities, support their resistance processes, and work for sustainability and collective rights. They facilitate the exchange of information on oil activities in each country, the different resistance movements, and the international campaigns against specific companies.	Low
31	Civil Society Legislative Advocacy Centre (CISLAC)		CISLAC is a non-governmental, non-profit, advocacy, information-sharing, research and capacity-building organization. Its mission is to strengthen the link between civil society and the legislature through advocacy and capacity building for civil society groups and policymakers on legislative processes and governance issues.	Low
32	Corporate Accountability and Public Participation Africa (CAPPA)		CAPPA works to advance human rights, challenge corporate abuse of natural resources and build community power for inclusive development and participatory governance.	Low

S/N	Organizations	High-level roles	Influence
33	Environmental Rights Action (ERA) 	ERA is a Nigerian advocacy NGO founded on 11 January 1993 to deal with environmental human rights issues in Nigeria. ERA is the Nigerian chapter of FoEI.	Low
34	World Bank 	The World Bank is an international financial institution that provides loans and grants to the governments of low- and middle-income countries for the purpose of pursuing capital projects.	Low
35	United Nations Environment Programme (UNEP) 	UNEP is responsible for coordinating responses to environmental issues within the United Nations system.	Low
36	Clean Air Task Force (CATF) 	CATF is a non-traditional, fact-based, environmental organization driving change forward through policy and innovation.	Medium
37	International Energy Agency (IEA) 	The IEA works with countries around the world to shape energy policies for a secure and sustainable future.	Medium
38	Climate and Clean Air Coalition (CCAC) 	The CCAC is a voluntary global partnership of over 160 governments, intergovernmental organizations, business, scientific institutions and civil society groups committed to catalyzing concrete, substantial action to reducing SLCPs (including methane, black carbon and many hydrofluorocarbons).	High
39	United States Agency for International Development (USAID) 	USAID is an independent agency of the US government responsible for dispensing development assistance and civilian foreign aid.	Low

Note: The preliminary indication of their interest is based on Mendelow's Matrix (discussed earlier)

Methane mitigation and reduction financing

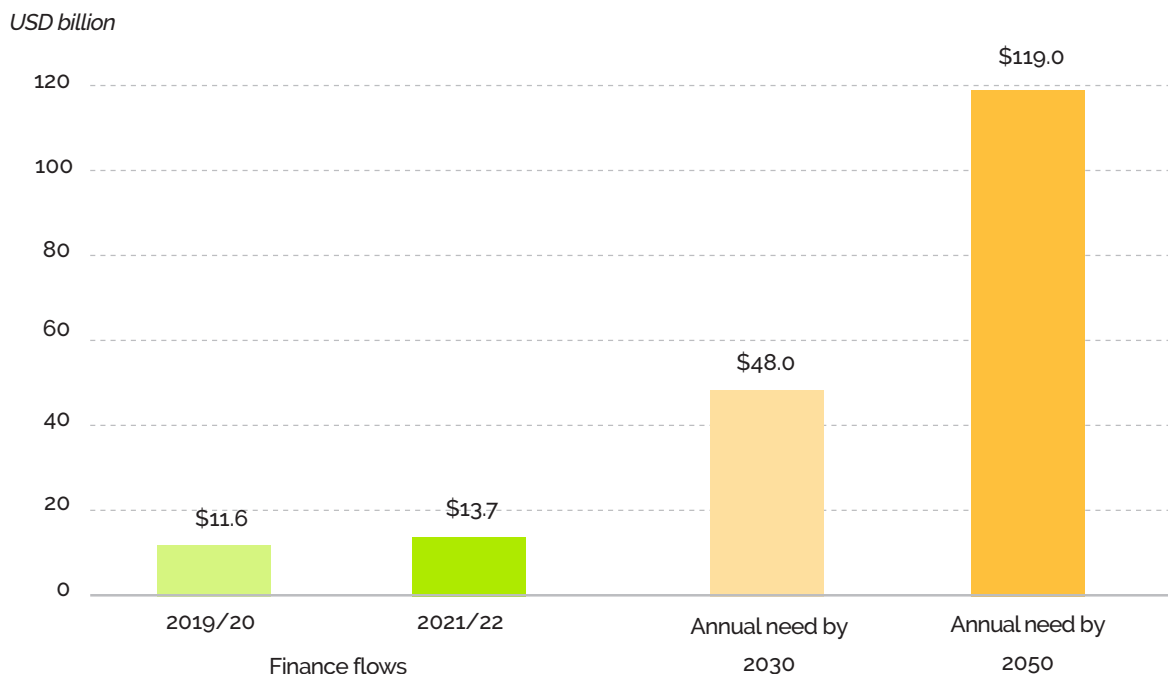
Sources of finance

While methane reduction offers one of the most effective climate investments, global funding lags far behind, falling short of the estimated annual need of US\$48 billion by 2030 (see Figure 6).⁶⁶

Funding has experienced a modest 18% increase since 2019/20 (rising from US\$11.6 billion to US\$13.7 billion in 2021/22), but the projected needs skyrocket between 2030 and 2050.⁶⁷ This underscores the urgency to accelerate financial support at an ever-increasing pace. The current methane mitigation finance flows are insufficient to meet global climate goals.

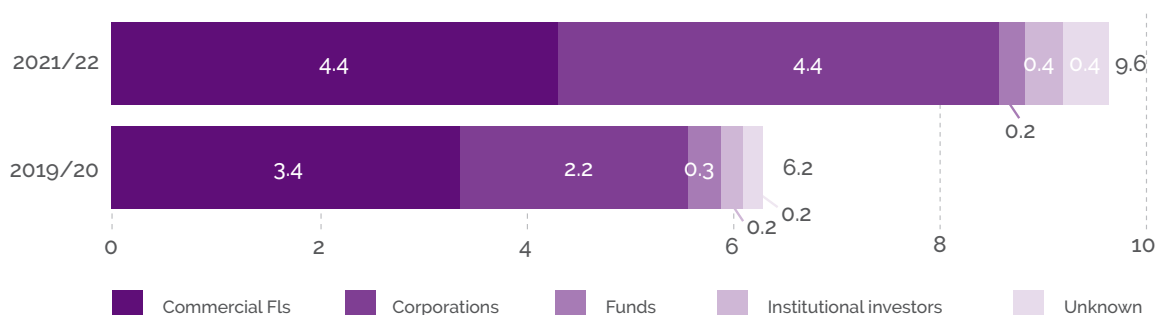
Private sources formed the largest portion of methane finance globally in 2021/22, amounting to US\$9.6 billion (Figure 7).⁶⁸ This marks a significant 55% increase on that tracked for 2019/20. Private finance drove the overall methane finance increase from 2019/20, mostly through commercial financial institutions (FIs; US\$4.4 billion) and corporations (US\$4.2 billion).⁶⁹ The key financial instrument for commercial FIs was project-level market rate debt, split between the Agriculture, Forestry and Other Land Use (AFOLU; US\$2.7 billion) and waste sectors (US\$1.6 billion).⁷⁰ The largest increase from 2019/20 to 2021/22 was driven by corporations, rising by over US\$2 billion. This came from the US in the form of balance sheet finance, going to AFOLU.

Figure 6: Global finance to methane abatement from 2019/20 and 2021/22 vs annual needs (2030 and 2050) (USD billion)



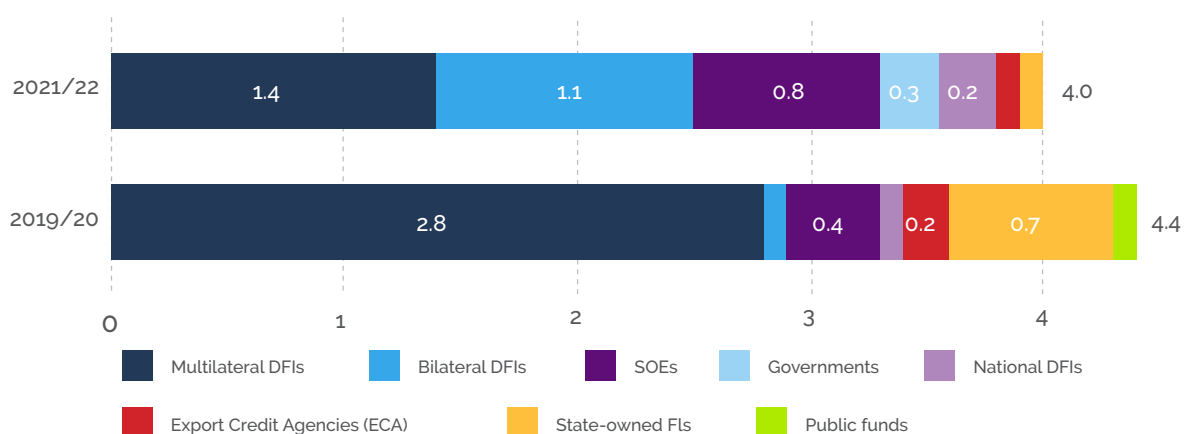
Source: Fernandes, P., et al. (2023). *Landscape of methane abatement finance 2023*. Climate Policy Initiative. <https://www.climatepolicyinitiative.org/wp-content/uploads/2023/11/Landscape-of-Methane-Abatement-Finance.pdf>

Figure 7: Private sources of methane abatement finance by actor type (USD billion, annual averages from 2019/20 and 2021/22)



Source: Fernandes, P., et al. (2023). *Landscape of methane abatement finance 2023*. Climate Policy Initiative. <https://www.climatepolicyinitiative.org/wp-content/uploads/2023/11/Landscape-of-Methane-Abatement-Finance.pdf>

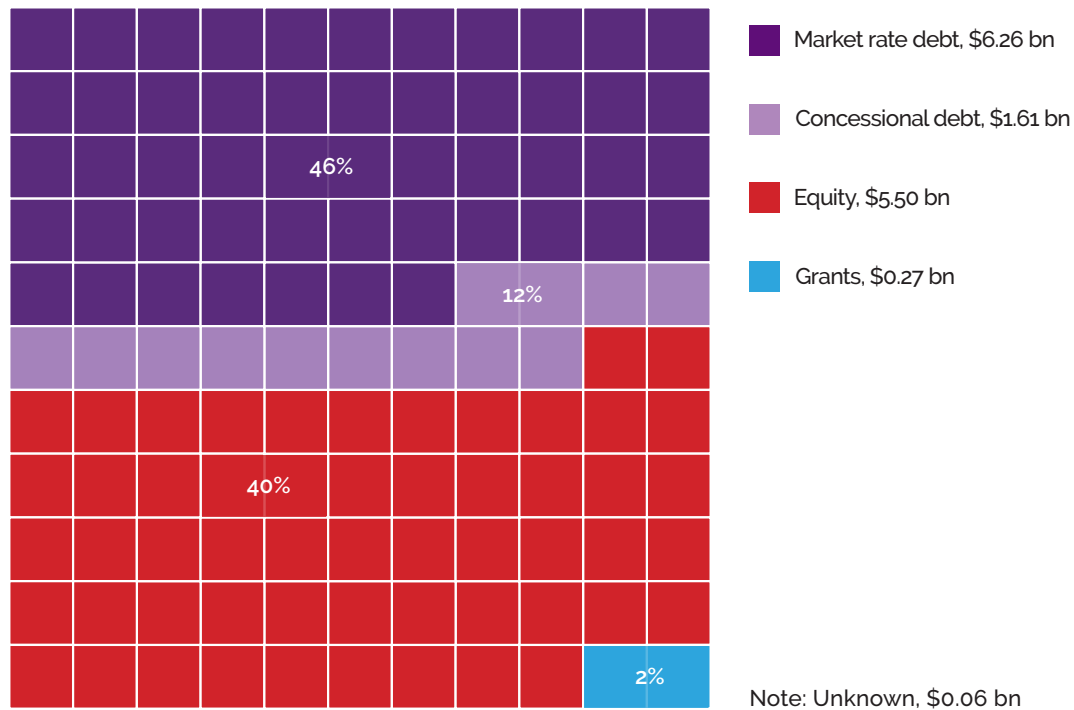
Figure 8: Public sources of methane abatement finance by actor type (USD billion, annual averages from 2019/20 and 2021/22)



Source: Fernandes, P., et al. (2023). *Landscape of methane abatement finance 2023*. Climate Policy Initiative. <https://www.climatepolicyinitiative.org/wp-content/uploads/2023/11/Landscape-of-Methane-Abatement-Finance.pdf>

For public sources, the largest sources globally in 2021/22 were multilateral and bilateral Development Financial Institutions (DFIs), contributing US\$1.4 billion and US\$1.1 billion, respectively (Figure 8).⁷¹ Multilateral DFI finance saw a 50% drop from 2019/20, driving the overall decline in public finance, much of which was due to China's reductions of US\$500 million for AFOLU and US\$1 billion for waste, according to CPI's 2023 report.⁷² China's higher flows in 2019/20 were driven by a one-time sustainable livestock project as well as funding for waste-to-energy plants. Most multilateral DFI finance was in the form of project-level debt, both as market-rate and low-cost debt.⁷³

Figure 9: Sources of methane reduction finance by instrument type (USD billion, 2021/22 annual average)



Source: Fernandes, P., et al. (2023). *Landscape of methane abatement finance 2023*. Climate Policy Initiative.

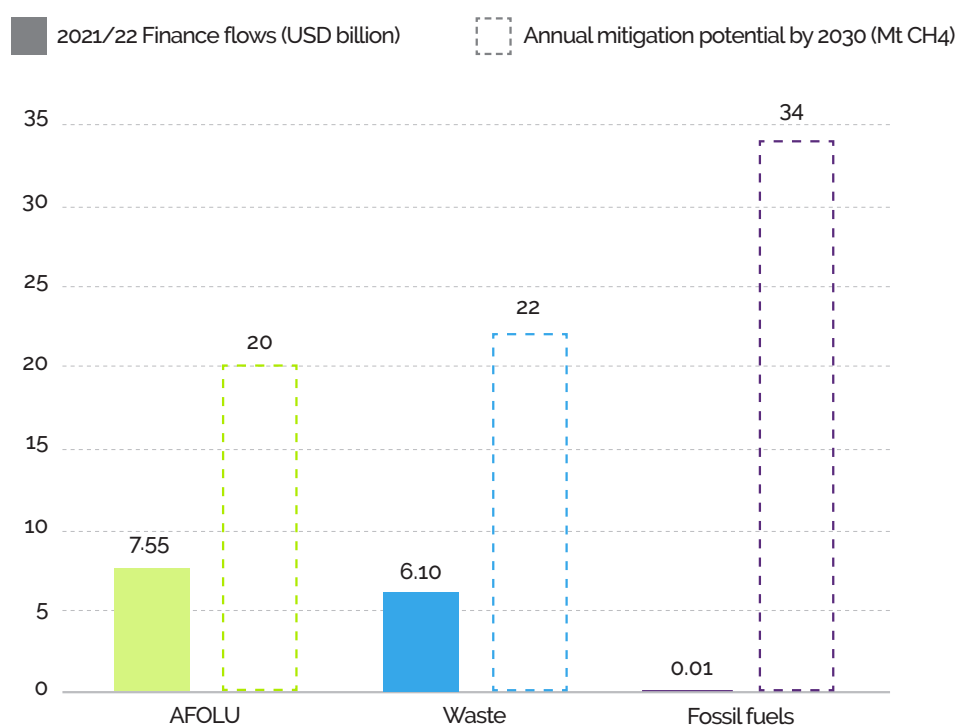
While debt and equity currently dominate methane reduction funding in the global space, with a combined 97% share, a potent opportunity lies in boosting public finance through grants and concessional loans (Figure 9).⁷⁴ While debt (57%) provides essential support, its lower risk appetite often leaves high-potential yet risky ventures unaddressed.⁷⁵

Grants and concessional loans, currently at a meager 2% combined, can act as catalysts, de-risking projects and paving the way for private investment. This aligns with the broader climate finance landscape, where grants constitute a larger 5% share. To reach this level in methane abatement, grants would need to triple, reaching roughly US\$0.7 billion.⁷⁶

Sectoral distribution of methane reduction finance

While the global majority of methane reduction funding currently flows to the waste and agriculture sectors, a critical gap exists in financing for the fossil fuel industry, despite its significant contribution to the problem. The largest recipient sector of methane reduction finance in 2021/2022 was AFOLU (with US\$7.5 billion), followed by waste (US\$6.1 billion) and fossil fuels (US\$10.6 million) (see Figure 10). Accounting for 37% of human-caused methane emissions,⁷⁷ the fossil fuel sector alone requires at least US\$11.2 billion in annual investment by 2030.⁷⁸

Figure 10: Sectoral distribution of methane abatement finance (USD billion, 2021/22 annual average) compared with annual mitigation potential (Mt CH₄/year)

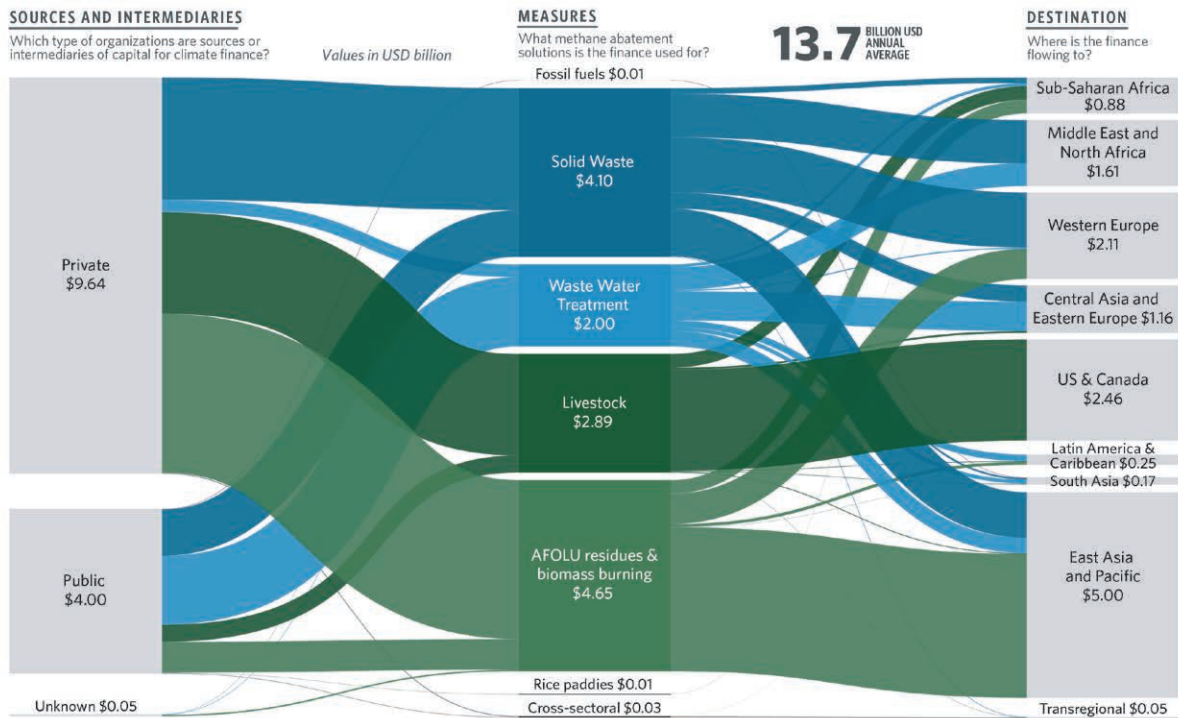


Source: Investment data tracked by CPI. Annual mitigation potential from DeFabrizio, S., et al. (2021, September 23). *Curbing methane emissions: How five industries can counter a major climate threat*. McKinsey & Company.

This funding gap, exceeding even the combined potential of agriculture and waste, is particularly concerning for the oil and gas subsector, though this subsector has the largest potential for mitigation.⁷⁹ Estimates by IEA, UNEP and CCAC⁸⁰ put the annual global need for this subsector at US\$9.4 billion, totaling US\$75 billion by 2030. This sum represents a mere 2% of the industry's net income for 2022, highlighting a stark disconnect between the scale of the problem and the current level of financial commitment.

According to a recent report by the IEA, over US\$75 billion in spending is required by 2030 to achieve the needed reductions in global methane emissions (Figure 12). In Nigeria, US\$1.5 billion will be needed between 2023 and 2030 to reduce methane emissions in the country's oil and gas operations (Figure 13).⁸¹ According to the report, oil and gas majors operating in the country have a responsibility to contribute US\$300 million to meet the target. Also, the NNPC Limited and other investors in Nigeria's oil and gas sector have the capacity to contribute US\$700 million and US\$500 million respectively during the same period.⁸²

Figure 11: Climate financing landscape for methane



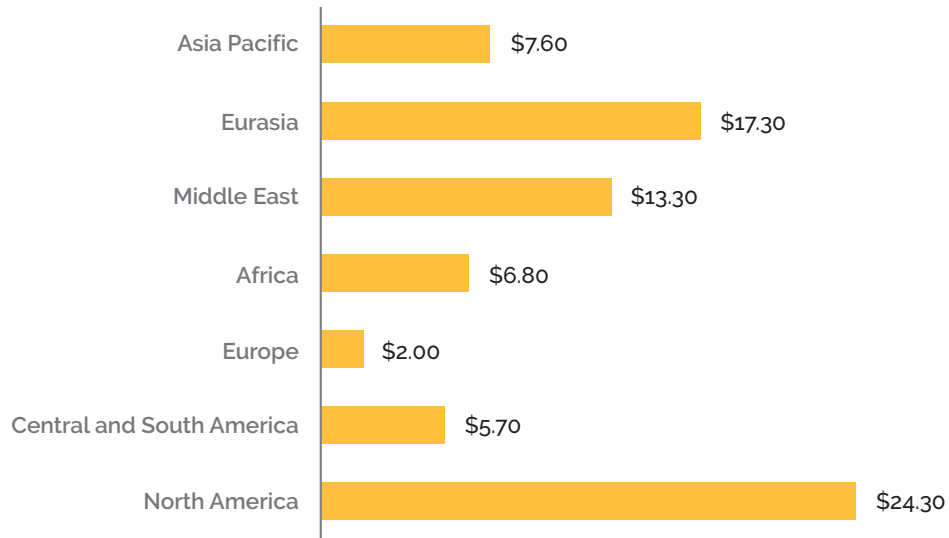
Source: Fernandes, P., et al. (2023). Landscape of methane abatement finance 2023. Climate Policy Initiative.

Investment barriers in fossil fuel arise due to information gaps about methane sources and emissions levels and impacts. Inadequate infrastructure to bring captured gas to the consumer for productive use, along with a lack of understanding of the cost-effectiveness of reduction and the lack of a regulatory framework also present as significant obstacles to investment.⁸³

However, emerging corporate action is expected to play a crucial role in bridging the investment gap. For example, the Aiming Zero Methane Emissions Initiative, launched by the Oil and Gas Climate Initiative (OGCI) in 2022, comprises 90 oil and gas company signatories who aim to reduce their methane emissions to "near zero" by 2030.⁸⁴

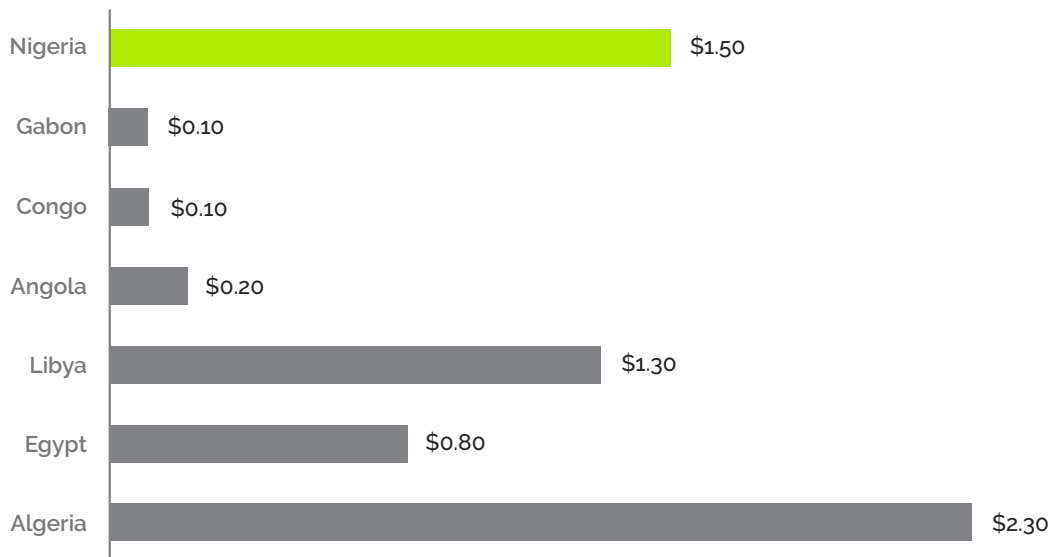
To accelerate progress, governments can set more stringent regulations and standards, mandate project planning requirements, directly invest in new infrastructure, put a price on environmental externalities, offer financial incentives for methane capture and abatement technologies, and eliminate investment barriers.⁸⁵

Figure 12: Emissions spending needs by 2030 per region (USD billion)



Source: IEA data; Author's analysis

Figure 13: Emissions spending need by 2030 in Africa (USD billion)



Source: IEA data; Author's analysis

Insights from national stakeholder validation workshop

APRI – Africa Policy Research Institute, in close collaboration with the Department of Climate Change, Federal Ministry of Environment, Nigeria, organized a stakeholder engagement event in the context of the project on methane mitigation and reduction in Nigeria's oil and gas sector.

The workshop introduced the project to relevant stakeholders and gathered feedback on the initial findings from the mapping exercise conducted by APRI, which maps out the methane landscape, including mitigation and reduction policies, implementation strategies, the state of financing, and stakeholders involved in these efforts. After initial inputs and a presentation of the summary of the key findings, the participants discussed and assessed the status, gaps, challenges and opportunities for effective and sustained methane mitigation and reduction efforts and identified areas where more data and information are needed to inform and support methane action policy and implementation strategies, specifically in the oil and gas sector.

An insightful policy pronouncement was made at the event by the Federal Ministry of Environment:

Within the oil and gas sector, practical steps are being taken to address methane emissions. Collaborative efforts of government institutions have led to the development of methane guidelines. In addition, the Federal Ministry of Environment through the National Oil Spill Detection and Response Agency (NOSDRA) will be commencing the periodic quarterly review of the plans of international and indigenous oil companies to ensure they stay on course to end routine gas flaring by latest 2030. – Dr Iziaq Adekunle Salako

Acting upon this policy pronouncement, NOSDRA recently convened the inaugural meeting on quarterly reporting of utilization efforts and initiatives towards the reduction of carbon footprints in Nigeria. The goal is to end gas flaring, mitigating methane emissions to “near zero” by 2030.⁸⁶ The cooperation of all stakeholders in the oil and gas industry within the upstream sector was sought as a crucial step in enhancing accountability and revenue generation within the sector. Other efforts by NOSDRA have led to the development of a mechanism for fact-checking gas flared volumes.



Participants at the national stakeholder engagement workshop, in Abuja, Nigeria, 2024

Analysis and discussion

This section draws on the key insights from previous sections and the stakeholder validation workshop held in Abuja, Nigeria, on 26 March 2024. This workshop discussed the intricate interplay between policies, regulations, strategies, finances and stakeholders within Nigeria's oil and gas sector. Through a comprehensive analysis, this mapping report unlocks the critical pathways for achieving the project's objective by addressing the following questions: What do these intricate pieces tell us about the current state of methane mitigation efforts in Nigeria? What are the roadblocks hindering progress, and what are the emerging opportunities? And how can methane migration and reduction be aligned with Nigeria's national priorities and the global imperative for climate action and SDGs to maximize potential benefits?

Key insights from the emission context in Nigeria's oil and gas sector

- Given the high emission of about 209 million tonnes of carbon dioxide equivalent from the sector, transitioning towards cleaner energy sources and reducing emissions from the oil and gas sector is imperative. Coupled with energy efficiency measures, strategic investments in integrated science, technology and renewable energy infrastructure such as solar and wind power, as well as those of the blue economy, can help diversify the energy mix and mitigate emissions from the oil and gas sector.⁸⁷
- Likewise, as human-caused methane emissions continue to increase, there are more reasons than ever to reduce methane emissions within this decade. The CCAC and UNEP's Global Methane Assessment suggests that there are technologies and policy frameworks that are both cost-effective and beneficial to society.⁸⁸
- Integrating methane mitigation efforts into other key sectors of the economy such as agriculture and land use is crucial. Sustainable agricultural practices, including agroforestry and soil conservation techniques, can enhance carbon sequestration and resilience to climate impacts. Additionally, addressing deforestation and promoting afforestation initiatives can contribute to carbon mitigation and biodiversity conservation.

Assessment of local policy coherence (or incoherence) with country needs

On paper, existing Nigerian policies are coherent with international commitments for methane mitigation and reduction (Table 9). The strategic effort of NOSDRA in developing a nationally acceptable transformational data tool (i.e. the Satellite-based Methane Emission Tracker, or SMET) is aimed at detecting, measuring and quantifying methane emissions for regulatory action.⁸⁹ The NUPRC Guidelines for Management of Fugitive Methane and Greenhouse Gases Emissions in the

Upstream Oil and Gas Operations in Nigeria (NUPRC Guide 0024 - 2022) are aligned with the Global Methane Pledge.⁹⁰ The 2050 Long-Term Vision for Nigeria (LTV-2050)⁹¹ and the Energy Transition Plan (ETP)⁹² also emphasize the importance of methane mitigation and achieving net zero emissions. The National Action Plan is aimed at achieving 60% reduction in methane and other SLCP emissions by 2030. The NDC update sets a goal of reducing emissions by 60% from 2010 levels by 2030. Notably, both initiatives are consistent with the commitment made to the Global Methane Alliance, which targets a reduction of 60–70% in methane emissions by 2030.

Table 9: Assessment of national policies with international commitments and pledges

National policies/action plans	Alignment with international commitments and pledges					
	UNFCCC	OGMP	CCAC	GMI	GMA	GGFR
Nationally Determined Contributions (NDCs)	✓	✓	✓	✓	✓	✓
Nigeria's 2050 Long-Term Vision (LTV-2050)	✓			✓		
Nigeria's Climate Change Policy (NCCP)	✓		✓	✓		✓
Nigeria's National Action Plan for Short-Lived Climate Pollutants (SLCPs)	✓	✓	✓		✓	✓
Nigeria's Energy Transition Plan (ETP)	✓		✓			✓
National Oil Spill Contingency Plan (NOSCP)	✓					✓
Guidelines for Management of Fugitive Methane and Greenhouse Gases Emissions in the Upstream Oil and Gas Operations in Nigeria (NUPRC Guide 0024 - 2022)	✓			✓		✓

Notes: Alignment of policies was derived from national policy documents with specific sections and content that emphasized the need and target to address methane emissions generally or from specific sectors. The SLCP is an important document for this analysis viz-à-viz UNFCCC's mission and other global initiatives.

✓ indicates an alignment between national policies/action plans and international commitments and pledges.

Key insights from policy framework

- There is a need for coherent and ambitious methane action plans that align with Nigeria's national development priorities. Tactically implementing policies and regulations that incentivize low-carbon investments, promote sustainable land use practices and foster innovation in clean technologies can accelerate progress towards climate mitigation goals.
- Our preliminary finding reveals that earlier legislations do not have specific references to methane mitigation or reduction beyond the broad commitment to eliminating gas flaring by 2030, which is embedded in a number of these documents.

Key insights from stakeholder mapping and engagement

- Enhancing public awareness and public participation through stakeholder mapping and engagement to achieve climate mitigation goals is essential for fostering the culture of sustainability and collective action needed to achieve the MMRP of the oil and gas sector in Nigeria. Education and outreach campaigns concerning the risks posed by current exploration and production activities and the need to adopt climate-friendly behaviors, such as energy conservation, waste reduction and sustainable transportation choices can be promoted to holistically address climate mitigation considering Nigeria's socio-economic structure, sectoral priorities and development objectives.
- Drawing from previous experiences and lessons learnt, effectively implementing a definite action plan in Nigeria requires robust coordination among various stakeholders, including government agencies, the private sector, civil society organizations and research institutions.

Key insights from the stakeholder validation workshop

- Data tracking and reporting: A representative from NOSDRA emphasized the value of satellite technology for emissions tracking. This further stressed the importance of establishing an independent data source to ensure the robustness of emissions reporting. This highlights the need for a comprehensive approach to data collection and verification.
- Policy development: A representative from the Nigerian Nuclear Regulatory Authority (NNRA) advocated for a more analytical approach to policy design, incorporating tools like SWOT (Strengths, Weaknesses, Opportunities, Threats) and PEST (Political, Economic, Social, Technological) analyses. This suggests a data-driven and comprehensive approach to policy development for effective methane mitigation.
- Midstream and downstream considerations: A representative from the NMDPRA highlighted the ongoing efforts to develop guidelines for tracking and mitigating emissions in the midstream and downstream sectors of the oil and gas sector. They further emphasized the need for innovative technologies, capacity building across relevant agencies and increased public awareness. This highlights the importance of a comprehensive approach that addresses all segments of the oil and gas value chain.
- Leveraging existing initiatives: A representative from the Federal Ministry of Petroleum Resources suggested exploring the possibility of adapting SMET to better reflect current climate realities. They also emphasized the value of leveraging NOSDRA's initiatives such as the full operationalization and utilization of the Nigerian Gas Flare Tracker, the forthcoming SMET and the sector-based MRV system. Additionally, they noted the Ministry's collaboration with the NCCC to advance methane emission mitigation efforts. This underscores the importance of collaboration and utilizing existing resources for maximum impact.
- Data disaggregation and utilization: A representative from the Federal Ministry of Agriculture and Food Security stressed the need to disaggregate data and translate it into actionable insights. This suggests a focus on ensuring data is presented in a way that is readily usable by policymakers and stakeholders.

- **Community protection:** A representative from the Nigeria Union of Petroleum and Natural Gas Workers (NUPENG) advocated for the report to include practical solutions on how host communities can protect their environment from the impacts of methane emissions. This highlights the importance of incorporating the perspectives and needs of local communities into methane mitigation strategies.
- **Subnational engagement:** A representative from the Nigeria Governors' Forum proposed an inclusive and robust engagement to include relevant agencies and stakeholders at the subnational level, particularly in oil-producing regions in the methane mitigation effort. This suggests the importance of a multi-level governance approach that incorporates the critical role of subnational actors in achieving national methane reduction targets.

Key insights from the finances landscape

- According to a recent report by the IEA, Nigeria needs US\$1.5 billion between 2023 and 2030 to reduce methane emissions in the country's oil and gas operations.⁹³ As a result, the funding gap must be urgently bridged, and investments scaled up to mitigate methane emissions and unlock the full potential of this critical climate solution.
- Policymakers hold the key to unlocking this vital capital on the global stage. Directing new grant and concessional resources towards the highest mitigation potential opportunities, particularly in challenging technological areas and geographical regions, can significantly impact the fight against methane emissions. However, sustained support for public finance is needed to spur long-term confidence and unlock private investments from these hard-to-tap areas.

Observed challenges

Nigeria encounters multifaceted obstacles in mitigating methane emissions within its oil and gas sector.⁹⁴ They are mapped out as follows:

- The establishment and enforcement of stringent regulatory frameworks is daunting, necessitating greater coordination between NUPRC and NMDPRA. The better these two organizations are coordinated, the more holistic and effective methane mitigation will be across the industry segments.
- The complexity of stakeholder engagement exacerbates the issue. Divergent interests and priorities among government agencies, oil companies, local communities and environmental organizations complicate collaborative efforts.
- Technological limitations and infrastructure gaps constrain the adoption of advanced methane capture and reduction technologies, further impeding progress in emission reduction initiatives.
- Addressing these challenges requires a concerted effort to overcome regulatory, financial, stakeholder and technological barriers, and advance Nigeria's goals of environmental sustainability and energy efficiency within its oil and gas sector.
- The low interest in researching methane emissions by Nigerian academics and researchers creates a knowledge gap. Supporting research efforts in this area can lead to the development of more effective mitigation strategies tailored to the Nigerian context.

Opportunities

The Global Methane Pledge, which aims to reduce methane emissions by at least 30% below 2020 levels by 2030, was announced at COP26 in 2021. By November 2023, it had received commitments from 151 countries, accounting for over 50% of global anthropogenic methane emissions. Since the pledge, there has been a notable uptick in national and international policies and measures to mitigate methane emissions (Table 10).

Table 10: Emerging international initiatives

Initiatives	
Global Methane Pledge Energy Pathway	The Global Methane Pledge Energy Pathway is a multi-country effort launched in June 2022 (by the US, EU, Argentina, Canada, Denmark, Egypt, Germany, Italy, Japan, Mexico, Nigeria, Norway and Oman) to reduce methane emissions in oil and gas. The goal is to inspire all nations to maximize cost-effective methane mitigation in the sector, striving to eliminate routine flaring at the earliest opportunity and no later than 2030. ⁹⁵
COP28	Several businesses promised to cut their methane output. Under the Oil and Gas Decarbonization Charter, 50 companies accounting for 40% of global oil production committed to eliminating their methane emissions by 2050. They also committed to ending flaring by 2030. To facilitate this, the World Bank announced the creation of a US\$250 million trust fund to help companies avoid flaring. However, major oil and gas companies like Chevron and ExxonMobil have so far declined to contribute. ⁹⁶ The United Arab Emirates, with a contribution of US\$100 million, was among the backers of a new World Bank methane trust fund, which is meant to help reduce flaring and emissions of GHG. A dozen philanthropies said they would invest US\$450 million over the next three years to help countries launch national actions to tackle methane.
Methane Finance Sprint	The Methane Finance Sprint, which aimed to mobilize US\$200 million by COP28 to support methane reduction activities in developing countries. ⁹⁷
Global Methane Pledge	Following the signing of the Global Methane Pledge, in November 2022 the US, EU, Japan, Canada, Norway, Singapore and the UK jointly declared their commitment to reduce methane emissions across the fossil energy value chain. This includes adopting measures and policies for rapid emissions reduction, establishing robust monitoring, reporting and verification systems, offering financial and technical assistance, and incentivizing reductions in imported fossil fuels. ⁹⁸
Global Flaring and Methane Reduction Partnership	At COP27, the US and EU extended the World Bank's Global Gas Flaring Reduction Partnership to cover methane emissions reductions, creating the Global Flaring and Methane Reduction Partnership. ⁹⁹

Implementing methane mitigation measures within Nigeria's oil and gas sector presents a myriad of opportunities with far-reaching benefits:¹⁰⁰

- Firstly, there are substantial economic advantages to be gained, as the adoption of methane mitigation and reduction measures can lead to cost savings for oil and gas companies.
- Through the recovery and sale of captured methane, as well as the potential revenue from carbon credits, these measures can bolster financial sustainability and competitiveness within the industry.
- Prioritizing methane reduction and mitigation contributes significantly to environmental sustainability, aligning with Nigeria's commitments to global climate change mitigation efforts.

- Effective methane mitigation directly translates into improved air quality in areas surrounding oil and gas operations, leading to reduced respiratory illnesses and healthcare costs for communities. This fosters a healthier and more resilient society.
- Investing in R&D of methane mitigation technologies will propel the growth of the clean energy sector, fostering technological innovation and creating new job opportunities in a sustainable industry.
- By demonstrating a strong commitment to methane reduction, Nigeria can elevate its international reputation and attractiveness for foreign investment in the oil and gas sector, fostering greater trust and collaboration on the global stage.
- The pioneering nature of Nigeria's methane regulations in the African oil and gas sector presents a valuable opportunity. This leadership role can facilitate the exchange of best practices and lessons learned with other oil-producing countries, both established and emerging. By fostering peer-to-peer knowledge sharing, Nigeria can contribute to a collective effort towards implementing effective methane mitigation and reduction measures across the continent. This, in turn, will empower new oil producers to adopt cleaner practices from the outset, accelerating progress towards a more sustainable oil and gas sector in Africa.

Potential pathways forward

To chart a successful course forward in mitigating methane emissions within Nigeria's oil and gas sector, several strategic pathways must be pursued.

- Nigeria should prioritize policy coordination among relevant government agencies, fostering collaboration to develop cohesive policies and regulations tailored to methane mitigation.
- Exploring innovative financial mechanisms by establishing a firm climate financing basis with the Federal Ministry of Finance and the Central Bank of Nigeria through public-private partnerships and green bonds can unlock much-needed investment for methane reduction projects, ensuring financial sustainability and scalability.
- Investing in capacity building and technology transfer initiatives is imperative to facilitate the adoption of methane reduction technologies and practices among local stakeholders, and to promote widespread implementation and impact.
- Fostering inclusive stakeholder engagement processes that involve local communities, industry players and environmental groups is essential to garner broader buy-in and support for methane mitigation initiatives, fostering a sense of ownership and commitment.
- Establishing robust monitoring and reporting mechanisms is paramount for tracking progress, verifying emissions reductions and ensuring accountability, underpinning the effectiveness and credibility of methane mitigation efforts.
- By pursuing these pathways with diligence and determination, Nigeria can effectively address methane emissions in its oil and gas sector, advancing its SDGs, enhancing environmental stewardship and fortifying economic resilience in the long term.

Conclusion

This methane mitigation and reduction project (MMRP) mapped critical stakeholders, the financing landscape and relevant policies in Nigeria's oil and gas sector. This comprehensive mapping provides a foundation for enhanced, effective and sustainable methane reduction efforts. By understanding key players' roles and interests, informing policy development and identifying suitable financing strategies, the MMRP equips stakeholders to navigate the complexities of methane reduction and pave the way for a cleaner future.

For the methodology, the report used a mixed-method research approach tailored to the Nigerian context. This approach combined various methods and tools, including a systematic literature review, early stakeholder consultations, data documentation and analysis, and a national stakeholder validation workshop. The workshop introduced the project to relevant stakeholders and gathered feedback on the initial findings from the mapping exercise. This comprehensive strategy ensured the report's findings and procedures are compatible with Nigeria's realities and provide a robust foundation for future action.

The current needs and priorities to address climate change in Nigeria are framed within the context of sustainable development, poverty reduction and environmental conservation. This mapping exercise recognizes the interconnectedness between climate action and broader development goals, such as improving livelihoods, enhancing food security, promoting public health, broader societal transformation and well-being – including job creation and fostering inclusive growth through the lens of the oil and gas sector MMRP. Therefore, efforts to address climate change in Nigeria can succeed through an integrated approach that considers the social, economic and environmental dimensions of societal complexities.

Overall, this mapping has demonstrated that understanding the methane landscape and its associated stakeholders has the potential to significantly reduce methane emissions in Nigeria's oil and gas sector, contributing to broader climate change mitigation efforts, attaining SDGs and improving overall well-being for the nation. By strategically harnessing the identified potential in renewable energy, land use practices, policy development, public engagement and international finance, the project is well positioned to pave the way for a cleaner future for Nigeria's energy sector.

Key take-aways

Emissions context

- High methane emissions from the sector necessitate a transition to cleaner energy sources (solar, wind, blue economy) and reduced emissions from oil and gas production.
- Urgent action is needed to address rising methane emissions. Existing technologies and policies offer cost-effective solutions with immediate benefits.

Policy framework and coherence

- Ambitious and coherent methane action plans aligned with national development goals are essential.
- Policies should incentivize low-carbon investments, promote sustainable land use, and foster clean technology innovation to accelerate climate mitigation.
- Existing legislation lacks specific references to methane mitigation beyond gas flaring reduction targets.
- On paper, existing Nigerian policies demonstrate some coherence with international commitments and national objectives for methane reduction. However, interoperability and seamless implementation is required among relevant organizations and regulatory stakeholders.

Stakeholder mapping and engagement

- Public awareness and participation are critical for achieving climate mitigation goals.
- Education and outreach campaigns promoting climate-friendly behaviors (energy conservation, waste reduction, sustainable transport) are crucial.
- Effective implementation requires robust coordination among government, private sector, civil society and research institutions.

Financial landscape

- An estimated US\$1.5 billion is needed between 2023–2030 to reduce methane emissions in Nigeria's oil and gas sector.
- Bridging the funding gap and scaling up investments are crucial to unlock the potential of methane mitigation as a climate solution.
- Policymakers play a key role in attracting investment by directing resources towards high-impact opportunities and challenging areas.
- Sustained public finance support is needed to provide long-term confidence and unlock private investment in these critical areas.

Stakeholder validation workshop

- Data-driven approach: Utilize satellite technology and establish independent data sources for robust emissions tracking and reporting.
- Policy development: Employ analytical tools like SWOT and PEST analyses to design data-driven and holistic methane mitigation policies.
- Comprehensive strategy: Address all segments of the oil and gas value chain, including midstream and downstream considerations, with a focus on innovative technologies, capacity building and public awareness.
- Collaboration and resource utilization: Leverage existing initiatives like SMET and NOSDRA programs and collaborate with bodies like the National Council on Climate Change to maximize impact.
- Actionable data: Disaggregate data and translate it into actionable insights for policymakers and stakeholders.
- Community protection: Integrate practical solutions for protecting host communities from methane emissions into mitigation strategies.
- Multi-level governance: Ensure inclusive engagement with relevant subnational agencies and stakeholders in oil-producing regions.

Endnotes

- 1 Department of Climate Change Federal Ministry of Environment. (2018, December). *Nigeria's National Action Plan (NAP) to reduce Short-Lived Climate Pollutants (SLCPs)*. <https://climatechange.gov.ng/wp-content/uploads/2020/09/nigeria-s-national-action-plan-nap-to-reduce-short-lived-climate-pollutants-slcp-s-.pdf>
 - 2 Ibid.
 - 3 Worldometer. (2023, July). *Countries in the world by population (2024)*. <https://www.worldometers.info/world-population/population-by-country/>
 - 4 World Bank. (2024). *World Bank national accounts data*. <https://data.worldbank.org/indicator/NY.GDP.MKTP.KD?locations=NG-EG>
 - 5 National Bureau of Statistics. (2023). *Foreign trade in goods statistics*. <https://nigerianstat.gov.ng/elibrary/read/1241419>
 - 6 Central Bank of Nigeria. (2022, July 31). *Annual statistical bulletin*. <https://www.cbn.gov.ng/documents/Statbulletin.asp>
 - 7 National Bureau of Statistics. (2023). *Nigerian Gross Domestic Product report (Q3 2023)*. <https://nigerianstat.gov.ng/elibrary/read/1241415#>
 - 8 Climate Watch. (2024). *Nigeria*. https://www.climatewatchdata.org/countries/NGA?end_year=2020&start_year=1990
 - 9 Ibid.
 - 10 Department of Climate Change Federal Ministry of Environment. (2018, December). *Nigeria's National Action Plan (NAP) to reduce Short-Lived Climate Pollutants (SLCPs)*. <https://climatechange.gov.ng/wp-content/uploads/2020/09/nigeria-s-national-action-plan-nap-to-reduce-short-lived-climate-pollutants-slcp-s-.pdf>
 - 11 Ibid.
 - 12 CCAC Secretariat. (2023, September 26). *Nigeria begins implementation of oil and gas methane reduction*. Climate and Clean Air Coalition. <https://www.ccacoalition.org/news/nigeria-begins-implementation-oil-and-gas-methane-reduction>
 - 13 Nigerian Upstream Petroleum Regulatory Commission (NUPRC). (2022, November 10). *NUPRC Guidelines for Management of Fugitive Methane and Greenhouse Gases Emissions in the Upstream Oil and Gas Operations in Nigeria*. <https://www.nuprc.gov.ng/wp-content/uploads/2022/11/METHANE-GUIDELINES-FINAL-NOVEMBER-10-2022.pdf>
 - 14 CCAC Secretariat. (2024). *Global Methane Pledge*. <https://www.globalmethanepledge.org/>
 - 15 Policy and Legal Advocacy Centre (PLAC). (2024). *The complete 2004 laws of Nigeria*. <https://placng.org/lawsfnigeria/view2.php?sn=40>
 - 16 *Hydrocarbon Oil Refineries Act*. (1965, June 11). <https://www.placng.org/lawsfnigeria/laws/H5.pdf>
 - 17 *Motor Spirit Returns Act*. (n.d.). PLAC. <http://lawsfnigeria.placng.org/view2.php?sn=259>
 - 18 *Nigerian National Petroleum Corporation Act 1977*. (1977, April 1). Neiti. <https://neiti.gov.ng/cms/wp-content/uploads/2022/08/NNPC-Act-1977.pdf>
 - 19 National Bureau of Statistics. (2022, May). *Nigerian gross domestic product report (Q1 2022)*. <https://nigerianstat.gov.ng/elibrary/read/1241175>
 - 20 International Trade Administration. (2023, June 6). *Nigeria – country commercial guide*. <https://www.trade.gov/country-commercial-guides/nigeria-oil-gas-and-mining-sectors>
-

- 21 Anaro, B., & Ifeakandu, A. (2022, July 4). Nigeria lost US\$1bn revenue to crude oil theft in Q1 2022. *Blueprint*. <https://blueprint.ng/nigeria-lost-1bn-revenue-to-crude-oil-theft-in-q1-2022/>
- 22 Eboh, C. (2022, July 2). Nigeria lost US\$1 billion in Q1 revenue to crude oil theft. *Reuters*. <https://www.reuters.com/world/africa/nigeria-lost-1-billion-q1-revenue-crude-oil-theft-2022-07-02/>
- 23 International Trade Administration. (2023, June 6). *Nigeria – country commercial guide*. <https://www.trade.gov/country-commercial-guides/nigeria-oil-gas-and-mining-sectors>
- 24 Ghaddar, A., Harvey, R., & Payne, J. (2024, February 15). Exclusive: Nigeria's new Dangote refinery to export first fuel cargoes. *Reuters*. <https://www.reuters.com/business/energy/nigerias-dangote-refinery-export-first-fuel-cargoes-2024-02-14/>
- 25 Barnard, P., Moomaw, W., Fioramonti, L., Laurance, W., Mahmoud, M., Sullivan, J., Rapley, C., Rees, W., Rhodes, C., Ripple, W., Semiletov, I., Talberth, J., Tucker, C., Wysham, D., & Ziervogel, G. (2021, October). World scientists' warnings into action, local to global. *Science Progress*. 10.1177/00368504211056290
- 26 Cointe, B., & Guillemot, H. (2023, January 18). A history of the 1.5°C target. *Wiley Interdisciplinary Reviews*, 14(3). <https://doi.org/10.1002/wcc.824>
- 27 VOCs refer to organic chemicals that easily evaporate at room temperature. They can escape the storage tanks along with methane gas, contributing to air pollution.
- 28 BTEX are a group of aromatic hydrocarbons commonly found in crude oil, gasoline and other petroleum products.
- 29 NO_x refers to a group of gases formed during high-temperature combustion processes like gas flaring. Common NO_x pollutants include nitric oxide (NO) and nitrogen dioxide (NO₂). These gases contribute to various environmental problems, including smog formation, acid rain and respiratory problems.
- 30 PM_{2.5} refers to fine inhalable particles with a diameter of 2.5 micrometers or less. These particles are small enough to penetrate deep into the lungs and cause various health problems, including respiratory illnesses, cardiovascular diseases and lung cancer.
- 31 Jalali, S., Karbakhsh, M., Momeni, M., Taheri, M., Amini, S., Mansourian, M., & Sarrafzadegan, N. (2021, October 28). Long-term exposure to PM_{2.5} and cardiovascular disease incidence and mortality in an eastern Mediterranean country: Findings based on a 15-year cohort study. *Environmental Health*, 20(1). 112. 10.1186/s12940-021-00797-w
- 32 Ibid.
- 33 Reading, E., Donahue, J., Cooley, D., Rowland, A., Schroll, J., Dietsch, N., Tobin, C., Hecht, J., White, A., Nguyen, L., Saab, R. A., Bueno, M., & All, O. (2022, November 10). *Societal benefits of methane mitigation*. Abt Associates. <https://www.abtglobal.com/insights/publications/white-paper/societal-benefits-of-methane-mitigation>
- 34 Ibid.
- 35 CCAC Secretariat. (2023, January 12). *Nigeria cements methane guidelines, and its role as an African climate and clean air leader*. Climate and Clean Air Coalition. <https://www.ccacoalition.org/news/nigeria-cements-methane-guidelines-and-its-role-african-climate-and-clean-air-leader#:~:text=Methane%20is%20a%20key%20ingredient,would%20prevent%2060%2C000%20prematu>
- 36 Ibid.
- 37 Ogunleye, J. (2019, September 9). *Putting out the fire: How Nigeria has quietly cut flaring by 70%*. Climate Policy in Action. <https://www.ccap.org/post/putting-out-the-fire-how-nigeria-has-quietly-cut-flaring-by-70>
- 38 Climate and Clean Air Coalition. (n.d.). *Nigeria*. [https://www.ccacoalition.org/partners/nigeria#:~:text=Nigeria%20has%20been%20a%20Climate,\(SLCPs\)%20mitigation%20is%20critical](https://www.ccacoalition.org/partners/nigeria#:~:text=Nigeria%20has%20been%20a%20Climate,(SLCPs)%20mitigation%20is%20critical)
- 39 *Nigerian Gas Flare Commercialization Programme*. (2024). <https://ngfcp.nuprc.gov.ng/#:~:text=The%20Federal%20Government%20of%20Nigeria's%20Commitment&text=In%20demonstration%20of%20its%20commitment,out%20target%20by%20year%202025>
- 40 The World Bank. (2023, December 5). *Global Flaring and Methane Reduction Partnership (GFMR)*. <https://www.worldbank.org/en/programs/gasflaringreduction/about>
- 41 CCAC Secretariat. (2020, January 10). *Nigeria and Cote D'Ivoire join Global Methane Alliance, a critical move in*

- fighting global warming*. Climate and Clean Air Coalition. <https://www.ccacoalition.org/news/nigeria-and-cote-divoire-join-global-methane-alliance-critical-move-fighting-global-warming>
- 42 Global Methane Initiative. (2024). *Nigeria methane emissions summary*. <https://www.globalmethane.org/partners/detail.aspx?c=nigeria>
 - 43 *Company members*. (2024). Oil and Gas Methane Partnership. <https://ogmpartnership.com/our-member-companies/>
 - 44 *A solution to the methane challenge*. (2024). Oil and Gas Methane Partnership. <https://ogmpartnership.com/a-solution-to-the-methane-challenge/>
 - 45 *List of OGMP 2.0 member companies*. (2024, April 30). Oil and Gas Methane Partnership. https://ogmpartnership.com/wp-content/uploads/2024/04/List_of_OGMP2.0_Member_Companies_30.04-1-5.pdf
 - 46 Federal Republic of Nigeria. (2021). *Adaptation Communication to the United Nations Framework Convention on Climate Change*. United Nations Framework Convention on Climate Change. <https://unfccc.int/sites/default/files/resource/Nigeria-Adaptation-Communication-UNFCCC-2.pdf>
 - 47 Federal Ministry of Environment. (2022, June 2). *Nigeria's Nationally Determined Contributions (NDCs) (Updated submission)*. United Nations Climate Change. <https://unfccc.int/documents/497790>
 - 48 *World leaders kick start accelerated climate action at COP26*. (2021, November 2). United Nations Climate Change. <https://unfccc.int/news/world-leaders-kick-start-accelerated-climate-action-at-cop26>
 - 49 *National Oil Spill Contingency Plan*. (2021, March). National Oil Spill Detection and Response Agency (NOSDRA). <https://nosdra.gov.ng/>
 - 50 *Nigerian Gas Flare Commercialization Programme*. (2024). <https://ngfcp.nuprc.gov.ng/#:~:text=The%20Federal%20Government%20of%20Nigeria's%20Commitment&text=In%20demonstration%20of%20its%20commitment,out%20target%20by%20year%202025>
 - 51 *The National Gas Policy, 2017*. (2017, July 12). Templars. <https://www.templars-law.com/knowledge-centre/the-national-gas-policy-2017/>
 - 52 *Nigeria Gas Masterplan* (2021, May). ALDG. <https://aldg.org.ng/wp-content/uploads/2021/05/NIGERIA-GAS-MASTER-PLAN.pdf>
 - 53 Department of Climate Change Federal Ministry of Environment. (2018, December). *Nigeria's National Action Plan (NAP) to reduce Short-Lived Climate Pollutants (SLCPs)*. <https://climatechange.gov.ng/wp-content/uploads/2020/09/nigeria-s-national-action-plan-nap-to-reduce-short-lived-climate-pollutants-slcp-s.pdf>
 - 54 Department of Climate Change Federal Ministry of Environment. (2021, July 2). *Nigeria's Nationally Determined Contributions (NDCs) (Updated submission)*. https://climatechange.gov.ng/wp-content/uploads/2021/08/NDC_File-Amended-_11222.pdf
 - 55 Department of Climate Change Federal Ministry of Environment. (2021, June 2). *National Climate Change Policy for Nigeria 2021–2030*. https://climatechange.gov.ng/wp-content/uploads/2021/08/NCCP_NIGERIA_REVISIED_2-JUNE-2021.pdf
 - 56 *Petroleum Industry Act, 2021*. (2021). PricewaterhouseCoopers International Limited. <https://pwcnigeria.typepad.com/files/petroleum-industry-act-2021.pdf>
 - 57 *Nigeria Energy Transition Plan: Oil and gas*. (2022). <https://energytransition.gov.ng/oil-and-gas-2-2/>
 - 58 Department of Climate Change Federal Ministry of Environment. (2021, November). *2050 Long-Term Vision for Nigeria (LTV-2050)*. United Nations Framework Convention on Climate Change. https://unfccc.int/sites/default/files/resource/Nigeria_LTS1.pdf
 - 59 Federal Republic of Nigeria. (2018, July 9). *Federal Government of Nigeria – Official Gazette*. Nigerian Upstream Petroleum Regulatory Commission (NUPRC). <https://www.nuprc.gov.ng/wp-content/uploads/2020/06/Flare-Gas-Prevention-of-Waste-Pollution-Regulations-2018.pdf>
 - 60 Department of Climate Change Federal Ministry of Environment. (2021, July 2). *Nigeria's Nationally Determined Contributions (NDCs) (Updated submission)*. https://climatechange.gov.ng/wp-content/uploads/2021/08/NDC_File-Amended-_11222.pdf

- 61 *National Oil Spill Contingency Plan*. (2021, March). National Oil Spill Detection and Response Agency (NOSDRA). <https://nosdra.gov.ng/>
- 62 Department of Climate Change Federal Ministry of Environment. (2018, December). *Nigeria's National Action Plan (NAP) to reduce Short-Lived Climate Pollutants (SLCPs)*. <https://climatechange.gov.ng/wp-content/uploads/2020/09/nigeria-s-national-action-plan-nap-to-reduce-short-lived-climate-pollutants-slcp-s-.pdf>
- 63 Oxford College of Marketing. (2018, April 23). *What is Mendelow's Matrix and how is it useful?* <https://blog.oxfordcollegeofmarketing.com/2018/04/23/what-is-mendelows-matrix-and-how-is-it-useful/>
- 64 Singh, H. (2022, April 24). *The Salience Model for stakeholder classification*. Deep Fried Brain. <https://www.deepfriedbrainproject.com/2017/09/salience-model-for-stakeholder-classification.html>
- 65 Climate and Clean Air Coalition (CCAC) (2021). *UN Environment Programme*. <https://www.unep.org/topics/energy/methane/climate-and-clean-air-coalition-ccac#:~:text=Published%20in%202021%20by%20the,45%20per%20cent%20this%20decade.>
- 66 Fernandes, P., Naran, B., Gupta, I., Wignarajah, D., Connolly, J., Patience, L., & Zhang, T. (2023). *Landscape of methane abatement finance 2023*. Climate Policy Initiative. <https://www.climatepolicyinitiative.org/wp-content/uploads/2023/11/Landscape-of-Methane-Abatement-Finance.pdf>
- 67 Ibid.
- 68 Ibid.
- 69 Ibid.
- 70 Ibid.
- 71 Ibid.
- 72 Ibid.
- 73 Ibid.
- 74 Ibid.
- 75 Ibid.
- 76 Ibid.
- 77 United Nations Environment Programme (UNEP) & Climate and Clean Air Coalition (CCAC). (2022, November 4). *Global methane assessment 2030: Baseline report*. <https://www.unep.org/resources/report/global-methane-assessment-2030-baseline-report>
- 78 Fernandes, P., Naran, B., Gupta, I., Wignarajah, D., Connolly, J., Patience, L., & Zhang, T. (2023). *Landscape of methane abatement finance 2023*. Climate Policy Initiative. <https://www.climatepolicyinitiative.org/wp-content/uploads/2023/11/Landscape-of-Methane-Abatement-Finance.pdf>
- 79 DeFabrizio, S., Glazener, W., Hart, C., Henderson, K., Kar, J., Katz, J., Pratt, M. P., Rogers, M., Tryggstad, C., & Ulanov, A. (2021, September 23). *Curbing methane emissions: How five industries can counter a major climate threat*. McKinsey & Company. <https://www.mckinsey.com/capabilities/sustainability/our-insights/curbing-methane-emissions-how-five-industries-can-counter-a-major-climate-threat#/>
- 80 International Energy Agency (IEA), United Nations Environment Programme (UNEP) & UNEP-convened Climate and Clean Air Coalition (CCAC). (n.d.). *The imperative of cutting methane from fossil fuels: An assessment of the benefits for the climate and health*. International Energy Agency (IEA). [https://www.ccacoalition.org/sites/default/files/resources/files/The imperative of cutting methane from fossil fuels.pdf](https://www.ccacoalition.org/sites/default/files/resources/files/The%20imperative%20of%20cutting%20methane%20from%20fossil%20fuels.pdf)
- 81 International Energy Agency (IEA). (2023, June). *Financing reductions in oil and gas methane emissions: A world energy outlook special report on the oil and gas industry and COP28*. <https://iea.blob.core.windows.net/assets/ff747fc8-a8d9-4eda-9bc9-0e2b628cb019/Financingreductionsinoilandgasmethaneemissions.pdf>
- 82 Ibrahim, A. (2023, July 17). Nigeria needs US\$1.4bn to reduce methane emissions by 2030. *Business Day*. [https://businessday.ng/energy/article/nigeria-needs-1-4bn-to-reduce-methane-emissions-by-2030/#:~:text=Nigeria%20will%20need%20up%20to,Agency%20\(IEA\)%20has%20shown](https://businessday.ng/energy/article/nigeria-needs-1-4bn-to-reduce-methane-emissions-by-2030/#:~:text=Nigeria%20will%20need%20up%20to,Agency%20(IEA)%20has%20shown)

- 83 International Energy Agency (IEA). (2021). *Curtailling methane emissions from fossil fuel operations: Pathways to a 75% cut by 2030*. <https://www.iea.org/reports/curtailling-methane-emissions-from-fossil-fuel-operations>; International Energy Agency (IEA). (2021). *Driving down methane leaks from the oil and gas industry: A regulatory roadmap and toolkit*. https://iea.blob.core.windows.net/assets/465cb813-5bf0-46e5-a267-3be0ccf332c4/Driving_Down_Methane_Leaks_from_the_Oil_and_Gas_Industry.pdf
- 84 Oil and Gas Climate Initiative. (2023, August 1). *OGCI publishes guidance to help oil and gas companies reduce their methane emissions*. <https://www.ogci.com/news/ogci-publishes-guidance-to-help-oil-and-gas-companies-reduce-their-methane-emissions>
- 85 International Energy Agency (IEA). (2023). *Global Methane Tracker 2023*. <https://www.iea.org/reports/global-methane-tracker-2023>
- 86 Ramalan, I. (2024, May 24). Nigerian govt to end gas flaring by 2030 – Minister. *Daily Nigerian*. <https://dailynigerian.com/nigerian-govt-gas-flaring/>
- 87 KPMG. (2023). *Empowering the energy transition*. <https://kpmg.com/us/en/articles/2023/enabling-empowering-energy-transition.html?utm>
- 88 Climate and Clean Air Coalition. (n.d.). *Benefits and costs of mitigating methane emissions*. <https://www.ccacoalition.org/content/benefits-and-costs-mitigating-methane-emissions>
- 89 TVC News Nigeria. (2022). *NOSDRA to develop satellite tracking too* [Online video]. YouTube. <https://www.youtube.com/watch?v=3wq3WmxMJ1I>
- 90 Federal Republic of Nigeria. (2023, July 12). *Gas flaring regulation*. Nigerian Upstream Petroleum Regulatory Commission (NUPRC). <https://www.nuprc.gov.ng/wp-content/uploads/2023/07/GAS-FLARING-REGULATIONS.pdf>
- 91 Department of Climate Change Federal Ministry of Environment. (2021, November). *2050 Long-Term Vision for Nigeria (LTV-2050)*. United Nations Framework Convention on Climate Change. https://unfccc.int/sites/default/files/resource/Nigeria_LTS1.pdf
- 92 *Nigeria's pathway to achieve carbon neutrality by 2060*. (2022). Nigeria Energy Transition Plan. <https://energytransition.gov.ng/>
- 93 International Energy Agency (IEA). (2023, June). *Financing reductions in oil and gas methane emissions: A world energy outlook special report on the oil and gas industry and COP28*. <https://iea.blob.core.windows.net/assets/ff747fc8-a8d9-4eda-9bc9-0e2b628cb019/Financingreductionsinoilandgasmethaneemissions.pdf>
- 94 Ibrahim, I. M. (2023, September 21). *Playing with fire: The impacts of gas flaring in Nigeria's oil and gas sector*. Prolific Practice. <https://www.prolificpractice.com/post/playing-with-fire-the-impacts-of-gas-flaring-in-nigeria-s-oil-and-gas-sector>
- 95 European Commission. (2022, June 17). *EU-US joint press release on the Global Methane Pledge Energy Pathway*. https://ec.europa.eu/commission/presscorner/detail/en/IP_22_3793
- 96 Irfan, U. (2023, December 11). Pledges to slash methane pollution at COP28 are leaving out one big thing. *Vox*. <https://www.vox.com/23996919/cop28-climate-methane-pledge-oil-gas-emissions-agriculture>
- 97 Highlights from 2023 Global Methane Pledge Ministerial. (2023, December 4). U.S. Department of State. <https://www.state.gov/highlights-from-2023-global-methane-pledge-ministerial/#:-:text=Rapidly%20reducing%20methane%20emissions%20advances,and%20energy%20security%20objectives%20simultaneously.&text=Pr>
- 98 2023 Global Methane Pledge Ministerial: decisive action to curb emissions. (2023, December 4). *European Commission*. https://ec.europa.eu/commission/presscorner/detail/en/statement_22_6827
- 99 International Energy Agency (IEA). (2023). *Global Methane Tracker 2023*. Paris, France: <https://www.iea.org/reports/global-methane-tracker-2023/the-case-for-methane-policy-and-regulation>
- 100 Mahmoud, M. I. (2023). *Gas flare and methane emissions detection in the Nigerian oil and gas sector*. National Oil Spill Detection and Response Agency (NOSDRA). https://www.unoosa.org/documents/pdf/psa/activities/2023/UN-Austria/Panel_1_NOSDRA_8Sep2023.pdf

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About the DCC

The Department of Climate Change (DCC) is the official information hub on climate change in Nigeria. It was established by the Federal Government of Nigeria under the Federal Ministry of Environment to serve as the vehicle for driving national climate actions and efforts. It was established with the broad mandate of coordinating activities towards national implementation of the national and international climate change agreements, including the Paris Agreement.

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