Global Energy Monitor

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# New Hubs of Gas Extraction in Africa

A seismic shift is on the horizon for gas extraction in Africa, with many of the new pre-production fields proposed in countries that historically have not exploited fossil fuels, a trend that would run counter to the global scientific consensus calling for a halt to the construction of new fossil fuel infrastructure.

Global Energy Monitor's (GEM) Global Oil and Gas Extraction Tracker (GOGET) includes data on 421 extraction projects, with 79 fields in the pre-production stages. While historically Nigeria, Egypt, Libya, and Algeria have had the most proven gas reserves and production, data in GOGET show that 84 percent of new reserves in pre-production are located in recent entrants to Africa's gas market—Mozambique, Senegal, Tanzania, Mauritania, South Africa, Ethiopia, and Morocco.

These new reserves total more than 5137.5 billion cubic meters (bcm), with potential emissions equaling about 11.9 billion tons of CO2, with production from many of these fields facing opposition due to the potential impacts to local ecosystems and communities.

These countries are expected to drive gas development volumes in the near term, with 'Mozambique, Mauritania, Tanzania, South Africa, and Ethiopia accounting for more than half of Africa's gas production by 2038.' If industry plans for this wave of new gas field extraction projects are allowed to proceed, Africa's gas production would increase by a third by 2030. An estimated US$329 billion greenfield investment is required for the development of both gas extraction and export infrastructure.

Yet most of these gas field developments are destined for export, doing little to address low electrification rates across the continent, while also exposing Africa's energy mix to the volatility of gas markets. African investment in the development of extraction infrastructure in previously undeveloped areas will likely lead to serious impacts on locals' health and the environment, while exacerbating climate change and reducing Africa's ability to invest in its own energy transition and the electrification of its communities.

**Table 1: Pre-production Reserves in Africa by Country**

| Country | Reserves (BCM) | Percent |
|---|---|---|
| Mozambique | 2307.4 | 44.9% |
| Senegal | 778.7 | 15.1% |
| Mauritania | 574.6 | 11.2% |
| Tanzania | 512.5 | 10% |
| Algeria | 192.7 | 3.7% |
| Egypt | 192.6 | 3.7% |
| Nigeria | 155 | 3% |
| Angola | 143.6 | 2.8% |
| Libya | 102.2 | 2% |
| South Africa | 96.3 | 1.9% |
| Ethiopia | 42.5 | 0.8% |
| Morocco | 39.4 | 0.8% |

Source: GEM Global Oil and Gas Extraction Tracker

This briefing details the emerging players in Africa's gas market, the key fields proposed for development, and the cost and ownership structure of this build-out and concludes that the export orientation of gas developments will do little to address the challenges Africa faces in achieving universal access to clean, affordable, and reliable energy.

## New market entrants and emerging trends

Historically, Algeria, Nigeria, Libya, and Egypt have dominated gas reserves and production in Africa. In 2021, according to the U.S. Energy Information Administration (EIA), these four countries accounted for 78 percent of African gas reserves. From 1970 to 2021, they accounted for 92 percent of all gas produced in Africa.

The discovery of new gas reserves in the Indian Ocean off the coast from Mozambique and Tanzania and in the Atlantic Ocean close to the border of Senegal and Mauritania has paved the way for the emergence of new entrants to the African gas market. A report by the African Energy Chamber describes Ethiopia, Mauritania, Mozambique, Senegal, South Africa, and Tanzania as "upcoming natural gas hubs."

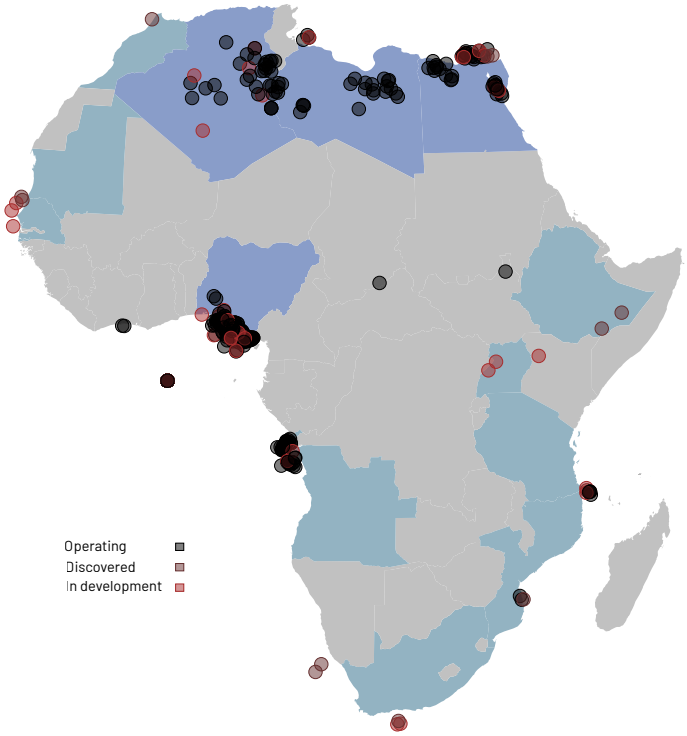
Data from Rystad shows that Mozambique is poised to become Africa's second largest gas producer, potentially contributing 18 percent of African gas production between 2020 and 2050. Oil Change International estimates that while Algeria, Egypt, Libya, and Nigeria will continue to dominate gas production in the near term, Mozambique and other new entrants will contribute more than 50 percent of gas production in Africa by 2038.

Of the new market entrants, Mozambique is the least electrified, with only 30 percent of the population having access to electricity. Tanzania, Mauritania, and Ethiopia also have low electrification levels of 40 percent, 47 percent and 51 percent, respectively. Compared to the other new market entrants, Senegal and South Africa have relatively high electrification levels with 70 percent and 84 percent, respectively, of the population having access to electricity.

Despite the low electrification levels and challenges in supplying affordable and reliable electricity, domestic demand in the power sector is suppressed. Much of the gas from new projects is not destined for domestic consumption, as many of the gas extraction fields in pre-production are associated with LNG export terminals. Algeria and Nigeria are expected to drive most of the African gas export volumes from 2022–2025, with additional export volumes from Equatorial Guinea, Egypt, Mozambique, Senegal, and Mauritania.

**Figure 1: Gas Extraction Sites in Africa**

"The Old Guard" (Algeria, Nigeria, Libya and Egypt) shown in blue, and "Upcoming Natural Gas Hubs" (Ethiopia, Mauritania, Mozambique, Senegal, South Africa and Tanzania) are shown in turquoise.



## Foreign interest in African gas

One of the key drivers of this exploration boom is the European Union search for diversified sources of gas outside of Russia. The EU imported 90 percent of its gas consumption in 2021, with Russian imports accounting for 45 percent. A fifth of EU gas imports came from Africa, of which Algeria contributed 12.6 percent. Following the Russian invasion of Ukraine, the EU has been striving to reach independence from Russian gas by 2030. However, the longevity of the EU's renewed interest in African gas remains to be seen, and new market entrants could find themselves indebted with assets that cannot be repurposed for domestic use without extraordinarily expensive infrastructure development.

Over 97 percent of the new LNG infrastructure planned for Africa is being built for export, mainly to Europe and Asia. According to Amos Wemanya, a senior analyst at Power Shift Africa, "From Mauritania to Mozambique, Europe's fossil fuel addiction is a major driver behind new LNG projects." However, under the European Climate Law, the EU as a whole aims to reduce gas demand by 35 percent compared to 2019 levels by 2030. Additionally, the European Commission's REPowerEU proposal from May 2022—if fully implemented—could also entail a 52 percent reduction in EU gas demand by 2030, again compared to 2019.

Europe's current interest in African gas is clearly fueled by a short to medium-term supply crisis, while significant volumes of gas from in-development African projects will only come online much later this decade, potentially stranding that gas without a buyer. Furthermore, the assumed growth in Asian LNG remains in flux, with countries that once faced the prospect of being priced out of the LNG market now considering a return as prices trend downwards.

## Key projects by new market entrants

Several key projects are expected to drive near-term development volumes in the Africa gas market. The first LNG project in Mozambique, Coral South FLNG, was commissioned in 2022. The larger Golfinho-Atum, also in Mozambique, has reached a financial investment decision with construction underway.

Other gas extraction projects in pre-production include the Greater Tortue Ahmeyim, Zafarani, and Mamba projects in Mauritania, Senegal, and Mozambique, respectively. These projects will have significant impacts on the communities and biodiversity in the area.

| Project details | Summary |
|---|---|
| Project name: Coral/Coral South, Mozambique<br>FID: 2017<br>Start Date: November 2022<br>Current Status: Operating<br>Associated LNG Project: Coral South FLNG Terminal | The 2,647 million barrels of oil equivalent (MMBOE) Coral field, operated by Eni, was discovered in 2012 in Area 4. The Coral South FLNG installation project, operated by Eni, sources gas from Coral and then liquefies it using a floating plant. Coral Sul FLNG shipped its first cargo of LNG in November 2022.<br><br>Coral field has reserves of around 450 bcm (2,647 MMBOE), while the entire complex holds 2.4 tcm (14,119.20 MMBOE). The FLNG installation has a gas liquefaction capacity of 3.4 million tons per year (mtpa).<br><br>The project has led to the destruction of local communities and other significant impacts. |

| | |
|---|---|
| Project name: Luiperd,<br>South Africa<br>Anticipated FID: 2024<br>Anticipated start date: 2026<br>Current Status: In development<br>Associated LNG Project: | The 105 MMBOE field is located 175 km off the South African southern coast. The field is operated by TotalEnergies. Discovered in October 2020, production is expected to begin by 2026. TotalEnergies plans to expedite production by linking the Luiperd field to a PetroSA offshore production platform via pipeline. |
| Project name: Brulpadda, South Africa<br>Anticipated FID:<br>Anticipated start date: 2027<br>Current Status: In development<br>Associated LNG Project: | Brulpadda is a 217 MMBOE gas field. In 2014, initial attempts to drill the Brulpadda prospect were suspended due to challenges in drilling the deepwater field.<br><br>Subsequent attempts were successful in February 2019, paving the way for development. The field is operated by TotalEnergies and is expected to begin production in 2027. Upon completion, the field will supply the existing Mossel Bay gas-to-liquid plant.<br><br>A 2022 NGO report notes that Brulpadda and Luiperd are in an area of "spectacular marine biodiversity" adding that scientists have condemned the development due to its impacts on the climate and ecosystem. |
| Project name: Golfinho-Atum, Mozambique<br>FID: 2019<br>Anticipated start date: 2026<br>Current Status: In development<br>Associated LNG Project: Mozambique LNG Terminal | The Golfinho-Atum gas complex is operated by TotalEnergies. The 2,654 MMBOE complex is located in Area 1, 40 km from the coast of Mozambique. Discovered in 2012, Golfino-Atum is currently in development and is expected to start operations in 2026. Upon completion, Golfinho-Atum would supply Mozambique Area 1 LNG plant, which is expected to have a production capacity of 12.88 mtpa and to export LNG to Europe and Asia.<br><br>The Mozambique Area 1 project was approved in 2019 and is funded by the African Development Bank. Export credit agencies from the UK, USA, Japan, Thailand, Netherlands, Italy, and South Africa have also reportedly backed the project. TotalEnergies reportedly announced plans to restart the associated LNG terminal, which had been shelved indefinitely due to violence in the region. |
| Project name: Mamba, Mozambique<br>Anticipated FID:<br>Anticipated start date: 2024<br>Current Status: In development<br>Associated LNG Project: Rovuma LNG Terminal | The 5,344 MMBOE Mamba gas complex, operated by Mozambique Rovuma Venture, was discovered in 2011 in the Area 4 block. It is the initial source for the Rovuma LNG project.<br><br>The Rovuma Mozambique LNG includes two LNG trains with a capacity of 15.2 mtpa. The project has had significant impacts on fisheries and fishing communities due to dredging and other activities. |

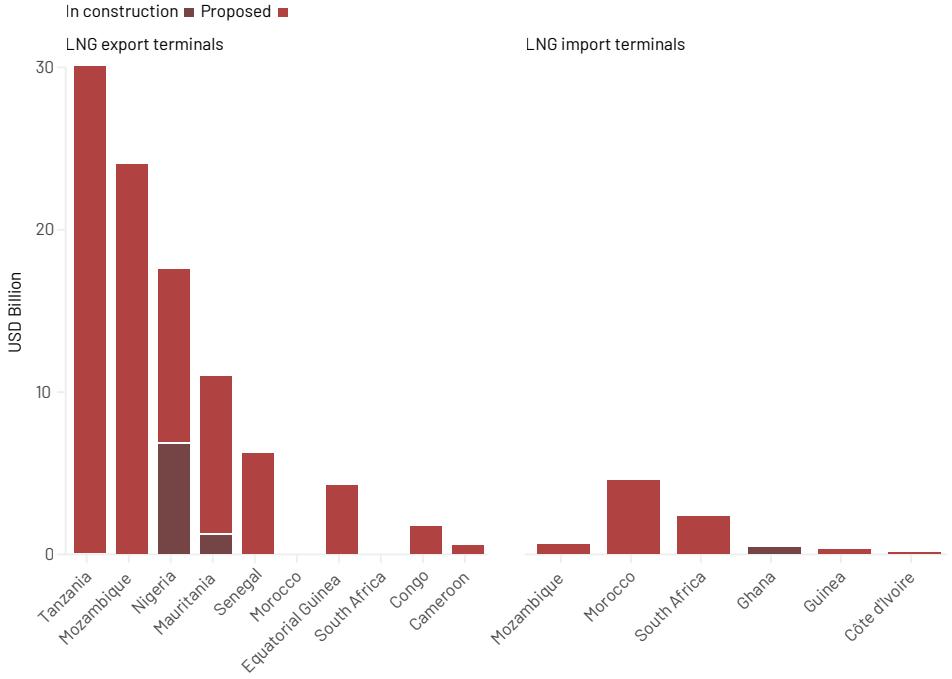
| | |
|---|---|
| Project name: Greater Tortue Ahmeyim, Senegal-Mauritania<br>Anticipated FID: 2018<br>Anticipated start date: 2023<br>Current Status: In development<br>Associated LNG Project: Greater Tortue Ahmeyim FLNG Terminal | The Greater Tortue Ahmeyim LNG project is operated by BP and located on the maritime border of Mauritania and Senegal. The project sources gas from the Tortue and Ahmeyim fields, which were discovered in 2014 and 2016, respectively. Together, the fields have gas reserves of 2,505 MMBOE (15 trillion cubic feet).<br><br>The FLNG scheme is designed with a capacity of 2.5 mtpa aimed at domestic use and global export. BP and partner Kosmos are preparing an expansion to double the FLNG capacity to 5 mtpa.<br><br>A 2022 NGO report declared "The GTA project is a serious threat to the coastal ecosystems and the people of Mauritania and Senegal." |
| Project name: Zafarani, Tanzania<br>Anticipated FID:<br>Anticipated start date: 2028<br>Current Status: Discovered<br>Associated LNG Project: Tanzania LNG Terminal | The 2,153 MMBOE gas field was discovered by Equinor (then known as Statoil) within Tanzania's Block 2 in 2012. The field is operated by Equinor and is expected to begin production in 2028. Shell is expected to work with Equinor on an LNG project to develop the reserves of Block 2 and export them to international markets via the 7.5 mtpa LNG plant, while having some of the gas stay domestic. Block 2 is estimated to hold more than 20 TCF (3,340 MMBOE) of gas. |
| Project name: BirAllah, Mauritania<br>Anticipated FID: 2025<br>Anticipated start date: 2028<br>Current Status: Discovered<br>Associated LNG Project: BirAllah LNG Hub | The 2,131 MMBOE field was discovered in 2015 and is operated by BP. As of 2022, BP was considering targeting sales of LNG from BirAllah to Europe. |
| Project name: Yakaar-Teranga, Senegal<br>Anticipated FID: 2022<br>Anticipated start date: 2024<br>Current Status: In development<br>Associated LNG Project: Yakaar-Teranga LNG Hub | The 456 MMBOE project is operated by BP. Discovered in 2016, the Yakaar-Teranga field will feed the Yakaar-Teranga LNG Hub (10 mtpa). |

## Estimated investment for planned gas extraction infrastructure

Data from Rystad UCube shows that greenfield investment is expected to bring the new entrants to Africa's gas market up to the level of the old guard in terms of top capital expenditures for oil and gas production. An increase in greenfield spending is expected in the second half of the decade, as many of the greenfield projects begin to see a financial investment decision.

GEM data estimates the total capital expenditure for in-development LNG terminals to be US$103 billion, 92 percent of which is for LNG export terminals. The top five countries leading LNG export terminal development in Africa are Tanzania, Mozambique, Nigeria, Mauritania, and Senegal. Besides Nigeria, all of these countries are among the new market entrants driving gas extraction in Africa.

**Figure 2: Estimated investment for planned LNG export terminal infrastructure**

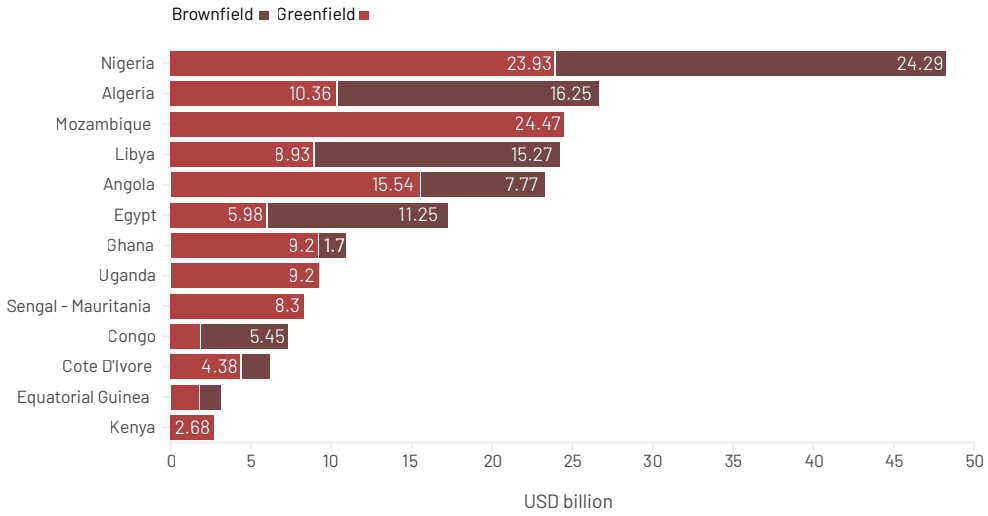



Source: GEM Aftrica Gas Tracker

## Trends in ownership of in-development gas fields

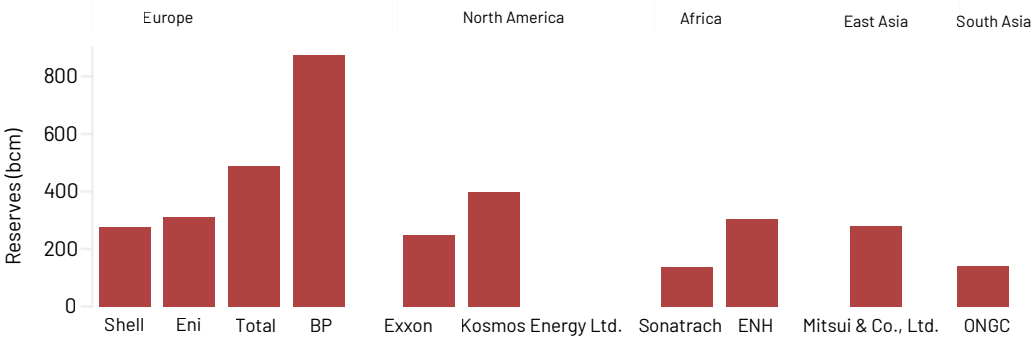
GEM data show that companies headquartered in Europe own the majority of reserves of new gas fields in Africa. The Algerian and Mozambican state-owned companies, Sonatrach and Empresa Nacional de Hidrocarbonetos (ENH) are the only African companies among the top ten companies by reserve volume of new gas fields in Africa. The combined share of Asian, North American, and European companies is more than half of the reserve volume of new gas fields owned by the top ten companies operating in Africa. The British and French companies BP and TotalEnergies are the largest developers of new gas reserves in Africa. In 2021, 25 percent of TotalEnergies' hydrocarbon production came from Africa. The dominance of multinational corporations implies that much of the profit to be made from these projects is not destined for the African continent.

**Figure 3: Cumulative 2020-2025 oil and gas CAPEX for top African countries**




Source: The State of African Energy 2023 Outlook analysis based on Rystad UCube data

**Figure 4: Top companies by reserves of new gas fields in Africa**




Source: GEM Global Oil and Gas Extraction Tracker

## Conclusion

While Algeria, Nigeria, Libya, and Egypt will continue to be big players in the production of gas in Africa, new market entrants will claim a growing market share. However, many of the in-development gas extraction fields are explicitly tied to new or existing LNG export terminals. Much of the gas from new projects is destined to leave Africa, possibly for Europe and Asia. Investment in LNG export terminals continues to take priority even as African countries are faced with unmet domestic demand and limited electricity access. Growing domestic demand to meet Africa's own energy needs and the shrinking window of opportunity to exploit EU and Asian markets threaten the long term success and durability of new market entrants' plans.

## Methodology

Global Energy Monitor is a nonprofit research organization developing information on energy projects worldwide. In 2022, Global Energy Monitor launched its Africa Gas Tracker (AGT). The tracker is an online database that identifies and maps major gas transmission pipelines, gas-fired generating units (50 MW and larger), LNG terminals, and gas extraction sites. Following our latest update, the tracker now includes 64 GW of gas plants in development, 75 mtpa LNG terminal capacity in development, 22,600 km of gas pipelines in development, and 60 gas extraction areas in pre-production stages. The AGT uses footnoted wiki pages to document each pipeline, gas-fired power plant, LNG terminal, and extraction site and is updated biannually.

GOGET is a global dataset of oil and gas resources and their development. GOGET includes information on discovered, in-development, and operating oil and gas units worldwide, including both conventional and unconventional assets. The dataset tracks the status, ownership, production, and reserves of each unit, as data is available.

GEM estimates investment in LNG terminals in development by summing projected capital expenditures for each project within a region. Where reported project cost data are not available from secondary research, GEM produces its own cost estimates based on global and regional averages. North Africa and Sub-Saharan Africa terminal costs are estimated differently when there is sufficient data to support a regional average; otherwise, cost estimates are inferred from global averages. For LNG import terminals, estimated costs are US$269.7 million per mtpa for onshore facilities and US$134.7 million per mtpa for floating facilities. For LNG export terminals, estimated costs are US$544.8 million (for North Africa) and US$623.6 million

(for Sub-Saharan Africa) for onshore facilities, and US$567.5 million per mtpa for floating facilities.

Emissions were calculated using a proxy from the Oil Climate Index Plus Gas (OCI+) for a barrel of crude from Egypt's Zohr field: 394 kg CO2e/boe, using a 100-year GWP for methane. OCI+ values for emissions intensities were then multiplied by estimates for reserves from the field, drawing on GOGET data.

## Acknowledgements

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For further details see the tracker landing page and methodology overview. Visit the Download Data page to obtain primary data from the AGT.

For more information contact: Christine Juta, Project Manager, Africa Gas Tracker, Christine.Juta@globalenergymonitor.org

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