



GHANA
UPSTREAM
PETROLEUM
CHAMBER



AN OVERVIEW OF GHANA'S GAS SECTOR

A Position Paper on Supply, Demand & the Way Forward

April 2021



Prioritising our Domestic Gas for National Development

This is a current report on Ghana's natural gas industry. We want to contribute to an increased understanding of the industry, and build support for it.

The Chambers position papers identify issues we are all concerned about but often struggle with, in our quest to gain an understanding of the best options available to us.

I hope you find this paper useful, both as a frame of reference and as a tool to help inform the development of effective policy for the industry.



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CEO, Ghana Upstream Petroleum Chamber



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ABBREVIATIONS

BBLs	Barrel of Oil
CAPEX	Capital Expenditure
ESRP	Energy Sector Recovery Program
FSRU	Floating Storage Re-gasification Unit
GMP	Gas Master Plan
GNGC	Ghana National Gas Company
GNPC	Ghana National Petroleum Company
GoG	Government of Ghana
IOC	International Oil Company
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
MMBOE	Million Barrels of Oil Equivalent
MoE	Ministry of Energy
MoF	Ministry of Finance
MW/d	Megawatt per day
OCTP	Offshore Cape Three Points
OPEX	Operating Expenditure
PIAC	The Public Interest Accountability Committee
SCF/d	Standard Cubic Feet Per Day
TEN	Tweneboa Enyenra Ntomme Oil Field
TTIP	Takoradi - Tema Interconnection Project
WAPCO	West African Gas Pipeline Company



EXECUTIVE SUMMARY

The production, supply and the utilisation of Ghana's domestic gas continues to play an essential role in the country's economic development. These domestic gas resources have the potential to significantly change the fuel supply dynamics over the next 15 to 20 years and safeguard the country's future energy needs.

This paper is intended to layout the important positioning of gas production, delivery and use in terms of an overarching energy policy that matches the needs of Ghana whilst ensuring that the development of hydrocarbon production is encouraged to ultimately deliver the maximum economic benefit to the state. Presently, Ghana is producing gas from three fields – Jubilee, TEN, and OCTP Sankofa. OCTP Sankofa's reliable gas supply at the moment is 210mmscf/d while Jubilee together with TEN exports is 120mmscf/d with the scope for greater domestic production in the coming years.

Since two of the three production hubs are primarily oil based with associated gas production, an enabling gas policy cannot be considered in isolation. Limitations on gas production, in that environment, do have a consequential impact on future oil production and as such reduce the economic value to the state. In the current environment, there are only three possible routes to evacuate gas, i.e. delivery to shore, re-inject or flare. Flaring is by far the least attractive option both in terms of economic value, environmental impact and reputational damage. Re-injection is a complex issue and impacts on the ultimate performance of the reservoir and thus the economics of any development. Export of gas is therefore the best option to maximise returns but predicated on policy designed to avoid constrained oil and gas production within Ghana.

This suggests that government's determination to utilise cheaper, domestic natural gas to promote power, transport, fertiliser production, and a petroleum hub can be undermined if LNG imports are introduced to constrain and hamper domestic gas evacuation. In essence, reviewing the impact of LNG within the broad integrated energy policy framework and its limiting impact on the advancement of domestic gas production is key to future offshore developments and sustained revenue to the state.

This high-level study provides an overview of Ghana's gas sector and addresses the existing challenges and opportunities in the sector.



Key Findings

1. A potential excess of gas in the domestic market over the next 5 years if LNG is supplied into the domestic market above and beyond the current available gas production capacity;
2. A potential loss in market share for domestic gas producers, suppresses and discourages domestic and foreign investment, and the development of domestic resources;
3. The absence of an over-arching policy framework driving the development of Ghana's gas sector combined with often fragmented policy directives and communication, presents IOCs with an ever-increasing challenge of how to plan and forecast in light of the uncertainties;
4. Lack of adequate infrastructure available for domestic utilisation of gas and potential evacuation of excess gas. The Takoradi - Tema Interconnection Project (TTIP, completed in 2019) allows a reverse flow of gas from Aboadze to the Tema power enclave and is the only existing pipeline enabling supply of gas from where it is produced in the west to the power market in the east;
5. The importation of gas from Nigeria as well as LNG means significant gas will be left stranded in the domestic gas fields;
6. Reducing gas supply from Jubilee, TEN and OCTP Sankofa would limit revenue streams for both GoG and IOC's;
7. There are on-going discussions amongst stakeholders questioning the possibility of LNG being exported from Ghana to the sub-region. However, there is no clarity on how this will be achieved;
8. The policy considerations surrounding the Tema LNG project appear to have assumed pre-eminence over the available data which suggests that there is enough supply of domestic gas to meet local demand;
9. There is an apparent lack of information regarding the cost and benefit analysis conducted on LNG imports to Ghana with consideration to price predictions and forecasts on LNG.



Recommendations

1. GoG should be clear on its national gas needs so the existing gas producers can ensure the required certainty of supply availability;
2. Key stakeholders should develop a public relations campaign to educate and inform the general populace on gas, paying particular attention to influencers and the decision-makers who matter on both sides of the political divide;
3. Both GoG and IOC's should explore additional evacuation avenues for existing domestic gas resources including the associated and undeveloped gas discoveries;
4. GoG should prioritise and optimise the utilisation of domestic gas as key drivers of Ghana's gas to power plan;
5. GoG should develop a policy framework and update its Gas Master Plan together with stakeholders to incentivise continued investments in domestic gas resources and provide opportunities as well as upgrade and develop infrastructure to maximise the use of local gas for domestic needs and export the excess gas to neighbouring countries;
6. GoG should maximise local gas off-take and utilise existing contractual mechanisms for optimal domestic gas utilisation to minimise the financial loss on gas trade and additionally benefit from associated liquids production;
7. GoG should explore opportunities for value creation in the country along the entire value chain, creating appeal for foreign investment, leveraging energy independency, operational and cost stability and job creation;
8. GoG should consider engaging in a multi-sectoral, coordinated effort to stimulate demand for non-power uses of gas such as fertiliser development;
9. GoG should consider the use of imported LNG as a 'top-up' in the case of insufficient domestic supply;
10. GoG and IOC's should consider engaging all stakeholders in an open dialogue on issues surrounding the gas aggregator;
11. GoG should consider carrying out a thorough cost/benefit analysis on LNG imports to Ghana with consideration to price predictions and forecasts on LNG.



1.0 INTRODUCTION

This paper provides an overview of the gas segment of the oil and gas sector in Ghana. It has been developed as a result of the following concerns raised by international oil companies (IOCs) who constitute members of the Chamber:

1. What is the overview of the Ghana Gas sector?
2. What is the status of supply-demand of gas in-country?
3. What is the difference between supply and total demand and how might the importation of liquefied natural gas (LNG) affect this?
4. Is there an overall gas strategy?
5. What are the implications for key stakeholders?
6. What recommendations can be made to enhance the gas sector?

The paper seeks to highlight specific areas that could be a focus for further engagement and advocacy, both collectively by the Ghana Upstream Petroleum Chamber on behalf of the IOCs and by the IOCs themselves. The authors of the report have dialogued extensively with a cross-section of key stakeholders within Ghana's oil and gas sector, including state agencies, policy and decision-makers, and international oil and gas companies.

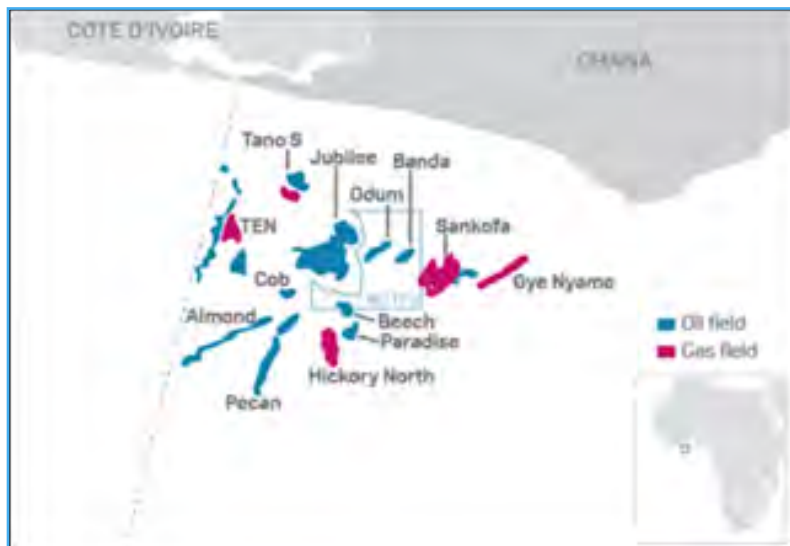


2.0 THE GAS OVERVIEW

I. Gas Production and Distribution

Ghana is currently producing gas from three fields – Jubilee, TEN, and OCTP Sankofa with the scope for greater domestic production in the years ahead from yet to be developed gas fields. Figure 1 below shows the significant oil and gas fields in Ghana. It is estimated that Ghana has between 1.5 Tcf and 1.7 Tcf of gas reserves. These estimates also include reserves, which have not been discovered yet. Majority of these resources have not been included in any new project and are still subject to further appraisal and evaluation. Jubilee and TEN are primarily oil based where associated gas is partially produced, while OCTP Sankofa is an integrated project where non-associated gas is produced for domestic utilisation. It is also important to take note of the yet to be developed Pecan field by Aker which is situated 166km to the south-west of Takoradi. Estimated to contain up to 334 million barrels of oil-equivalent, the Pecan field represents the biggest discovery in the deep-water Tano Three Points (DWT/TP) block within the Tano Basin. Total resources in the area have the potential to increase to between 600-1000 mmboe, provided successful appraisal drilling activity is carried out. With plateau production estimated at 110,000 barrels of oil per day, the Pecan field could add a significant amount of gas to the volumes of domestically produced gas.

Figure 1: Oil and Gas fields in Ghana.



Source: S&P Global

The 2020 daily average domestic gas supplied from combined Jubilee and TEN was 86mmscfd, OCTP Sankofa was 156mmscfd and N-Gas was 65mmscfd. The design production capacities for these facilities are; OCTP Sankofa (300mmscf/d), Jubilee (190mmscf/d), TEN (180mmscf/d) and N-Gas (120mmscf/d).



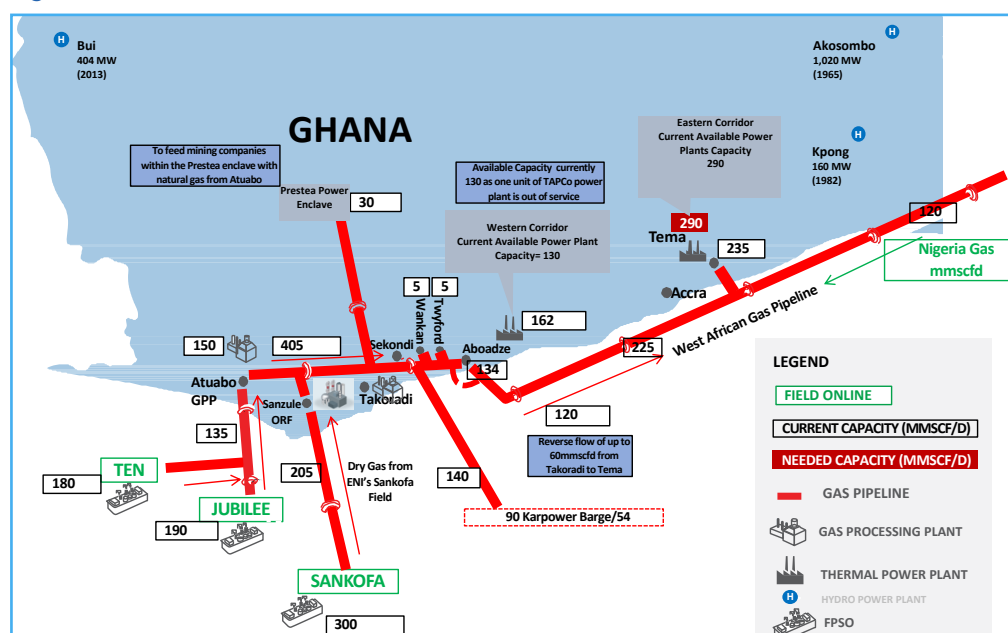
The completion of the reverse flow to allow the evacuation of gas from Takoradi to Tema paved the way for the smooth flow of gas from the Aboadze power enclave for use by the various gas off-takers in the Tema-Accra enclave. The key design capacities of the 3 TTIP sites are:

GNGC Takoradi capacity	–	405MMSCFD
WAPCO Takoradi	–	225MMSCFD
WAPCO Tema plant size	–	235MMSCFD and expandable to 345MMSCFD (TTIP base scope).

To address the imbalance of gas supply between the West and East of Ghana, the Karpowership barge (450MW) was moved from its previous location in Tema to the Sekondi Naval Base and converted to run on domestic gas.

Imported natural gas arrived in Ghana from Nigeria via the West African Gas Pipeline (WAPCO) towards the end of 2008¹. Initial transporting volumes were small until contractual commitments were met in 2011. Supply, however, has been erratic but with the introduction of domestic gas from Ghana's domestic fields, the country secured long awaited reliability in gas supply for power generation. Nonetheless, Ghana has contracted supplies of LNG scheduled for arrival by April 2021. Figure 2 below shows the gas production and distribution networks in Ghana.

Figure 2: Gas Production and Distribution in Ghana



Source: Information gathered from discussions with gas producers and ESRP 2019

¹ Future Prospects of LNG Demand in Ghana: <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2018/01/Future-prospects-for-LNG-demand-in-Ghana-Insight-26.pdf>



II. Gas Demand and Supply Imbalance

Demand

In 2020 and 2021, the Ministry of Energy (MoE) estimated that 285mmscf/d and 350mmscf/d respectively would be the average daily demand for gas, from the following sources.

Table 1: Source and Gas Demand Average

Source	Gas Demand (mmscf/d)	
	2020	2021
Jubilee/TEN	125	125
Sankofa	130	180
WAGP	30	50
Total	285	355

Source: Ministry of Energy 2021

Gas received has been generally utilised for electricity generation as it is the primary driver of gas demand and LPG supplier in Ghana. Demand for electricity is as a result of the population—currently estimated at 30 million, its growth—estimated at approximately 3% per annum, urbanisation, rising living standards, and energy intensity per capita. The average demand for power in Ghana is around 2,700MW/d with a substantial amount being generated by two main sources: hydro - Akosombo, and Bui dams (35-40%) and Thermal (60-65%)².

Also, there are additional benefits such as condensate production from the associated gas fields that go to Ghana National Gas Company Ltd (GNGC) for local and municipal consumption. Currently, the condensate from the Atuabo plant is transported to the Tema Oil Refinery (TOR), where it is processed to yield petroleum products like propane, butane and gasoline. According to the Public Interest Accountability Committee³ (PIAC, 2020), the volume of condensates sold from January to June, 2020 was 10,429.43MT while that for the same period in 2019 was 9,430.47MT. This translated into an increase of 998.99MT, representing a 10.59 percent increase. Also, the realised revenue from the half year sale of condensates for 2019 was US\$2,384,595.65, while 2020 revenue for same period was US\$1,229,199.47, mainly due to the effect of Covid-19 and its associated effect on crude prices on the world market. It is estimated that about 40% of LPG distributed in Ghana comes from the Jubilee/TEN fields through GNGC.

² The Government of Ghana, 2020 Electricity Supply Plan

³ Public Interest Accountability Committee (PIAC, 2020). PIAC 2020 Semi-Annual Report: https://www.piacghana.org/portal/files/downloads/piac_reports/piac_2020_semi-annual_report.pdf



Supply

Ghana's gas supply comes from the following sources: domestic supply (Jubilee, TEN, OCTP Sankofa) and imported gas from Nigeria via the West Africa Gas Pipeline (WAPCO). The table below provides the estimated volumes each source is capable of producing and compares it with the average daily volumes off-taken by the aggregator (GNPC/GNGC) in 2020.

Table 2: Gas Supply and Export

Source	Capacity (mmscf/d)	2020 Av. Export (mmscf/d)
Domestic Gas Production		
Jubilee	190	70
TEN	180	15
OCTPSankofa	300*	155
Imports		
Nigeria (WAPCO)	120	60
Tema LNG	200	0

Source: IOC, 2021

*260mmscf/d can be made available with little modification and potentially further increased to 300mmscf/d.

The total production design capacity of locally sourced gas and gas from Nigeria is approximately 790 mmscf/d. The gas demand projection for 2021 is estimated at 355mmscf/d. There is therefore an excess of approximately 435 mmscf/d of gas — more than adequate to power a significant amount of Ghana's total installed generating capacity for the foreseeable future.

Analysis of production reports taken from the last two quarters of 2020 (see Table 3 below), confirm the average amount of gas off-taken by the aggregator was less than 300 mmscf/d. The Government of Ghana is therefore, currently not able to utilise to the fullest extent all of the gas produced domestically and presently, there remains an excess supply of gas in the domestic market.

Table 3: Gas Supply and Export

Month	TEN			JUBILEE			OCTP SANKOFA			
	Oil (bbls)	Gas Production (mmscf)	Export Gas (mmscf)	Oil (bbls)	Gas Production (mmscf)	Export Gas (mmscf)	Oil (bbls)	Gas Production (mmscf)		Export Gas (bbls)
								Associated Gas	Non-Associated Gas	
June	1,465,613.40	472,370	697.4	2,724,904.00	563,444.06	2,648.21	1,483,483	354,320	5,901	4,792
July	1,479,588.20	474,750	573.5	2,757,447.00	583,619.25	2,715.47	1,471,793	357,170	5,915	4,637
Aug	1,563,283.90	491,160	444.7	2,790,002.00	577,109.63	2,924.95	1,590,074	375,320	4,949	3,785
Sep	1,516,707.10	544,760	853.7	2,523,194.00	538,792.91	2,017.15	1,512,338	405,320	4,949	3,751
Oct	1,425,111.00	532,290	360.1	2,468,421.00	544,257.1	3,006.99	1,562,968	428,520	5,830	4,827
Nov	1,288,217.00	513,220	305.7	2,275,389.00	538,376.16	3,041.81	1,483,176	414,360	5,485	4,576

Source: IOCs, 2021

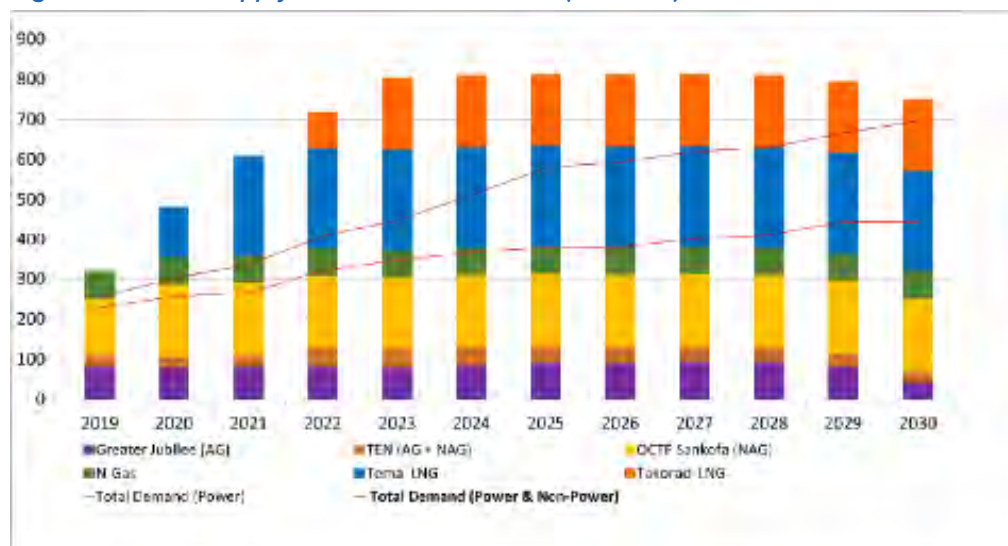


III. Projections

According to the Ghana Energy Sector Recovery Program (ESRP, 2019)⁴, based on the most probable electricity demand projections available, there is no need for new additional generation capacity until 2027. It is suggested that an additional generation capacity prior to 2027 is only warranted if the total cost of a new generation plant is less than the marginal generation (energy) cost of existing plants. Thus, any new plant built before 2027 must be cheap enough to bring down the total cost of generation. Meanwhile, the present non-residential tariff structure does not provide an incentive for higher consumption for productive uses coupled with the downward review of Ghana's economic outlook due to the COVID 19 pandemic.

Figure 3 shows that demand for gas for power would exceed supply from 2027. However, combined power and non-power gas demand could exceed supply in 2022 in the event of a booming economy with an increased power and non-power demand for gas. Due to the COVID-19 pandemic and the downward review of Ghana's economic outlook it is uncertain if this increase in gas demand can be attained. Also, the shortfall in 2023, is relatively small and could be accommodated by changing the delivery profile of available supply (ESRP 2019). Adjusting production at domestic gas fields can be used to respond to unexpected supply losses once current infrastructure constraints are removed. Besides, the Nigerian gas through the West African Gas Pipeline would be a flexible source of supply.

Figure 3: Ghana Supply and Demand Balance (mmscf/d)



Source: Ghana Energy Sector Recovery Program 2019

The recent downturn of economic developments coupled with the impact of COVID 19, would require some necessary growth impetus with a critical cost and benefit analysis before importing LNG into the country. According to the World Bank projection released in April 2020, the Ghanaian economy is

⁴ The Ghana Energy Sector Recovery Program: 2019 http://energycom.gov.gh/files/2019%201111%20ESRP%20ESTF_Clean_v3.0redacted%20final.pdf



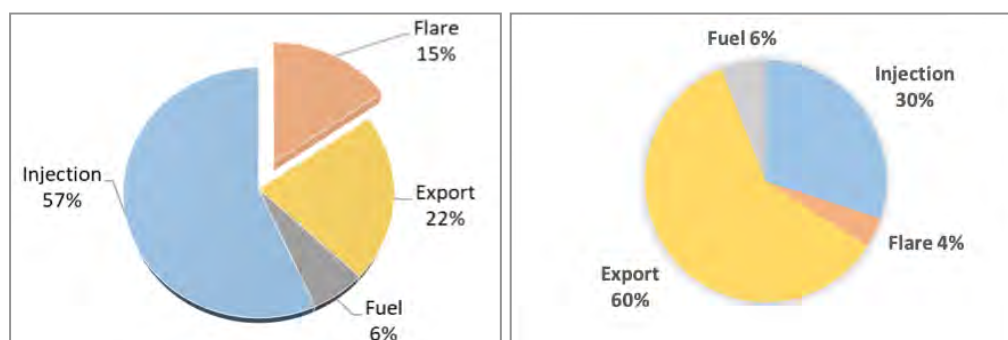
expected to grow by only 2.5%, down from the initial forecast of 6.8%. The IMF in its latest release (April 2020) also reviewed its projected growth of the economy downwards to 1.5% from its December 2019 estimate of 5.8%. The Ministry of Finance also reviewed downward the projected growth of the economy to 0.9% (1.6% non-oil) in the 2020 mid-year budget review. Growth is expected to remain low even after the COVID-19 crisis, as oil production slows further due to maintenance and natural decline. Nonetheless, government needs to ensure that the natural gas supply equals demand to avoid unnecessary payments for excess supply.

IV. Associated Gas Management Constraints

In the current environment, there are only three possible routes to evacuate associated gas, i.e. re-inject, delivery to shore or flare. Flaring is by far the least attractive option both in terms of economic value, environmental impact and reputational damage. Re-injection is a complex issue and impacts on the ultimate performance of the reservoir and thus the economics of any development. Delivery to shore of associated gas is therefore the best option to maximise returns but predicated on policy designed to avoid constrained oil and gas production within Ghana.

The historic constraints of gas delivery to shore from the associated gas fields have been the result of several challenges such as facility downtime and variability in demand, suspected export line blockage and recent export line vibrations. Despite the fact that different fields would need different gas injection to support reservoir pressures, a more generalised percentage of produced gas utilisation for the associated gas fields have been (as indicated in figure 4): Re-injected (57%), Export (22%), Flare (15%), and Fuel (6%). However, in order to ensure long term and sustained high gas export from these associated fields and to prevent the loss of reserves, at least 60% of gas should be exported and at most 30% injected for optimal reservoir support and oil production.

Figure 4: Gas Utilisation and Preferred



Source: IOCs

Also, in this era where carbon neutrality and net zero emissions are gradually becoming strategic operational goals, a focus on gas off-take could eliminate any flaring-to-produce aspirations.



3.0 UNCERTAIN POLICY FRAMEWORK

Fragmented Gas Policy

Despite the existence of the 2016 Gas Master Plan (GMP), initiated and implemented between 2012-2016 as a result of broad institutional and stakeholder consultation, the policy surrounding the gas industry has been largely unsettled. There are a number of strategic policy documents that exist alongside each other, often with contradictory elements- The National Energy Policy (2010); Gas Action Plan (2014); Integrated Power System Master Plan (2018); Electricity Supply Plan (2019, 2020); to name a few.

The infrastructure, financial commitment and long life cycle nature of the gas industry requires a settled policy framework to encourage and maintain investments. For national and international participants with a long-term view of investing in Ghana, the uncertainties surrounding the policy environment are concerning; particularly as it seems to lack continuity across political administrations. The various IOC counter-parties are therefore increasingly presented with an uncertain national policy framework against which, to make their strategic investment decisions, which has been further compounded by the impact of the COVID-19 pandemic on the global energy industry. The following areas provide further examples of where the policy framework has been unstable and often contradictory.

Position of the Gas Aggregator

Ghana National Gas Company (GNGC) was established in 2011. During the 2015 budget reading, the Ministry of Finance announced an internal merger, with Ghana Gas being subsumed into Ghana National Petroleum Company (GNPC), with a number of reasons adduced for this decision. In 2020, the Ministry of Finance supported and facilitated the de-coupling of Ghana Gas from GNPC. This latest transformation appears to be substantive as it involves the replacement of gas sales agreements previously entered into by GNPC with the IOCs, the substitution of GNPC for Ghana Gas as an aggregator for the local market, and the establishment of Ghana Gas as an integrated gas company.

The proposal to make Ghana Gas the gas aggregator appears to contradict the government's own policy framework on the matter, as outlined in the country's 2016 Gas Master Plan (GMP)⁵. According to the GMP, the decision to appoint GNPC as the aggregator of gas, while making Ghana Gas a fully owned subsidiary of GNPC, sought to "improve coordination in the sector and facilitate infrastructure investment and financing." The recent decision to make Ghana Gas an independent, integrated gas company raises a number of complex questions therefore, including how an evolving gas sector and a new aggregator can overcome the fundamental difficulties of technical human resource capacity and credit-worthiness to guarantee gas contracts and to

⁵ The Government of Ghana's Gas Master Plan, Ministry of Petroleum, June 2016



provide a conducive environment for future infrastructure investment both for existing and prospective IOCs. There is however the counter argument that Ghana Gas may be better suited for the role of the aggregator.

Either way, the aggregation model the government would want to apply should be tailored specifically to reflect the regulatory needs of the gas sector, with careful consideration of the regulatory and economic objectives that such aggregation intends to secure. Its consistency with world industry models is key. A single comprehensive Gas Master Plan with a clearly defined aggregator role and demand and supply profile could improve coordination and facilitate infrastructure investment and financing.

Sudden Entrant - Tema Liquefied Natural Gas Project

The Tema liquefied natural gas (LNG) project has been commissioned by government and has reached a significant milestone with the delivery of the floating storage regasification unit (FSRU). Consequently, these developments have raised a number of questions on behalf of existing producers operating within Ghana's oil and gas industry due its potential to destabilise the supply network from current and future producers. Moreover, the importation of LNG at this time, appears to suggest that the policy shift in favour of LNG imports could be to the disadvantage of developing existing domestic oil and gas fields and to the domestic gas market more broadly. Table 4 below provides the estimated volumes of LNG imports expected over the lifespan of the project. The gas volumes will be introduced gradually, rising incrementally until the full 200mmscf/d capacity is reached.

Table 4: LNG Volumes and Imports

LNG Volumes (mmscf/d)	Year of Imports
75mmscf/d	2021
125mmscf/d	2022
150mmscf/d	2023
175mmscf/d	2024
200mmscf/d	2025 and beyond (up to year 12)

Source: GNPC, 2021

A number of internally generated reports involving a range of demand projections, have often been used as a basis to justify the development of expensive infrastructure in Tema, to facilitate the importation of LNG. These demand projections have not always been based upon reliable, consistent and interconnected data. Stakeholders have observed that figures may vary depending on the government agency from which they have originated.



4.0 The Way Forward

The prevailing view is that LNG imports appear to be entering the market at a time when there is enough supply to meet local demand. In a scenario where there may not be an immediate uptake of LNG from the Tema industrial enclave, this could lead to an over-supply of gas—a situation which could remain for the short-term and which could be exacerbated further by the discovery and appraisal of new oil and gas fields within the next 3-5 years.

It has been suggested that in order to circumvent such a scenario, GoG may be faced with the possibility of:

I. Reducing volumes of gas off-take from Jubilee and TEN:

- This may seem economically counter-productive since the foundation gas from Jubilee is currently free;
- This will further increase the amount of unutilised gas; and a consequential increase in flaring and the negative impact on the carbon footprint of both the operators and Ghana;
- This will reduce gas supply and may have an adverse impact on the IOC's and GoG's oil revenue expectations since oil production from these fields has a dependency on gas production and management;
- This will reduce the off-take of gas and could increase the rate of re-injection or flaring beyond what is considered optimal for oil production, which could adversely impact the integrity of the reservoirs and wells.

II. Reducing volumes of gas off-take from OCTP Sankofa:

- This will further increase the amount of unutilised gas;
- This will increase the financial burden on GoG to meet the additional financial obligations accrued from LNG and may impact further on its ability to meet its existing financial commitments to the operator and partners;
- This will result in further accumulation of makeup gas (the gas paid for under a take or pay condition but not off-taken), which the buyer has the right to off-take by taking more gas above the contractual quantities;
- This reduction in gas off-take will have a negative impact on liquids output and revenue reductions for both IOCs and GoG.

5.0 Recommendations

The following recommendations have therefore been developed for the IOCs and the Government of Ghana (GoG):



6.0 Keep in View

- Discussions surrounding Ghana becoming a petroleum hub with plans to export gas, including imported LNG;
- Additional benefits such as condensate, liquids and LPG yield. It is estimated that about 40% of LPG distributed in Ghana comes from these domestic gas fields;
- How LNG fits into the strategic campaign to attract more associated and non-associated gas exploration investments. This is a big disincentive to domestic gas investments.



REFERENCES

- *The Government of Ghana (2020). Electricity Supply Plan for Ghana. An Outlook of the Power Supply Situation for 2020 and Highlights of Medium Term Power Requirements.* https://www.gridcogh.com/wp-content/uploads/2020/04/2020_Electricity_Supply_Plan.pdf
- *Public Interest Accountability Committee (PIAC, 2020). Semi-Annual Report: Report On the Management and Use of Petroleum Revenues for the Period January –June 2020*
- https://www.piacghana.org/portal/files/downloads/piac_reports/piac_2020_semi-annual_report.pdf
- *Ministry of Energy (2019). The Ghana Energy Sector Recovery Program.* http://energycom.gov.gh/files/2019%201111%20ESRP%20ESTF_Clean_v3.0redacted%20final.pdf
- *Mike Fulwood & Thierry Bros (2018). Future Prospects of LNG Demand in Ghana:* <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2018/01/Future-prospects-for-LNG-demand-in-Ghana-Insight-26.pdf>

NOTES

A large offshore oil rig is illuminated at night, with its lights reflecting on the dark blue water. A tall derrick stands prominently next to the main platform. In the background, another smaller rig is visible on the horizon under a twilight sky.

The Ghana Upstream Petroleum Chamber is the umbrella organisation for the upstream oil and gas industry in Ghana. For more information, visit www.ghanaupstream.com.



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