

Ghana National Petroleum Corporation

THE UPSTREAM PETROLEUM INDUSTRY IN GHANA -
OIL AND GAS EXPLORATION DEVELOPMENT AND PRODUCTION

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INTRODUCTION

The recent discovery of significant oil and gas accumulation in the territorial waters of Ghana, offshore Western Region by Kosmos Energy Ghana HC (Kosmos) and Tullow Ghana Limited (Tullow), has generated a lot of public interest and discussion. The two discoveries which were made in deep sea are about 65 km from the nearest coastal town of Effasu.

Frequently asked questions are:

1. What is the extent of the reserves?
2. Has there been any legal and regulatory framework?
3. Are we now going to negotiate on the sharing of the resources?
4. What are the benefits that will accrue to Ghana?
5. What will be the implications of the exploitation of the resource on the environment?
6. Will the exploitation be a “blessing or a curse?”
7. Does Ghana have the capacity to monitor the operations of the oil companies and ensure Ghana derives maximum benefits from its oil resources?
8. Is there the possibility of further discoveries?
9. When will development and production commence and when can Ghana expect its first oil?

The Ghana National Petroleum Corporation (GNPC) will provide answers to these questions through a series of publications to be made.

GNPC deems it a duty to come out and educate the public and to provide information on the operations of the upstream petroleum industry in Ghana.

THE UPSTREAM PETROLEUM INDUSTRY

The Upstream Petroleum Industry involves Exploration, Development and Production. On the other hand, the Downstream refers to the refining/processing and distribution of petroleum products.

Petroleum (oil and gas), which is sometimes referred to as Hydrocarbons, is made up mainly of chains of hydrogen and carbon molecules formed from dead organisms, which have been buried with sediments to great depths.

At such depths, high temperature and pressure conditions transform the organic matter into giant molecules known as kerogens. Hydrocarbons then emerge from these kerogens, migrate and accumulate in commercial quantities in certain subsurface geological features called traps. These traps, which can be seen in seismic sections, become the targets for exploration and development.

Hydrocarbons exist in gaseous, liquid and semi-solid forms. They occur in sedimentary basins found on land and under the sea.

USES

Petroleum has numerous uses in the manufacturing industry, in transportation, road construction and in the home.

In the industry, petroleum products are used in some chemical processes to produce plastics.

Wax, used in the packaging of frozen foods and package blocks, is a petroleum product.

Sulfuric acid, which is a byproduct of sulfur removal from petroleum, is a useful industrial chemical.

Tar is another petroleum product that is used in the treatment of skin diseases (psoriasis), an anti-dandruff agent in shampoo and as a component in cosmetics. Tar also has many other uses, as paint additive and seal for roofing and ship hulls.

Petroleum coke, another product is used in specialty carbon products such as certain types of electrodes.

In the Petrochemical Industry, petrochemical feed stocks are used in various ways to produce polymers used in the manufacture of elastomer (rubber), fibre, gel or lubricants and many other products including fertilizer.

In transportation, power plants and in heating; petroleum is used in the form of diesel fuel, fuel oils, petrol (gasoline), jet fuel, kerosene, liquid petroleum gas (LPG) and natural gas (NG).

Asphalt is a sticky, black and highly viscous liquid or semi-solid petroleum product used as a glue or binder of aggregate particles and very useful in road construction.

In the homes; petroleum products are used in cooking (LPG) and in heating (NG) during winter. Petroleum production in an economy therefore brings along numerous industries with their attendant benefits to that economy.

FRAMEWORK FOR MANAGING UPSTREAM PETROLEUM INDUSTRY IN GHANA

The framework for managing the upstream petroleum industry in Ghana is established and given legal backing by two main statutes, PNDC Law 64 and the Petroleum Exploration and Production Law, PNDC Law 84, supplemented by the Petroleum Income Tax Law, PNDC Law 188 of 1987.

PNDC Law 64 established the Ghana National Petroleum Corporation and made it responsible for managing the petroleum resources in Ghana. The Law, in the main, spells out the organizational structure, the objects and modus operandi of GNPC. The supervising Ministry of the activities of GNPC is the Ministry of Energy.

The Petroleum Exploration and Production Law (PNDC Law 84) provides the framework for the management of oil and gas exploration, development and production. The Law establishes the contractual relationship between the State, GNPC and the prospective investor in the upstream operations.

It defines the basic terms and conditions of any Petroleum Agreement, spelling out the rights and obligations of each party with appropriate sanctions.

Flowing from the Laws is the Model Petroleum Agreement which is used as the basis for drawing up a final Agreement which is negotiated and executed with an investor. This final Agreement will specify the following:

1. The area that has been applied for and awarded;
2. Exploration Period and the related Work Programme, Cost of the Work Programme, and Sanctions in case of default;

3. Benefits: Clearly defined benefits to be derived by the State which in the case of Ghana is through the Royalty Tax System:

- Rate of Royalty
- Carried Interest
- Additional Interest
- Additional Oil Entitlement (AOE)
- Income Tax
- Annual Surface Rentals

The investor's portions of benefits are also stated and conditions under which they are defined are clearly stated.

MONITORING OF OPERATIONS

The Petroleum Agreement empowers GNPC to effectively monitor the operations of the oil company and apply sanctions through the Minister for Energy.

The monitoring is done through a Joint Management Committee (JMC) which is established by the Petroleum Agreement, comprising equal number of representatives from GNPC and Investor and chaired by GNPC. GNPC is empowered to review the work programme of Investor and audit the cost of operations, audit procurement processes of Investor, audit employment contracts made by Investor and has the power to approve, reject or ask for modification.

The Law empowers GNPC to attach its officers to operations during all phases of operations.

Similarly, the Law provides for GNPC to arrange for Customs officers on the production facilities and production platforms to monitor metering and production operations to verify quantities of oil and gas produced and lifted. Before any oil is lifted and sold from the facilities, the Customs officers will have to certify the quantity and quality of crude.

RELINQUISHMENT

The Law also provides that Investor relinquish periodically, areas of the awarded block that it is not working on.

DECOMMISSIONING

The Law makes it Investor's obligation to reclaim the area of operations after he has finished operations.

PROCEDURES FOR OBTAINING AN EXPLORATION BLOCK IN GHANA

GNPC has conducted comprehensive evaluation of the oil and gas potential of all our sedimentary basins and packaged the potential which is promoted to the international oil and gas industry. This is done through presentations at various international oil and gas conferences, industry exhibitions and other forums. Interested investors visit GNPC for further data review and discussions. An application form is then completed and submitted to the Minister for Energy who then refers it to GNPC for evaluation and due diligence on the Company involved.

GNPC then conducts the evaluation using the following criteria, that is, Financial Capability, Technical Track Record, Proposed Work Programme and Budget, and Proposed Fiscal Package. The work programme and the fiscal package are the two critical items for negotiations. In addition to these, GNPC conducts due diligence on the Company to satisfy itself that it is duly incorporated as a corporate entity and it is free to conduct petroleum operations. GNPC further examines the competences of the investor's management and key technical personnel.

A comprehensive report, including the Board's recommendation, is then submitted to the Minister for Energy.

If the Company is acceptable in accordance with the set criteria, the Minister constitutes a Petroleum Agreement negotiation team to negotiate with the Company.

The team includes senior officials from:

1. Ministry of Energy;
2. Ghana National Petroleum Corporation;
3. Attorney-General's Department; and
4. Internal Revenue Service.

The negotiated draft Petroleum Agreement is submitted to the Minister for Energy who forwards it to Cabinet for approval.

If Cabinet approval is given, the Agreement is then forwarded to Parliament for consideration, modification where necessary and ratification.

GNPC appears before the Parliamentary Select Committee for Mines and Energy to defend the Agreement and clarify provisions or terms that might be questioned. It is only when parliamentary ratification is secured that the Petroleum Agreement becomes effective and barring any other conditions precedent, it gives the investor the licence to commence operations.

Companies without strong financial capabilities are required to post performance bonds or provide bank guarantees to cover the risk of the company's inability to discharge agreed work programmes.

All companies operating in Ghana are doing so within the framework of a negotiated Petroleum Agreement that has gone through this process.

BENEFITS TO THE STATE FROM EXPLOITATION OF ITS PETROLEUM RESOURCES

The benefits accruing to the State from any petroleum exploration and production venture is predetermined in the Petroleum Agreement and approved by Cabinet and ratified by parliament before the commencement of the exploration activity. Because of the risky nature of exploration and the fact that a venture could fail to result in a discovery, the parties always, and in line with international practice, negotiate how cost will be recovered and profits shared in case of a discovery and have the terms incorporated in the Petroleum Agreement. If there is no discovery, Investor bears his cost without recourse to the State.

Again, because of the risky nature of the exploration and production business and the State's desire to avoid high exposure in petroleum exploration and production activity, it has adopted the Royalty Tax System instead of the Production Sharing Agreement or Joint Venture System.

The main advantage of the Royalty Tax System, is that the resource owner, that is, the State, can get its resources exploited and receive benefits without making any financial contribution.

Under the system, the State derives its benefits from levies on production. The levies are:

1. Royalty;
2. Carried Interest;
3. Paying Interest;
4. Additional Oil Entitlement;
5. Petroleum Income Tax; and
6. Annual Surface Rental

ROYALTY

The Petroleum Law provides that the oil company (the venturer) pays royalty on production, but no figure has been fixed. However, the Model Petroleum Agreement which is in use at GNPC and which was prepared by GNPC and the Commonwealth Secretariat and approved by Government, made the rate negotiable between 5% and 12.5%, which is the range most countries apply.

Payment of royalty affects the profits of the operation, hence the industry practice has been to levy lower royalty rates on the more costly, riskier and deep sea operations, and then raise the levy to be commensurate with the level of risk associated with the onshore and

offshore shallow water operations. Royalty is levied on gross production of oil and gas by the State irrespective of the profitability of operations.

CARRIED INTEREST

Carried Interest is another source of revenue to the State. It is a participating interest in the oil exploration and production venture. Carried Interest is normally levied at a rate between 7½ and 15% in most oil producing countries. The same rate range is adopted in the Model Petroleum Agreement by the Ghana Government.

Carried Interest entitles the State to a share of the oil produced without making financial contribution towards exploration and development costs. Thus Carried Interest is levied after deduction of royalty and operating costs, but before the deduction of exploration and development costs from the total value of oil produced. It can be taken in the form of oil or cash.

ADDITIONAL INTEREST

Additional Interest, which is a paying interest, is an option for which if the State opts to exercise, will require the State to pay the proportionate share of only the development and production cost. No exploration and appraisal cost is paid by the State/GNPC. It is an option incorporated in the Petroleum Agreement to enhance the State's benefits which is exercisable by the State within sixty (60) days

after declaration of commerciality by the venturer or the investor company. There are various ways for paying this additional interest provided under the Petroleum Agreement:

- i) One method is where all the partners in the venture including the State represented by GNPC agree to go for project financing from financial institutions, using the proven reserves of the block as security.
- ii) A second method will be for the parties in the venture to pay for the State's proportionate share in the development and production operations. The State will reimburse the amount involved and interest thereon from its share of the oil produced over a negotiated period.
- iii) The third method is where the parties agree to finance the venture from their own resources.

This will require the State to find the resources to make payment upfront when cash calls are made.

PETROLEUM INCOME TAX

Petroleum Income Tax is a profit related revenue accruing to the State. The marginal tax rate is 35% for both Kosmos and Tullow. It can be taken in the form of oil or cash. We intend to take it in the form of oil.

ADDITIONAL OIL ENTITLEMENT

Additional Oil Entitlement which is also called “super normal” profit tax is additional profit tax that the Government is entitled to levy on operations in case of windfall profit, that is, where the venturer’s actual internal rate of return exceeds the targeted rate of return used to evaluate the profitability of the venture during the negotiations.

The targeted internal rate of return for Kosmos is 25% and that for Tullow is 19%. Hence, actual rate of return in excess of the targeted rate of return will be taxed at 5% for Kosmos and 7½% for Tullow.

MANAGEMENT AND CONTROL OF PETROLEUM OPERATIONS

There are several provisions in the Petroleum Agreement which enable GNPC participate in the petroleum operations and at the same time, exercise control of management of petroleum operations.

Fiscal provisions allow Investor to recover his cost in case of commercial discovery. Cost incurred by Investor directly affects the revenues to GNPC and Government. It is therefore important that GNPC and the Government closely monitor and control operations and cost.

This is even more paramount since the resource belongs to the State and therefore the State/GNPC should have a say in its exploration and exploitation. How is this achieved under the Petroleum Agreement?

Article 6 of the Petroleum Agreement provides for a Joint Management Committee which enables GNPC to actively take part in the management of petroleum operations. The Joint Management Committee is made up of a minimum of two representatives each from GNPC and Investor and it is chaired by GNPC.

The key functions of the JMC are:

1. Discussions and approvals of Work Programmes and Budget;
Having approved the detailed work programmes and budgets, Investor needs to submit expenditure at the end of the budget period for approval. GNPC vets the expenditure and has the power to reject any expenditure not properly incurred in the calculation of the Petroleum Cost.

The Accounting Guide incorporated in the Petroleum Agreement which describes the way the accounts should be organized and presented, also provide another avenue for the control of cost through the financial reporting and GNPC's right at any point during the operations to audit the accounts of Investor.

2. The bidding process, evaluating and award of contracts to subcontractors, are all subject to the approval of the JMC and GNPC; and
3. The JMC has to approve all cost before they are accepted as Petroleum Cost and thereby, eligible for deduction for Additional Oil Entitlement and Petroleum Income Tax purposes.

The JMC is given power to approve all appraisal and development plans before submission to the Minister for Energy for final approval.

The JMC meets minimum of twice in a year.

In the interim, there are various periodic reporting requirements that Investor has to submit to GNPC. These include, quarterly operational and financial reports, yearly statement of expenditure, and any other reports that GNPC and the government would request from the investor.

MONITORING OF PRODUCTION OPERATIONS BY GNPC

The production platform or floating production storage offshore (FPSO) and other facilities where oil and gas are produced, are metered. GNPC personnel on board will submit daily, weekly, monthly, quarterly and annual production reports. There will also be Customs representatives onboard all production facilities at all times.

In addition, GNPC arranges with the Navy for regular patrols in areas where production is taking place to protect installations and facilities and the product.

HYPOTHETICAL BENEFITS TO THE NATION IN THE CURRENT DISCOVERY

The benefits from any discovery is spelt out in the Petroleum Agreement before its execution.

Let us assume a production of 100,000 barrels per day, which is the minimum expected from the Mahogany/Hyedua Field in full field development. The computation of the State's benefits is shown in the Table below:

Computation Of The State's Benefits

Fiscal Benefits to the State (Assuming 100,000 Barrels per day @ US \$60 per Barrel	Reserves of 500 million barrels and Production Period of Fifteen (15) Years
A. Gross Production	100,000 barrels per day
B. Royalty	5% of A = 5,000 barrels a day
C. Net Production	95,000 barrels a day
D. Production Cost	10,000 barrels a day = cash equivalent
E. Basis for Carried Interest	C – D = 85,000 barrels a day
F. Carried Interest	10% of E = 8,500 per day
G. Development Cost	US \$3 billion @ US \$60 per barrel = 10,500 barrels a day
H. Basis for Additional Interest	E – F – G = 66,000 barrels per day
I. Additional Interest	3.75% of H = 2,475 barrels per day
J. Basis for Tax	H – I = 63,525 barrels per day
K. Tax	35% of J = 22,234 barrels per day
L. Total State Share	B + F + I + K = 38,209 barrels per day

From the above computation, oil accruing to the State is calculated as 38,209 barrels per day out of 100,000 barrels per day production and this multiplied by an assumed long term price of US \$60 a barrel amounts to US \$2,292,540.00 which translates to US \$836,777,100.00 per annum.

OTHER ECONOMIC BENEFITS

In addition to revenues due to the State from the fiscal arrangements in the Petroleum Agreement, petroleum operations, especially, development and production operations have the potential of transforming the economy through the participation of indigenous businesses.

The Petroleum Agreement provides for the use of Ghanaian goods and services in all phases of petroleum operations in so far as they are of quality and quantity comparable to industry standards and are priced competitively. This is what is popularly known in the industry as local content defined as “the quantum of composite value added or created in the Ghanaian economy through the utilization of Ghanaian human and material resources for the provision of goods and services to the petroleum industry within acceptable quality, health, safety and environmental standards in order to stimulate the development of indigenous capabilities”.

Criteria for defining such local content include the following:

- Percentage of Ghanaian Management in Service Companies set up in Ghana;
- Infrastructural investments in Ghana;
- Percentage of Ghanaian ownership in company;
- Percentage of Ghanaian Employees (Skilled and Unskilled);
- Percentage value of Services provided by Ghanaians;
- Percentage Value of Ghanaian Raw Materials utilized;
- Percentage Value of Ghanaian Finished Goods utilized;
- Technology Transfer/Capacity Development Programmes;
- New Employment Opportunities for Ghanaians; and
- Ghanaian Participation in the procurement of imported goods.

GNPC is empowered to monitor the use of local personnel, goods and services. The Petroleum Agreement demands that the investor submits his employment requirements to GNPC for approval.

Some of the ancillary business opportunities that might become available include the following:

- Dedicated shorebase to where a dedicated mini harbour with large acreage of land for warehousing and services will be available to service the industry;
- Onshore support and logistics;

- Office accommodation for numerous oil service companies that will move to set up here;
- Supply chain services to manage supplies to the Mahogany and Hyedua discoveries and to the entire West African sub-region;
- Expansion and rehabilitation of the Takoradi airport;
- Helicopter and fixed wing aircraft transportation;
- Supply boats, anchor handling boats, diving vessels, etc;
- Real Estate – housing of the numerous expatriate staff of oil companies and service companies;
- Telecommunications, weather forecasting, search and rescue facilities;
- Banking Services – financing for GNPC’s interest, transfers, letters of credit financing rigs and supply vessels, importing foreign flags rigs;
- Insurance – all equipment and facilities will have to be insured including the personnel;

- Construction Opportunities:
 - LNG pressure vessels
 - Petroleum separation
 - Construction, installation and commissioning of offshore structures
 - Pipeline manufacturing from steel
 - Electrical wiring of platforms and vessels
 - Installation and maintenance of instrumentation for production plants
 - Welding and Joinery
 - Hookup of structures already built in other countries
 - Assembling of knocked down structures in the yards
 - Tema Dry Dock to see increased activity.

The challenge is whether the Ghanaian business community will respond to the opportunities by setting up training institutions and companies to train the requisite personnel for the industry and to supply the required goods and services, some of which have been identified above.

To meet this challenge, the Government of Ghana, in conjunction with its development partners, will be organizing a National Consultative Forum and Workshop on Oil Sector Development at which the issue of local content in the development of the oil sector will be comprehensively addressed.

ENVIRONMENTAL MANAGEMENT AND CONTROL

In Ghana, both the Petroleum Law and the Petroleum Agreement demand strict adherence to the environmental laws and regulations of the country, specifically, the Environmental Protection Agency Act, Act 490 of 1994 and the Environmental Assessment Regulation, LI 1652. In addition, the Petroleum Agreement requires strict adherence to best international oil environmental practices.

The Development Plan in the Petroleum Agreement requires the investor to clearly spell out how he intends to develop the field so as to have the minimum negative impact on the environment. This has to be done to the satisfaction of GNPC, the Ministry of Energy and the Environmental Protection Agency before the Development Plan can be approved.

MONITORING AND IMPLEMENTATION

The Law requires Environmental, Health and Safety Audits of Investor's operations by EPA and GNPC. GNPC requires that a comprehensive Health, Safety and Environmental (HSE) Manual, detailing out how the Company intends to handle the health, safety and environmental issues, policies and procedures, is submitted for review and approval before any operations are commenced.

Emergency plans for handling accidents are discussed thoroughly among GNPC, EPA and the investor before the commencement of operations. All these are also contained in the Environmental Impact Assessment Report required to be submitted to the EPA for approval.

DECOMMISSIONING OR ABANDONMENT OF FIELDS

When production comes to an end, what happens to facilities that have been put in place for oil and gas production, the wells that have been used for the production? Whose responsibility is it to decommission, more so as at that time the ownership of these facilities is vested in GNPC? (The Law and Petroleum Agreement require GNPC has title to all equipment and facilities purchased and installed for petroleum operations once the cost has been recovered).

Unfortunately, this issue comes up at the end of production when Investor has no interest in the project anymore; and the cost of properly decommissioning these facilities could be very high.

This phenomenon of abandoning project sites after extraction of the resources has been responsible for several environmental disasters globally.

1. In our Petroleum Agreements with all investors, the obligation for decommissioning is clearly placed on the investor.
2. At the time of seeking approval to develop the field, Investor must include decommissioning proposals as part of the Development Plan.

3. The approved decommissioning plan must be reviewed and modified periodically to ensure that it remains consistent with the obligation to decommission.
4. At specified time during production, a decommissioning fund will be created into which funds will then be contributed to build up sufficient funds to completely decommission in accordance with the approved decommissioning plan. The fund is audited each year and it is under the control of GNPC and the oil company. This decommissioning fund could be put in escrow accounts or operated as a trust account.
5. If decommissioning cost is higher than funds available, the investor will be responsible to make it up through insurance.

The oil discovery is a good thing for Ghana. We can make it a "blessing instead of a curse".