

Senegal's Big LNG Gamble

Unpacking the risks

IISD REPORT



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Senegal's Big LNG Gamble: Unpacking the risks

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Executive Summary

Senegal faces difficult decisions as it navigates a transition to becoming an exporter of liquefied natural gas (LNG) with a pipeline of new projects, largely targeting Europe. The need to develop new sources of government revenues must be balanced with meeting domestic energy needs and avoid locking in an economically unsustainable energy pathway.

Senegal has committed to ramp-up both renewables and gas to respond to its domestic energy needs and is exploring further LNG extraction. LNG plant and pipeline expansion occurs over a minimum of 5 years, with operationalization requiring another 3 to 5 years before gas is produced. The prospect of new LNG developments depends on their return on investment: for expansion to be justified LNG projects must not only be profitable, but benefit Senegal.

As a new player in the LNG space, Senegal will likely face challenges, such as security concerns with potential implications for socio-economic indicators; potential risks, including long-term over-reliance on fossil fuel revenue; uncertainty in offtake contracts; and potential stranded assets due to market dynamics. To navigate these risks, investments should prioritize long-term solutions for the domestic energy supply without undue reliance on export to international fossil fuel markets. Cautious consideration and planning should be given to the possibility of declining global demand for LNG in the 2030s. Strategic public spending and a managed energy diversification plan can reduce exposure to LNG markets, mitigate risks, and support Senegal's transition to sustainable energy.

This report explores Senegal's nascent LNG industry by assessing the risks associated with a new fossil fuel-based industry on the country's environment, economy, and society. It does this by responding to three questions:

- What have been the impacts of the development of LNG on Senegal to date?
- Is it viable for Senegal to invest further into an industry that is projected to decline?
- What risks can Senegal expect should it forge ahead with its LNG development plans?

Key Findings

LNG for Economic Development

Senegal's economic strategy banks on an increase in economic growth due to new LNG exports driven by its gas exploration plans. However, the global LNG industry is highly competitive with prices that rely on market performance, which often fluctuate. Thus, LNG production in Senegal will face competition in global demand and fiscal challenges. Sustainable economic growth will require revenue generation mechanisms that extend beyond the energy sector.



Viability of LNG for Energy Development

Senegal has, somewhat controversially, included natural gas in its Just Energy Transition Investment Plan—a blueprint for the development of the energy transition in Senegal. Just Energy Transition Plan agreements are bilateral deals between groups of donor and recipient countries that aim to support the energy transition, balancing decarbonization with the need to supply energy for domestic purposes (International Energy Agency, 2024). To date, energy policies have encouraged the use of liquefied petroleum gas and attempted to reduce reliance on solid biomass in urban areas. Despite progress, challenges remain in achieving widespread access to electricity.

Senegal's LNG projects like the Greater Tortue Ahmeyim and Yakaar–Teranga are a key part of the country's plans for domestic energy supply, but for LNG to supply the domestic market, Senegal will need additional pipeline infrastructure. Risks associated with investment and cost recovery for domestic infrastructure must be understood through further pricing and funding studies. Further risks of socio-economic impacts on communities located along exploration sites must also be taken into account.

Risks Associated with LNG Development in Senegal

These risks underscore the complexity and challenges associated with scaling up LNG production in Senegal. IISD recommends careful planning and consideration of both domestic and international factors before LNG expansion plans are put in place.

Risk 1: Much of the revenue from LNG may never reach the government budget

Revenue from LNG production may not directly benefit the government budget, as it may be reinvested into further LNG infrastructure development. The new Senegalese oil code introduces increased royalties and state participation, impacting the net revenue received by the government. Moreover, the government is betting on LNG being profitable over a long-term period, which may concentrate risk and further entrench Senegal's dependence on fossil fuel-based revenues.

Risk 2: Long-term export demand for gas from Senegal is uncertain

The lengthy timeline from discovery to production in sub-Saharan Africa suggests that new LNG projects may not reach production before the mid-2030s. Senegal's LNG has higher breakeven prices as a new entrant into the market compared to major LNG producers. This means it may run at a loss. Long-term offtake contracts may appear to offer the promise of stable revenue, but in practice, offtake agreements are often indexed to market prices or may be cancelled if they become consistently unprofitable to honour.

Risk 3: Pressure to export has a higher potential for stranded assets and may stunt domestic energy security

Investment in pipeline infrastructure and power plant conversions is required for domestic gas consumption, posing financial viability challenges. Financing LNG infrastructure may favour



projects committed to exporting more production, potentially neglecting national demand. The risk of asset stranding increases as projects are dependent on international demand. This creates a potential situation where national energy supplies are threatened by falling global demand due to production assets becoming stranded and national demand being insufficient to keep them operating.

Recommendations

Re-evaluate LNG Development Driven by Global Demands

Given the uncertainty of revenues, government policy must consider a scenario in which LNG-related revenues are negligible. This could occur due to excess capacity, a drop in demand, project delays, or successful lobbying efforts that reduce the government's share—most likely some combination of several of these factors. A strategy that relies on optimistic revenue estimates to fund borrowing and fiscal expenditures is extremely risky; whereas a strategy in which a high proportion of revenues are saved and used strategically has a lower risk to the economy.

Prioritize Clean Energy Development

Prioritize investments in renewable energy infrastructure and promote energy efficiency measures to reduce reliance on fossil fuels and mitigate climate change impacts. Domestic renewable energy production doesn't face the risks listed in this document. Align fiscal policies and incentives with sustainability objectives to incentivize responsible investment in clean energy and promote a just transition to a low-carbon economy.

Revenues Should be Strategically Spent to Develop the Domestic Economy

To avoid simply using LNG revenues for day-to-day fiscal spending, a portion of revenues should be diverted toward funding “strategic” priorities, either by supporting the existing sovereign wealth fund (Fonds Souverain d'Investissements Stratégiques) that may be repurposed for this task, or by earmarking funds for capital investments that are designed to bring long-term benefits to Senegal.

Minimize Environmental and Socio-economic Risks

Senegal can prioritize comprehensive community engagement processes and conduct thorough social impact assessments before and during LNG project development. This includes actively involving local communities in decision-making processes, addressing their concerns, and ensuring equitable distribution of benefits. Implementing community development initiatives and livelihood support programs can mitigate adverse socio-economic impacts, particularly for vulnerable groups.



Diversify Revenue Streams

Recognize the inherent volatility of fossil fuel markets and diversify revenue streams to reduce dependency risks. Invest in alternative sectors, such as renewable energy, agriculture, tourism, and manufacturing, to foster economic diversification and resilience. Promote innovation and entrepreneurship to unlock new opportunities for sustainable economic growth and job creation.



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Abbreviations and Acronyms

FID	Final Investment Decision
GTA	Greater Tortue Ahmeyim
IEA	International Energy Agency
LNG	liquefied natural gas
MTPA	million tonnes per annum
NZE	net-zero energy



1.0 Introduction

Senegal's population grew by 2.57% in 2023 (International Energy Agency [IEA], 2024), driven by a burgeoning young demographic. It projected an economic growth of 5.3% in 2023, 10.6% in 2024, and 7.5% in 2025, credited to the growing oil and gas industry (International Monetary Fund [IMF], 2023). However, Senegal also faces challenges, including war spillovers, financing constraints, political instability, and a widening fiscal deficit with increasing government debt (IMF, 2023).

To prioritize domestic energy needs, Senegal aims to earmark a significant portion of liquefied natural gas (LNG) production for local use, given only 75% of the population has access to electricity (IEA, 2024). The current energy mix includes 67% heavy fuel oil, 12% coal, 12% solar, and 9% imported large hydropower (IEA, 2024). Despite strides in renewable energy promotion, Senegal's electrification rate has prompted policies encouraging the use of liquefied petroleum gas and reducing reliance on solid biomass in urban areas.

The surge in LNG gas developments in Africa post-COVID-19 is largely attributed to gas shortages stemming from the Russia-Ukraine war in Europe. While pre-existing LNG explorations were underway in Senegal, this research aims to investigate the extent to which Europe's "dash-for-gas" has influenced Senegal's LNG development trajectory. This paper explores Senegal's nascent LNG industry by assessing the risks associated with LNG production, development, and consumption to the country's environment, economy, and society. It does this by responding to three questions:

- What have been the impacts of the development of LNG on Senegal to date?
- Is it viable for Senegal to enter further into an industry that is projected to decline?
- What risks can Senegal expect should it forge ahead with its LNG development plans?



2.0 Overview of LNG Projects

This section explores existing and newly planned LNG projects in Senegal and their implications for its population.

Figure 1. Senegal's LNG projects in development



Source: Author diagram based on Offshore, 2020.

**Table 1.** LNG projects in development in Senegal

Project	Expected date of operation	Project developers	Proposed production capacity	Status	Sources
Greater Tortue Ahmeyim	2024	BP, Kosmos Energy, Societe des Petroles du Senegal (Petrosen), and Societe Mauritanienne des Hydrocarbures (SMHPM)	2.3 MTPA (Phase 1) 2.5 to 3 MTPA (Phase 2)	Under development, 90% completion in 2023	(Offshore Technology, 2023) (BP, 2023)
Yakaar-Teranga	2026	Kosmos Energy and Petrosen ¹	Up to 10 MTPA	Under development	(Energy Capital & Power, 2024) (GEM wiki, 2024)
Sangomar ² (oil and gas project)	2024	Woodside Energy, Petrosen	Up to 0.6 MTPA ³	Under development	(Petroleum Australia, 2024) (Woodside Energy, 2024) (Energy Capital & Power, 2023)

MTPA = million tonnes per annum

Source: Authors' compilation.

The Greater Tortue Ahmeyim (GTA), a USD 4.8 billion project jointly backed by BP and Kosmos Energy, is located offshore between Mauritania and Senegal. Both countries signed a memorandum of understanding for cooperation in upstream hydrocarbon activities, leading to the Inter-government Cooperation Agreement in February 2018 (Ouki, 2020). Originally planned to commence production in 2022, delays caused by the COVID-19 pandemic pushed the timeline back. The GTA is a multiphase project comprised of a first phase of 2.3 MTPA and a second phase of 2.5-3 MTPA. It has been reported that the capacity of the project could reach a total of 5 MTPA, revised from the initially planned 10 MTPA, due to post-

¹ Senegalese petroleum company, Petrosen, 99% state-owned.

² Sangomar contains both oil and gas, with oil accounting for most of the output expected from the project (Woodside Energy, 2024). It is included here due to its magnitude and impact on the broader oil and gas developments in Senegal, which are expected to impact Senegal's economic developments.

³ There is very little publicly available information on gas production values from Sangomar and this estimate is from one source (Energy Capital & Power, 2023) and could not be compared with any other source.



pandemic cost cutting strategy revision (Raystad Energy, 2024) once all the project phases⁴ are completed, divided between Senegal and Mauritania (Offshore Technology, 2023). The Final Investment Decision (FID) for the first phase of the GTA project was announced in 2018 (Kosmos Energy, 2022).

The Yakaar–Teranga project was discovered in 2014 and was later launched by the Senegalese government and Kosmos Energy in 2016, projected to produce 10 MTPA of gas. Phase 1 of this project aims to provide domestic gas and data to optimize future expansion (Power Engineering, 2019). The Yakaar-Teranga project awaits an FID in 2024. Additionally, Senegal's Sangomar project, led by Woodside Energy, contains both oil and gas reserves. It commenced oil production in June 2024 (Woodside Energy, 2024), with an anticipated daily output of 75,000 to 100,000 barrels of oil, contributing to Senegal's energy sector (Energy Voice, 2021). Its gas reserve potential and capacity has not been confirmed; thus, details are not widely available.

2.1 Socio-Economic Impacts

Natural resource conflicts are explained by two theories a) the scarcity theory and b) the abundance theory (Schellens et al., 2020). The scarcity theory explains the issues that arise due to a decrease in the supply of natural resources from overexploitation or pollution, economic deprivation, and severe environmental stresses. The abundance theory explains the *resource curse* which suggests that wealth from resources can cause neglect of other sectors, fostering economic disparities and creating a breeding ground for conflict (Schellens et al., 2020). Aspects of both theories are at play as LNG development impacts regional economies and the environment, and the burgeoning LNG industry begins to assert more political power.

Senegal has not had violent insurgencies since its first LNG exploration in 2014, however communities located along the coastline near the GTA project have experienced socio-economic issues, mostly affecting women and youth. Fishing has been the main economic activity and source of income for communities located in this region, however, many fishermen lost their jobs as LNG exploration restricted access to fertile fishing areas, known locally as *diattara*. This was reported to result in some women resorting to prostitution to support their families (Rédaction Africanews and Agencies, 2023).

2.2 Energy Access

In December 2018, Senegal introduced a gas-to-power strategy as part of its Emerging Senegal Plan, envisioning economic transformation, human capital development, and good governance by 2035. This strategy includes ramping up renewable energy and utilizing gas for domestic needs and exports, particularly through two major LNG projects expected to come online in 2025 and 2026.

⁴ The GTA is projected to have 2 to 3 phases with a total of 10 MTPA. However, some sources refer to only two phases. For the sake of this report, we have not specified how many phases the project will ultimately have, and the 10 MTPA remains a projection and not the actual expected capacity, as this will depend on the progression of the project and its completion.



Despite progress in energy accessibility, including achieving 75% electricity and 30% clean cooking fuels access, Senegal plans to ramp-up domestic energy provision from its two major LNG projects which are expected to come online 2024–2025 (Huhdanmäki, 2022). However, infrastructure for gas utilization, like pipelines, is necessary for the project to successfully meet these plans (Davis & Mihalyi, 2021).

Until offshore gas is available, Senegal plans to import LNG and convert existing heavy fuel plants into gas-to-power facilities, with an estimated capacity of between 400 and 500 megawatts. These initiatives aim to lower electricity costs, foster local economic growth, and enhance competitiveness through increased local content development (IEA, 2024).

2.3 Environmental Impacts

While Senegal's LNG development is still in its infancy, it is essential to anticipate potential environmental impacts as the sector grows. The World Bank's 2017 environmental, health, and safety guidelines outline performance standards for LNG facilities, covering liquefaction plants, transport, storage, regasification, and fuelling infrastructure. Specific environmental concerns include hazardous material management, wastewater discharge, air emissions, waste management, noise pollution, and spill risks (World Bank Group, 2017).

The LNG gas fields are located close to a significant cold-water reef, raising concerns about potential ecosystem harm. The gas extracted from GTA and all other gas extraction projects will be transported to floating LNG facilities located 10km offshore, pivotal in the LNG supply chain. However, these facilities pose environmental risks, such as operational emissions and potential accidents or leaks (Climate Action Tracker, 2022).

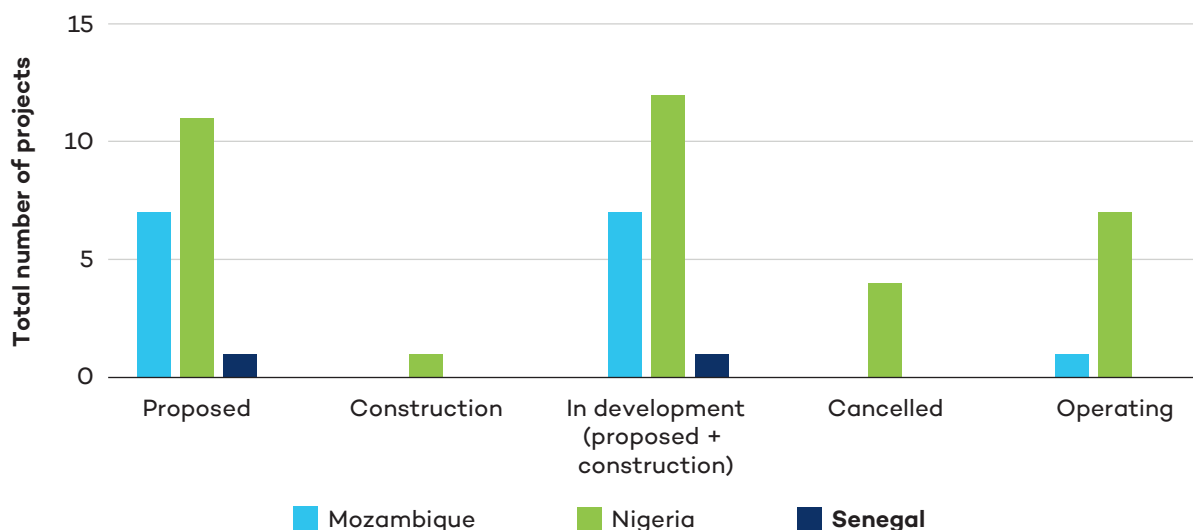


3.0 Economic Factors

3.1 Business Case

The construction of LNG terminals takes about four years, post-FID decision and capital availability (PwC, 2019). Senegal has fewer projects under development for export compared to other sub-Saharan LNG players, Mozambique and Nigeria (Figure 2). As indicated in section 2, the first phase of the GTA has been pushed forward to 2026 latest (Power Engineering, 2019).

Figure 2. LNG export projects in Senegal, Nigeria, and Mozambique



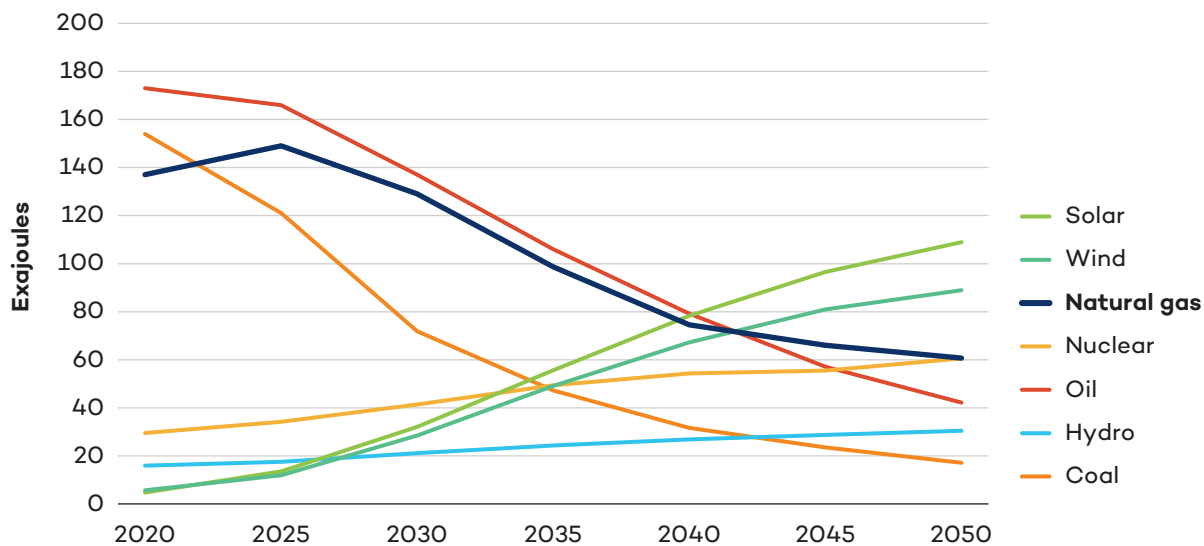
Source: Developed with data from Global Energy Monitor, 2022.

LNG production can be shaped by capital intensive investment and the long lead times of export projects (IEA and Korea Energy Institute, 2019). Despite initial delays and cost overruns, the Yakaar-Teranga project secured BP as its exclusive off-taker for LNG. Plans for GTA Phase 2 envision an additional 2.5–3 MTPA of LNG annually by 2027–2028 (Offshore Technology, 2023).

Senegal’s efforts to secure long-term contracts face hurdles due to global commitments toward ramping up clean energy generation (Marquardt & Kachi, 2023). The IEA’s current global net-zero energy (NZE) scenario projects reductions in fossil fuel-based energy supply from 2025 onwards (Figure 3). By 2050, fossil fuel-based energy demand is also projected to decline 90% for coal, 75% for oil, and 55% for natural gas (IEA, 2021). If realised, this outcome holds significant implications for investors, national development, and Senegal’s broader agenda on ramping up LNG for exports in a decarbonizing world (Energy Capital & Power, 2023; Offshore Engineer Digital, 2023).



Figure 3. Change in natural gas supply under the NZE scenario by 2050



Source: Developed with data from IEA, 2021.

3.2 Revenue Generation

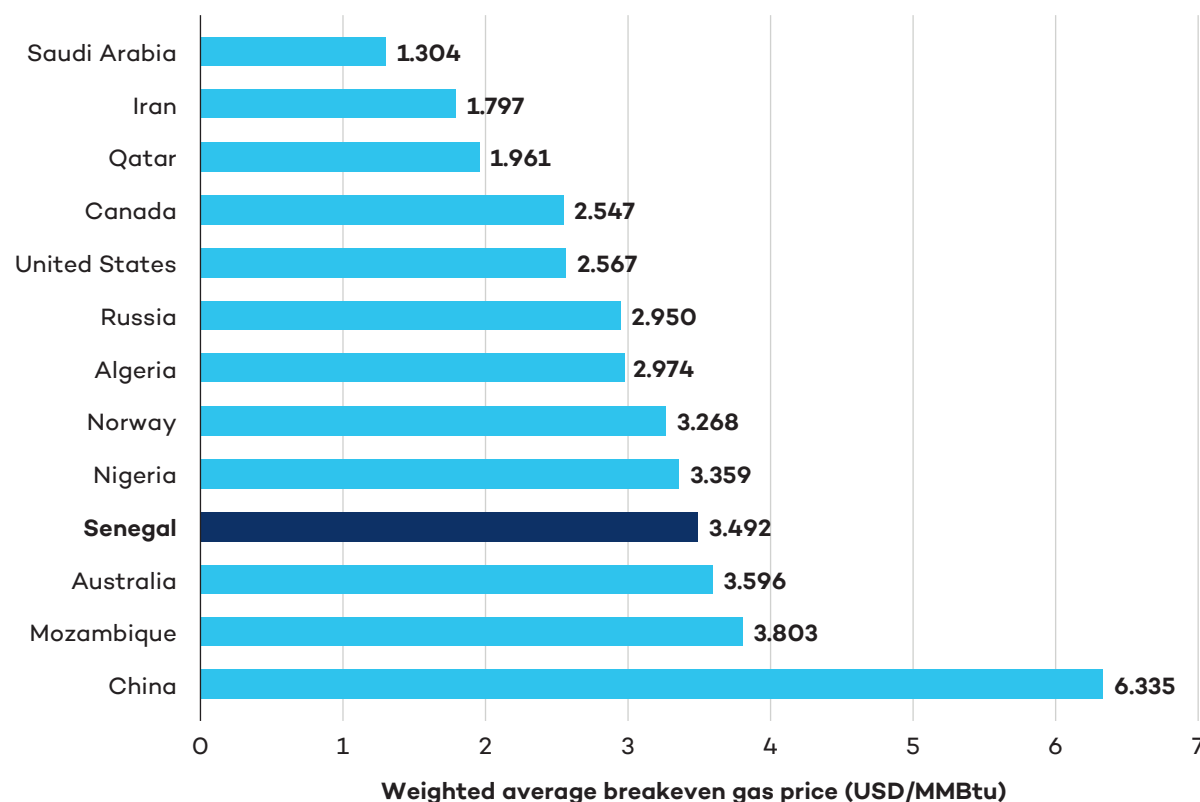
The discovery of oil and gas resources often leads to speculation that there will be an “economic boom” (Extractives Global Programmatic Support, 2018). However, the fiscal regime for gas projects must strike a balance. If it leans too much toward supporting gas development, projects may yield minimal public budget benefits; if support is lacking, projects may not materialize, particularly if supply surpasses demand and more expensive projects lose viability (Davis & Mihalyi, 2021).

Broadly, the economic impact of LNG development hinges on technical field performance, global market dynamics, and effects on related industries (Adekoya et al., 2024). In 2019, the IMF analyzed the projected economic impact of oil and gas, noting that deficits during the “pre-production” phase can only be justified if there are sustained high revenues amid slow decarbonization and reduced LNG demand. Despite this, IMF forecasts for Senegal suggest fossil fuel export revenues may average 1.5% of GDP from 2022 to 2043, peaking at 3%. This translates to 6% of total government revenues on average, peaking at 16% in 2030 (IMF, 2019). This analysis indicates a potential for substantial government revenues that may be derived from LNG, but revenues are not at a scale that could enable Senegal to substantially alter its economic model to become a resource-dependent economy. With this in mind, it would be wise to allocate revenues toward economic diversification needs and ensure they contribute to long-term strategic goals, such as Senegal’s decarbonization plans.



To assess national competitiveness, the authors calculated the weighted average breakeven gas price⁵ to determine the relative costs needed for projects to be economically viable. The breakeven gas price (Figure 4) is a useful indicator for assessing aggregated operational costs and the relative competitiveness of gas production. Higher breakeven gas prices imply increased vulnerability to stranded asset risks, as most national production would become commercially unviable if global gas prices drop below their domestic breakeven prices. Relatively high breakeven gas prices signal higher production costs and lower profit margins for domestic gas producers, which could impact investment decisions and market competitiveness.

Figure 4. Global LNG breakeven analysis



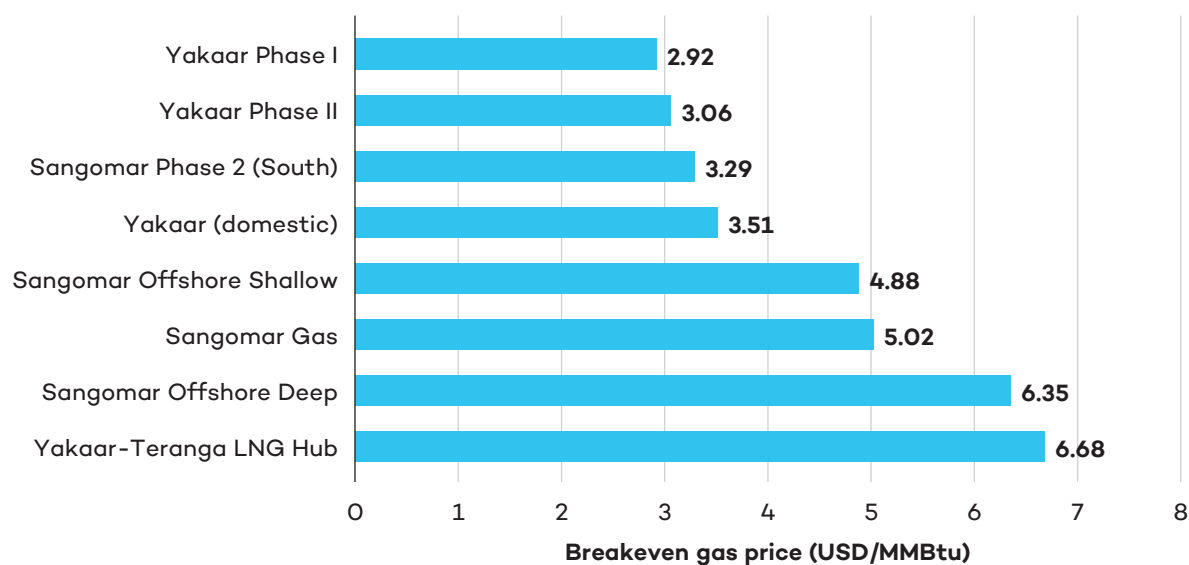
Source: IISD analysis based on Rystad UCube data.

IISD has also analyzed competitiveness at the asset level, where the analysis indicates that a number of Senegal's proposed LNG projects all have high breakeven prices that could threaten their viability if international prices fall (Figure 5). This is coupled with the projections that Senegal's discoveries will yield a relatively modest economic impact, contingent on favourable assumptions and prudent revenue management (IMF, 2023).

⁵ The domestic weighted average breakeven gas prices were calculated using Rystad Energy UCube data on asset-level breakeven gas prices, which were weighted based on their total forecasted production volumes. The sum product of each gas field's breakeven price and their associated forecasted production volumes divided by the total forecast domestic gas production yields the weighted average of breakeven gas prices for a given country. Note that data was not available for the GTA project in the Rystad Energy UCube database.



Figure 5. Breakeven gas prices for selected Senegalese gas assets



Source: IISD analysis based on Rystad UCube data. Note: only includes projects for which data was available under Senegal on Rystad UCube as of July 2024.

Revenues from gas production and LNG are captured by two main mechanisms. First, by payments made by the oil companies for taxes and royalties to the government, and second, by profits made by the state-owned oil company, Petrosen. Payments made to the government feed directly into the public budget without substantive restrictions on their use. The revenues retained by Petrosen may be used to further develop the oil and gas industry.

The fiscal regime for the Sangomar and GTA⁶ projects includes corporate income taxes of 33% and 25%, respectively (Davis & Mihalyi, 2021). The state also receives a share of the profit from production reported to be between 15% and 40% for Sangomar and 35% and 58% for GTA. This is reported to be relatively low by international standards (Davis & Mihalyi, 2021). As decarbonization accelerates, it is likely that governments will face pressure to offer tax breaks to oil and gas projects, and in doing so, reduce revenues collected. The more marginal projects will be worst hit by this pressure.

⁶ The analysis for Senegal excluded the GTA project as this was listed under Mauritania in the Rystad dataset that was used for this analysis. The GTA has a breakeven price of USD 4.78 on average.



Box 1. Mozambique LNG revenue projections are also similar

In 2018, the government of Mozambique published an estimate of revenues from LNG projects from four sources. First, a petroleum production tax, set at 2% and 3% of revenues for gas and condensate, respectively. Second, a “production bonus,” applicable only in the early years of the project and of limited value, as the project hits certain production milestones. Third, the government’s share of the profit from the projects, which makes up the bulk of expected revenue. Fourth, revenues may be collected in the form of corporate taxes. The government’s share of profit, due to its equity holding, ranges from 10% to 60%, depending on a formula that delivers more to the government if the project becomes more profitable. The structure of the mechanism means that government revenues are expected to be initially low and begin to ramp up in the early to mid-2030s. This is designed to allow the concessionaires to recover their investment over the initial years and means that the **potential economic benefit to the government and the people of Mozambique depends heavily on the international LNG market in the 2030s and beyond** (Halsey et al., 2023).

3.3 Economic Diversification Concerns

Energy development has been the key driver of Senegal’s economy. It aims to increase renewable energy to 40% of its total electricity mix by 2030, but has also included natural gas in its Just Energy Transition Investment Plan—a blueprint for the development of the energy transition in Senegal. Just Energy Transition Plan agreements are bilateral deals between groups of donor and recipient countries that aim to support the energy transition (IEA, 2024), balancing decarbonization with the need to supply energy for domestic purposes and in meeting its unconditional renewable targets under the national determined contribution (IEA, 2024). Domestic gas is often sold at subsidized rates, masking its true cost. Mature producers with internal pipeline networks can serve domestic markets, but utilization depends on infrastructure and anchor tenants. Challenges include balancing domestic demand with exports and commercializing enough reserves to maintain revenue streams. Some mature producers have observed some struggles with declining reserves and growing domestic demand impacting export revenues (African Climate Foundation, 2022). As a result, gas for domestic use is only feasible if economic benefits exist. Concurrently, Senegal has made commitments toward a just transition by preparing a new energy strategy for 2024–2028, focusing on securing low-cost energy supply, improving access to electricity and modern cooking fuels, and enhancing governance and regulation in the energy sector (IEA, 2024).



4.0 Risks of Scaling Up LNG Production

4.1 Risk 1: Much of the revenue from LNG may never reach the government budget

Substantial revenues from LNG production are a long way off.

Senegal's largest LNG project is only in its third year of development; project development and construction is estimated at 3 to 5 years post-FID decision, with revenue generation occurring after completion (PwC, 2014; Global Energy Monitor, 2022). The government, through Petrosen, will collect the generated revenue as taxes and royalties or retain it as profits (Davis et al., 2021). To fulfill its developmental mandate, Petrosen may divert its profits made from LNG projects toward further LNG infrastructure development rather than fund general government spending.

Generated revenue must also be balanced against the liabilities incurred.

The new Senegalese oil code, approved in 2019, introduces changes such as increased royalties, export tax, and higher state participation (Coulibaly & Arvanitis, 2020). The net impact on the public budget must consider the costs of state participation in LNG investment and any revenues received from royalties and charges. Given that all the investment costs happen before production starts and revenues only begin to slowly trickle in when the project is operational, the government is betting that Senegalese LNG projects will continue to operate profitably for decades to come. Reinvesting significant proportions of LNG revenues toward more LNG projects presents a risk of locking in the country's economy in fossil fuels. Dependency on fossil fuel-based income will further disadvantage Senegal when global energy demand and supply shifts from fossil fuel to clean energy alternatives.

4.2 Risk 2: Long-term export demand for gas from Senegal is uncertain

The period from discovery to production for an LNG project in sub-Saharan Africa is usually far longer than initial estimates.

A review of 12 projects in sub-Saharan Africa found that gas projects typically take 11.9 years to start production, compared to initial estimates of 8.1 years (Mihalyi & Davis, 2021). This shows that beyond the projects that are already in development, new discoveries cannot be expected to reach production before the mid-2030s. Therefore, an expansion of LNG, primarily driven by export revenues requires international demand to remain strong for decades ahead. As noted in Figure 3, credible scenarios including the IEA's Net Zero Emissions (Figure 6) and Stated Policies Scenario project a marked decline in natural gas supply in the 2030s.



Even if demand remains strong, Senegal must compete with other LNG producers.

As the data presented in Figures 4 and 5 show, breakeven prices are estimated to be higher for assets in Senegal than in many of the major LNG producers, including Qatar and the United States. This indicates that Senegal could be more exposed to a risk of low international prices⁷ than many of their global competitors. At the national level, some major projects are also particularly exposed to stranding if high prices fail to materialize (Figure 5).

Some of the future price risks cannot fully be offset by long-term offtake contracts.

LNG pricing and contracts have evolved from classical, oil-indexed long-term contracts to shorter-term contracts and spot selling (Yusuf et al., 2023). As of May 2024, only GTA Phase 1 was reported to have secured an offtake contract for a term of 20 years (Marquardt & Kachi, 2023). Offtake contracts do not guarantee revenues, they may have prices that are indexed to market prices and if conditions move unfavourably, offtakers may decide to accept penalty fees and end contracts.

4.3 Risk 3: LNG expansion may not sufficiently contribute to domestic energy security

The promise for domestic energy provision is uncertain.

One of the most tangible potential benefits of LNG expansion is that it could provide power to mitigate domestic energy needs, as indicated in Senegal's Just Transition Investment Plan. There are three barriers to this. First, gas for domestic consumption would require significant investment in additional pipeline infrastructure and power plant conversions (Power Engineering, 2019). There remain questions over the financial viability of this infrastructure and the timelines in which it can be constructed.

Second, the risk associated with a need to secure bankable counterparties to finance LNG infrastructure.

International financial institutions may prefer offtake agreements with established global energy players. This may be a cause to push for export deals to secure project capital investments, neglecting domestic production and supply in favour of international exports.

Third, a barrier to domestic use relates to the risk of asset stranding.

Domestic demand volumes may be a lot lower than the production from the Senegalese gas fields. In this case, domestic supply becomes subsidized by revenue from export markets, since projects are only viable when they can sell their entire production at favourable prices. Low international demand for LNG, which would be as a result of a decline in fossil fuel use in favour of renewables, could cause projects to cease operation. Without any revenue, such projects would not be able to operate, forcing the asset to be abandoned, whilst potentially endangering local LNG markets and energy security.

⁷ Refer to Figure 4 for breakeven price analysis.



5.0 Conclusions

Senegal stands at a critical juncture in its development trajectory, with the LNG industry poised to play a pivotal role in shaping its economic, social, and environmental landscape. However, amidst the promises of economic prosperity, LNG expansion poses multiple challenges, such as socio-economic impacts on coastal communities, environmental concerns, and the intricacies of revenue generation and economic diversification.

The socio-economic impacts of LNG development, particularly on vulnerable communities along the coastline, necessitate careful consideration of inclusive and sustainable development strategies. Moreover, Senegal's commitment to prioritize domestic energy needs underscores the urgency of addressing energy access challenges and avoiding pitfalls that could derail much needed improvements in energy access.

Concurrently, climate-related challenges, including rising sea levels and ecosystem degradation, demand proactive measures to minimize adverse impacts and promote environmental stewardship. Balancing economic imperatives with environmental sustainability is essential to foster long-term resilience and safeguard the country's natural heritage.

Looking ahead, Senegal's LNG growth prospects hinge on a complex landscape necessitating a balance between shifting global energy trends, fiscal challenges, and the imperative of economic diversification. While LNG projects may appear to hold promise for revenue generation and foreign investment, careful attention must be paid to whether, under likely demand and LNG price scenarios, they can deliver sustainable long-term returns. Additionally, efforts toward economic diversification beyond the energy sector are critical to reduce dependency risks and foster inclusive growth.



6.0 Recommendations

Re-evaluate LNG Development Driven by Global Demands

Given the uncertainty of revenues, government policy must consider a scenario in which revenues are negligible. This could occur due to excess capacity, a drop in demand, project delays, or successful lobbying efforts that reduce the government's share—most likely some combination of several of these factors. A strategy that relies on optimistic revenue estimates to fund borrowing and fiscal expenditures is extremely risky; whereas a strategy in which a high proportion of revenues are saved and used strategically has a lower risk to the economy.

Prioritize Clean Energy Development

Prioritize investments in renewable energy infrastructure and promote energy efficiency measures to reduce reliance on fossil fuels and mitigate climate change impacts. Domestic renewable energy production doesn't face the risks listed in this document. Align fiscal policies and incentives with sustainability objectives to incentivize responsible investment in clean energy and promote a just transition to a low-carbon economy.

Revenues Should be Strategically Spent to Develop the Domestic Economy

To avoid simply using LNG revenues for day-to-day fiscal spending, a portion of revenues should be diverted toward funding “strategic” priorities, either by supporting the existing sovereign wealth fund (Fonds Souverain d'Investissements Stratégiques) that may be repurposed for this task, or by earmarking funds for capital investments that are designed to bring long-term benefits to Senegal. The governance of these funds is still under discussion.

Minimize Environmental and Socio-economic Risks

Senegal can prioritize comprehensive community engagement processes and conduct thorough social impact assessments before and during LNG project development. This includes actively involving local communities in decision-making processes, addressing their concerns, and ensuring equitable distribution of benefits. Implementing community development initiatives and livelihood support programs can mitigate adverse socio-economic impacts, particularly for vulnerable groups.

Diversify Revenue Streams

Recognize the inherent volatility of fossil fuel markets and diversify revenue streams to reduce dependency risks. Invest in alternative sectors, such as renewable energy, agriculture, tourism, and manufacturing, to foster economic diversification and resilience. Promote innovation and entrepreneurship to unlock new opportunities for sustainable economic growth and job creation.



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