

HANDBOOK ON OIL AND GAS FOR JOURNALISTS

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Foreword

The Handbook on Oil and Gas for Journalists is a document of our times. It is both timely and necessary from two important vantages. Since the confirmation of hydrocarbon material, especially oil and gas finds in Ghana's territorial offshore boundaries in the mid-2000s, the oil and gas sector has grown exponentially and continues to exert a growing influence in all areas of Ghana's economy, politics and society. On the other front, the media as a collective industry is playing a pivotal role not only in providing information on a daily basis to all sections of society but also in reflecting the concerns and values that are attached to even the most routine endeavours.

It is for the efficiency of the media's overall role in society that specialisations have developed in almost all sectors of our national life. Today, we have specialised and dedicated media for politics, sports, business and finance, health, education and the sub-divisions of these sectors. The oil and gas sector has important implications for our national life across all these disciplines, and therefore it stands to both reason and need that specific efforts would be made to make the media more responsive to this emerging giant of an activity-sector.

Ghana's oil and gas sector is being developed at a rather complex period in our national life and international economic and financial relations. Needless to say, the oil find raised expectations in the country to a level that perhaps could not be matched by performance, nonetheless it has changed the nature of the economy and discussions thereof forever, and it is important that journalists understand all the issues around the reality of oil and gas, expectations raised and how they are managed, including how revenues are raised, shared and used.

The need for a thorough understanding of the field is complicated by the international economic and financial climate, which has been rather unsettled since the financial crisis of 2008. The international credit squeeze and austerity measures in several developing countries has meant a cut in the demand, or at least in the growth of the demand for many products and this has an impact on oil and gas production. The potential impact of the oil and gas sector on both social and environmental dislocation has been noted in countries where the industry is older and must be an issue that can be tracked by journalists at this moment when the industry is at a take-off stage. International hydrocarbon rules will also play a factor in the fortunes of the sector and how it affects Ghana now and in the future.

The foregoing are some of the potent reasons why this Handbook produced by Pen plus Byte and funded by STAR-Ghana is so timely and necessary. The Handbook has covered all the bases from the chronology of oil exploration through the economic and social impacts of the industry and even its impact on our relations with our neighbours. It also includes useful Tips for Journalists to guide them through some of the more complex issues around production, distribution, revenue streams and how these must be attended to with a keen eye on responsibilities and transparency.

This book will be useful and required for any journalist who has to report the sector but equally essential for all journalists and even non-journalists who want to understand the oil and gas sector in Ghana. The effort has been commendable and will hopefully be rewarded as we find better and more meaningful reporting on oil and gas in the Ghana media.

Kwasi Gyan-Apenteng

JOURNALIST, MEMBER OF THE NATIONAL MEDIA COMMISSION

About Penplusbytes's Reporting Oil and Gas Project

Good governance of the oil and gas sector requires effective oversight from the media and CSOs. A knowledgeable media plays a critical role in helping inform and engage citizens, CSOs and parliament to effectively hold government and companies in the sector accountable. Towards this direction, Penplusbytes launched the "Reporting oil and Gas" project in 2009 with the key building blocks of an online portal, mailing list, mentoring of journalists, field trips, face-to-face and online training.

Under this project, Penplusbytes working with its partners Revenue Watch Institute and African Centre for Media Excellence (ACME) based in Uganda successfully completed the pilot phase of the pilot project "Strengthening Media Oversight of the Extractive Sectors – Pilot Program Ghana and Uganda" with the aim of increasing the quantity and quality of oil and gas stories. This project is currently in its second phase and has been expanded to include journalist from Tanzania in partnership with the Journalists Environmental Association from Tanzania(JET) to enhance their capacity in reporting on the oil, gas and mining industry.

Building on the success chalked under the previous projects, Penplusbytes with funding and technical support from STAR-Ghana is implementing a two year national project "Empowering the Media to Play an Active Watchdog Role over Ghana's Oil and Gas Revenues and Resources." The project seeks to empower the media to play an active watchdog role of Ghana's oil and gas revenues and resources leading to an improved coverage of oil and gas stories by the Ghanaian media leading to an increase in the quantity and quality (in terms of in-depth and investigative reporting) of oil and gas stories thus leading to the media playing an effective watchdog role over Ghana's Oil and Gas revenues and resources.

Project Objectives

- 1. To enhance the skills of journalists to undertake investigative and in-depth oil and gas reporting.
- 2. To facilitate the work of journalists and civil society organisations to actively use ICT tools in disseminating oil and gas information
- 3. To facilitate a vibrant online and offline dialogue through the provision of a useful ICT platform for key oil and gas industry actors

4. To empower the media through the provision of online communication system that facilitates effective information and knowledge exchange between the media and civil society leading to effective advocacy in the oil and gas sector

Project Activities:

- Baseline survey research
- Face-to-face forums for journalists and CSOs
- Online platform, mailing list and SMS Alerts
- Training Workshops
- Mentoring and field trips

Penplusbytes (www.penplusbytes.org) is serving as the coordinating organization for this project working hand in hand with key partners. Penplusbytes seeks to empower the media through the use of ICTs to advance the course of journalism. It consists of a network of media organizations and journalists interested in using ICTs effectively to advance their work.

The Reporting Oil and Gas project can be found at www.reportingoilandgas.org and its evolving online network of journalists working in the oil and gas area can be found at http://groups.google.com/group/reportingoilandgas





Chapter 1

INTRODUCTION



CHAPTER 1

By // Joe Asamoah, Ph.DOIL AND GAS CONSULTANT,
MD, ENERWISE AFRICA

Introduction

1. Chronology of Events in the Oil and Gas Industry

Chronology deals with the arrangement of dates, events, etc., in order of occurrence. For the purpose of this handbook, it is deemed appropriate to adopt a tabular format, which makes it easy for a busy journalist to do a quick check.

Date / Period	Event / Occurrence
1896	Hydrocarbon exploration in Ghana commenced with wells being drilled in the vicinity of Half-Assini as a result of oil seeps found in the onshore Tano Basin in the Western Region of Ghana. (Tullow Oil plc, 2012).
Later part of 19th Century – 2nd WW	Evidence existed of commercial oil drilling in the later part of the 19th Century till the Second World War (WWII) at Boka Agloe, a small community in the Jomoro District in the Western Region of Ghana. There is ample evidence that the drilling machines are still buried under the ground with some oil spewing out from boreholes (Nkrumah et al 2008).
1970	The Saltpond Field (SF) was found by Signal Amoco almost 100 km west of Accra (Tullow Oil plc, 2012).
1978 – 1985	Between 1978 and 1985 a total of about 3.47 million barrels of oil was produced from the SF and 14 billion cubic feet of gas was flared. A platform, Mr. Louie, used for the production is still in place (Tullow Oil plc, 2012).

2000	Operations recommenced and the SF is now producing approximately 600 barrels of oil per day (Tullow Oil plc, 2012).
2000 – 2007	Oil exploration in offshore Ghana intensified, resulting in the Jubilee find. Over 50 exploration wells have been drilled in the process; 75% of which showed indications of hydrocarbons and ten discoveries made (Edjekumhene et al, 2010).
2004	With the benefit of retrospection, the culmination by GNPC of a Petroleum Agreement with a Consortium of Kosmos Energy (operator), Tullow Oil, Anadarko, Sabre Oil and E.O. Group for the exploration of West Cape Three Points Block in July 2004 was a harbinger of good news with respect to the black gold. Furthermore, the award of Tano deep-water to a consortium consisting of Tullow Oil (operator), Kosmos Energy, Anadarko and Sabre Oil in 2006, also paved way for the huge oil and gas find, in 2007 (Asamoah, 2010).
June 07, 2007	The trailblazing Mahogany-1 oil was found. It is situated almost 63km from Half Assini and 132 KM southwest of the port city of Takoradi (Asamoah, 2010).
August 07, 2007	Oil in commercial quantities was again found in the Hyedua-1 well. The discovery was made approximately 5.3km southwest of Mahogany-1 well in Tullow Tano Deepwater Block. The over-all drilling of the well was to a depth of 4,002m, encountering a gross reservoir interval of 202m, with a net hydrocarbon-bearing pay of 41m. The result of the well showed that the reservoir sands were in pressure communication with the Mahogany-1 well (Asamoah, 2010).
February 25, 2008	The Odum-1 well is one of the series of Ghana's findings. It was discovered on the West Cape Three Points Block. It is situated approximately 13km east of the Jubilee Field, 51km from the coastline and 117km southwest of the port city of Takoradi. The well, drilled to a total depth of 3,386m, encountered a gross oil column of 60m and a net oil-bearing pay of 22m. The fluid samples which were recovered from the reservoir showed an oil gravity of approximately 290API (oil and gas Journal, 2009).

First Quarter 2009

Tullow Oil reported that it had discovered an enormous highly-pressurised light hydrocarbon accumulation in the Tweneboah-1 exploration well. The latter was drilled on the Deepwater Tano licence offshore Ghana. According to the report, the well came across 21m of net pay at a drilling depth of 3,593m (Oil Voice, 2009). More significantly, this discovery has provided a westward extension to the Jubilee play, including an identification of oil in deeper sand with a pointer to a scope for additional play development. A subsequent deepening of Tweneboah-well to 3,938m encountered 4m of highly-pressurised oil-bearing sand. The totality of wireline logs, pressure measurements and sampling revealed oil with 260 gravity; that is independent of the thinner light hydrocarbon gathering (oil and gas Journal, 2009).

September 2009

The Sankofa-A1 is another discovery offshore Ghana. The well lies 38km east of the Jubilee field and 21 km east of Odum discovery in the West Cape Three Points block. It was jointly drilled by GNPC and Vitol Upstream Ghana Limited (Vitol). This discovery has a net hydrocarbon column of about 36.3 m with 33.2 m of gas and 3.2 m of oil in reservoir sands of Campania age. The Sankofa-A1 well was drilled with the Blackford Dolphin Semi- Submersible drilling rig in water depths of 866 m and reached a total depth of 3704 m within the Vitol Block. The latter covers an area of 2,080 square kilometers in water depths with a range of 50 m to 1400 m. whereas Vitol has a 90% interest in the block; GNPC has carried interest of interest payment on commercial discovery (Asamoah, 2010).

February 2010

Vanco Ghana Ltd. And Lukoil Overseas Ghana Ltd. Made an oil and gascondensate discovery in the Dzata-1 well offshore the Republic of Ghana. At a depth of 11,985 feet (3,653 meters), the well encountered a gross hydrocarbon column of 308 feet (94 meters) with 82 feet (25 meters) of net stacked oil and gas pay before reaching a total depth of 14,544 feet (4,433 meters). The primary reservoir sandstone contained gas and light oil; and volatile black oil was recovered from a slightly deeper zone. Drilled on the Cape Three Points Deepwater Block in 6,161 feet (1,878 meters) of water by the Sedco 702 semisub, the Dzata-1 well is the deepest water exploration well drilled to date in Ghanaian Tano Basin. The well has been plugged and temporarily abandoned. Vanco operates the block, holding a 28.34% interest; Lukoil holds 56.66%; GNPC holds a 15% carried interest, with the option to acquire up to an additional 5% in any commercial discovery (Offshore Field Development Project, 2010).

July 2010	Tullow Oil made another potentially key oil discovery in Ghana's deepwater play fairway. Owo-1, drilled in 1,428 m (4,685 ft.) of water in the Deepwater Tano license offshore Ghana, intersected "a significant column of excellent quality light oil." Analysis of drilling, wireline logs, and reservoir fluid samples suggest this is a large new oil field warranting further appraisal. The deviated well, drilled by the semisubmersible Sedco 702 from a location around 6 km (3.7 mi) west of the Tweneboa wells, encountered a gross vertical reservoir interval of 154 m (505 ft), including 53 m (174 ft.) of net oil pay in two zones of good-quality, stacked reservoir sandstones (Ball, 2010). Early results from the Owo field suggested it was a "transformational discovery", according to Tullow's Exploration Director Angus McCoss. The Owo well is one of three deep-water wells offshore of Ghana that Tullow started drilling in the year, 2010. The company had projected that the project could uncover as many as 1.4bn barrels of oil equivalent. Owo has subsequently been named Enyenra.
15th December 2010	First oil was produced this day, after the symbolic turning of a wheel by the late President John Evans Atta Mills. The daily output of oil at that time was about 45,000 barrels per day.
February 2011	Local Content and Local Participation in Petroleum Related Activities – Policy Framework
11th April 2011	Presidential Assent given to the Petroleum Revenue Management Bill to become Act, 2011 (Act 815)
14th July 2011	Presidential Assent given to the Ghana Petroleum Commission Bill to become Act, 2011 (Act 821)
2012	Production of oil commenced from TEN (Tweneboa, Enyenra and Ntomme) wells. This helped to raise offshore oil production to about 110,000 barrels/day.

Tips for Journalists 1

Journalists may want to know whether these discoveries are bound by proper contracts between the Government of Ghana and the oil Exploration and Production companies. If no, why not, and if yes, are those contracts in the public domain? Which of these discoveries have a proper timeline for appraisal, development and production? Further, how effective are these Acts and Policies in ensuring that our oil and gas production does not become a curse? Having been in operation for at least a year, are these laws potent enough, and if not what amendments are required thereof?

2. The Geopolitics of the Oil and Gas sector

Geopolitics is the study of the effects of geography (both human and physical) on international politics and international relations. Geopolitics is a method of foreign policy analysis, which seeks to understand, explain, and predict international political behaviour, primarily, in terms of geographical variables. Typical geographical variables are the physical location, size, climate, topography, demography, natural resources, and technological advances of the state being evaluated.

Energy has always been at the centre-stage of some constantly changing geopolitical contours of the world. Since conventional energy resources i.e. the fossil fuels are highly unevenly distributed across the globe, the competition for control over them eats up much of energy hungry major economies time and money. With global energy demand increasing sharply and reserves being limited, this competition has only become intense with time; and is bound to reach unprecedented levels in future (Jafri, 2011).

Côte d'Ivoire Stakes a Claim on Ghana's Oil Reserves

Ghana's discovery of oil reserves off its coast sparked off a row with Côte d'Ivoire over the border in February 2010, with Accra accusing Abidjan of claiming part of its maritime space. "It is our hope that the two countries can come out with an amicable solution to the issue working in the same spirit that guided the demarcation of the land boundaries," Desire Tagro, the then Ivorian interior minister, articulated at the start of a two-day border talks.

The maritime boundary dispute cast uncertainties on future international oil claims contiguous to the contested area and raised questions about the reaction of foreign investors to the uncertainty then. Earlier that month, Côte d'Ivoire appealed to the United Nations to delineate its offshore border with Ghana, a bid seen as controversial since Russia's Lukoil discovered oil reserves offshore Ghana, only days before. Ghana's Jubilee field began operations later that year and gave the country a commercial oil-producer status (Sheikh, 2010).

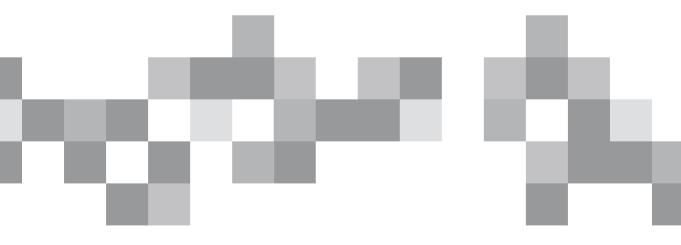
Subsequently, Côte d'Ivoire appealed to the United Nations to do a demarcation on her offshore border with Ghana, a bid that had been seen as controversial, since Russia's Lukoil found oil reserves only days before, off Ghana's coast. The two countries' boundary commissions were expected to map out ways the border drawing negotiations should do its work, despite both having already presented their proposals to the United Nations for the determination of the maritime boundaries (Radio Netherlands World, 2010).

The outcome of the maritime boundary row had been purported to have had a bearing on a number of small and medium-sized companies on both ends, Spio-Garbrah remarked. Firms like Kosmos Energy, Exxon, Total and Tullow Oil are all "sort of concerned" about the conflict, he said (Sheikh, 2010).

Tips for Journalists 2

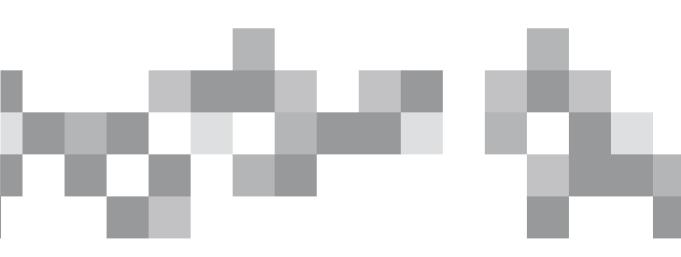
What progress has been made by the boundary commissions of Ghana and Côte d'Ivoire in resolving the boundary dispute between the two countries? There is a possibility that the two countries may jointly work the oil wells close to the maritime border between them. If the two countries are unable to resolve the row, they are likely to jointly resort to the UN for assistance and if possible adjudication.





Chapter 2

THE LEGAL AND REGULATORY FRAMEWORK GOVERNING THE OIL AND GAS SECTOR



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THE LEGAL AND REGULATORY FRAMEWORK GOVERNING THE OIL AND GAS SECTOR

By // Kwame Mfodwo & Livia Dasoveanu NATAURAL RESOURCES LEGAL EXPERTS

This chapter outlines the various mechanisms used by Ghana to create a legal and regulatory framework governing the oil and gas sector.

1. Background

There are four main statutes managing the petroleum industry in Ghana. These are:

- The Petroleum Exploration and Development Law, 1984 (PNDCL 84): provides the framework for the management of oil and gas exploration and development. Outlines the basic terms and conditions of petroleum agreement negotiated and executed in Ghana.
- The Ghana National Petroleum Corporation Law, 1983 (PNDCL 64): establishes the Ghana National Petroleum Corporation and charges the corporation first as a regulator and second as a participating agent in exploration and production.
- The Petroleum Income Tax Law, 1987 (PNDCL 188): sets out the taxation elements of petroleum operations.
- Petroleum Revenue Management Act of 2011

These four principal statutes are supplemented by, among other things, the GNPC Model Petroleum Agreement (MPA), Environmental Protection Agency Act, 1994 (Act 490), and the National Petroleum Authority Act, 2005 (Act 691).

Key bodies instituted to regulate the petroleum industry include:

■ The National Petroleum Authority, the government agency responsible for regulating downstream petroleum activities

■ Ghana's Petroleum Directorate, the technical arm of the Ministry of

Energy, supervises and formulates overall policy for the petroleum sub-sector

- Ghana National Petroleum Corporation
- Environmental Protection Agency
- Petroleum Commission, Ghana

Additionally, more legislative changes expected to the current petroleum regime with two further Bills currently with parliament and yet to be enacted:

- Petroleum Revenue Management Bill 2010
- Petroleum Exploration And Production Bill 2010

2. Key policies, laws and regulations

Local Content and Participation Policy

This is a policy framework established in 2010 by the Ministry of Energy, which provides guidelines for local content and local participation in petroleum activities

Under the policy paper, the Ministry of Energy outlines the following goals:

- exploiting of the country's oil and gas endowment sustainably;
- managing oil and gas revenue judiciously for the overall benefit and welfare of all Ghanaians, including future generations;
- attracting increased local value-added investments in the oil and gas sector;
- creating job opportunities in the oil and gas and related industries; and
- indigenizing knowledge, expertise and technology in the oil and gas and related industries.

The policy provides for the following:

 Mandatory Local Content in Oil and Gas Development: Every project, operation, activity or transaction must have a Annual Local Content Plan, assessed and revised annually.

- Interest of a citizen of Ghana in Petroleum Exploration, Development and Production: first consideration to Ghanaian independent operators; non-Ghanaian operators have mandated Ghanaian citizen requirement
- Provision of goods and services by national entrepreneurs: use goods and services produced by or provided in Ghana
- Employment and training of citizens of Ghana: Annual Recruitment and Training Programme for recruitment and training of citizens of Ghana in all job classifications and in all aspects of petroleum activities
- Creation of the National Local Content Committee: regulatory authority set up to oversee implementation of local content and local participation policy

Petroleum Commission Act 2011

This Act establishes the Petroleum Commission for the regulation and management of the utilisation of petroleum resources and to provide for related purposes.

The Commission takes over the regulatory role which used to be played by the Ghana National Petroleum Corporation. This frees GNPC to act as the national oil company to partner international oil companies in the exploration and production of the country's oil and gas resources.

The main objective of the Commission is to regulate and manage the utilisation of petroleum resources and to co-ordinate the policies in relation to them.

It performs a gamut of regulatory functions including;

- To promote planned, well executed, sustainable and cost efficient petroleum activities to achieve optimal levels of resource exploitation
- To recommend to the Minister, national policies related to petroleum activities
- To monitor and ensure compliance with national policies, laws; regulations and agreements related to petroleum activities

- To ensure compliance with Health Safety and Environment standards
- To ensure optimum exploitation of petroleum resources
- To ensure optimal utilisation of existing and planned petroleum infrastructure
- To ensure compliance with fiscal metering requirements
- To receive and store petroleum data
- Receive applications and issue permits for specific petroleum activities
- Decommissioning plans for petroleum fields
- Promote local content and local participation in petroleum activities as prescribed by the Petroleum Exploration and Production Act 1984

The Petroleum Revenue Management Act of 2011

- The PRMA passed by the Ghanaian Parliament in April 2011
- Purpose to establish a framework for collection, allocation and management of petroleum revenue in a responsible, transparent, accountable and sustainable manner
- Outlines rules for petroleum revenue inflows and outflows, establishing a Petroleum Holding Fund (PHF) to receive and disburse all petroleum revenues.
- From this holding fund, 70 percent of oil revenues are to be disbursed to the government budget, with the remaining 30 percent deposited in two newly created funds, the Heritage fund (receiving 9%) and Stabilisation fund (receiving 21%)
- The objective of the Ghana Stabilization Fund is to sustain public expenditure capacity during periods of unanticipated revenue shortfalls
- Ghana Heritage Fund provides an endowment to support development for future generations when Ghana's petroleum resources are depleted.

Clauses concerned with transparency and accountability:

- Clause 8: publication of records of petroleum receipts in the newspapers and online
- Clause 16: Minister of Finance to reconcile quarterly petroleum receipts and expenditures

- Clauses 46 to 48: types of audits of the petroleum accounts: internal, external, annual and special
- Clause 50: Minister
 of Finance to submit to
 Parliament an annual report
 on the Petroleum Account and
 the Ghana Petroleum Funds
- Clause 51: information or data that could impact the performance of the Ghana Petroleum Fund if disclosed may be declared by the Minister as confidential,

subject to the approval of Parliament

- Clause 52: criminalises the failure by a person to comply with the obligation to publish information under the bill
- Clause 53: establishment of the Public Interest and Accountability Committee These clauses, taken together, are aimed at placing Ghana in line with the requirements of the Extractive Industries Transparency Initiative.

Transparency and accountability

The PRMA provides for reporting on multiple levels, with reporting authorities including:

- the Ghana Revenue Authority,
- the Ministry of Finance and Economic Planning,
- the Bank of Ghana.
- the Investment Advisory Committee,
- the Auditor- General.
- the Public Interest and Accountability Committee.
- Bank of Ghana is to conduct internal audits of Ghana's petroleum funds,
- The Auditor-General conducts external audits.

The Public Interest and Accountability Committee, a new body comprised of citizens responsible for independent oversight of the management of petroleum revenues, is to publish semi-annual and annual reports in two state-owned newspapers and online, and hold meetings twice every year to discuss the reports with the public.

Issues of contention:

- 1. The establishment of the Heritage Fund
- The diversion of 9% of all petroleum revenues to the Heritage Fund, whose objective is to provide funds for future generations. This is problem given that Ghana is facing serious developmental challenges in the present.
- 2. The collateralisation of petroleum revenues under Clause 5, referring to a process in which the government uses its petroleum revenue as collateral if it defaults on a loan.
- Could lead to inflation associated with "dutch disease" and eventually bring on the effects of the resource curse.

National Petroleum Authority

- Regulates, oversees and monitors the downstream petroleum industry in Ghana.
- Was established in the National Petroleum Authority Act of 2005.
- As of late 2011, Ghana's downstream petroleum sector, over which the NPA has authority, included 45 oil trading companies, nine bulk distributing companies, 59 oil marketing companies, 19 liquid petroleum gas (LPG) marketing companies, one refinery, and 1,750 petroleum products outlets.

Functions of the NPA, include:

- Monitoring and regulation of ceilings on the prices, i.e. subsidies, of petroleum products in consultation with the Ministry of Energy
- Implementation the Unified Petroleum Price Fund (UPPF) to ensure that petroleum prices are uniform throughout the country

- Regulation of the bulk importation of refined petroleum products
- Provision of guidelines for petroleum marketing operations
- Overseeing of the logistics of distributing petroleum products across the country
- Granting licenses to and promotes competition among service providers and marketing companies
- Inspection of petroleum service providers and their outlets to monitor their compliance with health, safety and environmental standards

Ghana Petroleum Regulatory Authority Bill

- The Ghana Petroleum Regulatory Authority Bill of 2008 proposes the formation of a regulatory authority to regulate, oversee and monitor activities in Ghana's petroleum industry, covering upstream, midstream and downstream petroleum operations.
- 2012 Parliament had not approved it and the bill had not yet passed.
- Proposed Ghana Petroleum Regulatory Authority (GPRA) is to enable increased private sector participation and investment, promote a vendor development program to enhance national participation in the supply chain process, and strengthen the regulatory framework for healthy competition in Ghana's petroleum sector.

MPA provides for extractive industry considerations such as:

- contract scope,
- exploration period,
- minimum exploration requirements,
- joint management,
- contractor rights and obligations,
- commerciality,
- sole risk accounts,
- oil sharing,
- measuring and pricing,

- taxation,
- domestic supply requirements,
- inspection and environmental protection,
- accounting and auditing
- other aspects of petroleum agreements.

- Also to initiate, negotiate and administer petroleum agreements and assess appraisal programs, field development plans, tail end production and the decommissioning of petroleum fields and facilities for approval.
- Seeks to decouple the GNPC's role as both the petroleum industry's major player and its regulator, defining it as a strictly commercial entity

3. The GNPC model petroleum agreement

Ghana's Model Petroleum Agreement provides the template for petroleum exploration and production licensing between the Ghana Government, the Ghana National Petroleum Corporation and multinational companies to produce oil and gas emanates from these statutes.

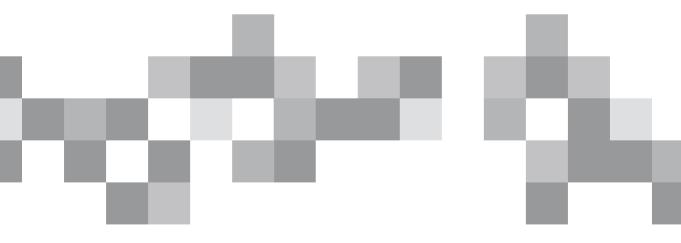
Created in 2000, it governs future petroleum contracts between Ghana and other contractors.

The MPA emanates from the Petroleum Exploration and Production Law to guide the implementation of the legislation. Briefly, it guides the process of negotiating the terms and conditions of a Petroleum Agreement among the parties thereto, namely, GNPC, Government of Ghana and the oil company, embodies the final terms and conditions to regulate the intended petroleum operations, and outlines the specific fiscal terms, cost, accounting and reporting of the contractors.

Questions to consider:

- What are the industry standards, who established them, and who enforces them in the absence of an independent regulatory authority?
- Are the Ministry of Energy and the Petroleum Commission Ghana able to assert compliance and ensure enforcement?
- Do they have the means to effect appropriate remedies and sanctions if needed?





Chapter 3

LICENSING AND CONTRACTS IN THE OIL AND GAS SECTOR



CHAPTER 3

LICENSING AND CONTRACTS IN THE OIL AND GAS SECTOR

By // Kwame Mfodwo & Livia Dasoveanu
NATAURAL RESOURCES LEGAL EXPERTS

This chapter outlines the standard contracts in the oil and gas industry.

etroleum contracts typically involve any number of stakeholders and can relate to any part of the oil and gas project phase (exploration, development, production, decommissioning, all of these need to be addressed in a petroleum contract).

Three options are generally available to Governments in developing their natural resources:

- the creation of a state owned company for exploration, development, and production
- invitation of private investors to develop the natural resources
- a combination of the above two systems

Types of contracts

Concession/license agreements

This is the most common type of contractual arrangement found in the oil and gas industry.

Often grants an oil company exclusive rights to explore, develop, sell, and export oil extracted from a specified area for a fixed period of time. Basically, this means that a contractor "owns" the oil in the ground.

 Companies compete for exclusive rights by offering bids, often coupled with signing bonuses

From a developing country's point of view there are substantial advantages to this type of arrangement:

- 1. Licenses are more straightforward than other types of agreements
- 2. The degree of professional support and expertise required is often less complex than that needed to negotiate joint ventures or production-sharing agreements. These licensing agreements still need sound financial advisers to structure the concession bidding system as well as reliable legal infrastructure, including a judiciary capable of interpreting complex agreements.
- 3. Note: some agreements will require gap filling where a legal system lacks provisions
- 4. The financial and other terms of the license are included in the agreement as drafted by the host government.
- 5. Fees paid by the successful bidder (license fee) are kept by the host government regardless of whether oil is found and commercial production takes place.
- 6. Further, if commercial production occurs, the host government also earns royalties (based on gross revenue and/or a profit tax based on net income)
- 7. All financial risks of development, including the costs of exploration, are absorbed by the successful bidder.
- 8. This means that there are few serious financial risks for the host government other than the loss of opportunity or the loss of time if the bidding system does not attract an acceptable, financially strong, and technically competent bidder.

Disadvantages:

■ Lack of adequate knowledge/certainty about the potential of a concession since seismic exploration has not been fully undertaken.

- No guarantee the concession will cover an oil company's costs and return a profit, this means that the company will be more conservative in its bidding
- Where knowledge and facts are inadequate, the host government will not maximize its potential return from an auction system.

Tips for journalists on key things to ask or flag:

- Details of the tendering process including: How many companies bid? What has the successful bidder agreed to pay?
- Details of the contract with the successful bidder, including: How long is the exploration phase, development phase, production phase? How much has the bidder agreed to invest?
- Environmental impact: What environmental standards will be adhered to? Pollution and spill management? Who will regulate and ensure compliance with environmental standards? Will the contract involve displacement of residents?

Joint Venture Agreements

Less commonly used as a basic form of agreement between oil company and government.

- A Joint venture involves two or more parties who wish to pursue a joint undertaking
- In this type of arrangement, parties need to have a thorough understanding of each other's goals and interests, this will form the basis of a workable agreement.
- Requires extensive negotiation over an extended period of time. This is to ensure all matters are addressed and that the parties agree on how to work with each other.

For a host government, this type of arrangement is advantageous since it will not be solely accountable for a project, rather, it can rely on the extensive expertise of a major oil company. It will also share the profits, on top of any other remuneration like taxes or royalties.

The major disadvantage in this type of arrangement for a host government is

that it carries with it potential liability since risks and costs are shared and the government is a direct participant in the resource extraction.

Tips for journalists on key things to ask or flag:

- Why a joint venture?
- What is the government receiving for taking on extra risks associated with JV?

Production-sharing agreements

- Do not give an ownership right to the oil, rather this remains in the State and the State contracts out to foreign corporations to manage and operate the development of the oil field
- Oil company carries most financial risks of exploration and development
- The State also faces some risk since often the national oil company joins the group as an interest holder in the PSA
- The financial terms of the PSAs are similar to those of the license agreement
- The foreign company is required to pay taxes on its share, but these are often waived by the host government and included in the company's portion of the agreed percentage split.
- The complexity of a PSA depends on the soundness of the legal infrastructure of a state. For example, if a country does not possess basic rules governing petroleum operations, the issues normally covered by such a law will have to be addressed in the PSA. In short, the less reliable and/or predictable a state's legal system the more issues must be covered and specified within a PSA

Advantages:

- All financial and operational risk rests with the international oil companies.
- The host government does not risk losses other than the cost of the negotiations (mainly fees paid to advisers).

- At most, the host government loses an opportunity but suffers no material loss if an exploration or development project fails.
- A host government has the added advantage that it shares any potential profits without having to make an investment, unless it agreed to do so.

Disadvantages for a host government:

- It puts a premium on very professional negotiations and the government having access to technical, environmental, financial, commercial, and legal expertise.
- In structuring the financial provisions, the government must undertake to assess the reserve potential of the oil fields, even though accurate information may not be readily available.
- In fact, a host government often has considerably less data and technical and commercial knowledge than the oil companies.
- It has to balance the desire for higher profits with the enforcement of environmental and other regulations. The cost of environmental compliance cuts into profits. Also, the lower the amount of a company's profits, the less taxes it will pay to the government.

Chapter 4

EXPLORATION IN OIL AND GAS



CHAPTER 4

EXPLORATION IN OIL AND GAS

By // Stephen Kudom Donyinah, Ph.DSENIOR LECTURER, CHEMICAL ENGINEERING, KNUST, GHANA

Introduction

or the industrial nations of the world, it may be reasonably stated that petroleum has fueled the world in the last century and will continue into this century. Despite accelerating depletion of the resource, oil and gas will remain major contributor to the world energy supply into this century. It represents one third of the energy supply market.

The upstream of the petroleum industry involves itself in the business of oil and gas exploration and production (E & P) activities. While the exploration activities find oil and gas reserves, the Production activities deliver oil and gas to the downstream of the industry (i.e., processing plants).

After exploration activities have taken place and evidence show that there is indication in the formation oil and gas potentials then there will be the need of appraisal and it is after the appraisal results proves have indicated positive potentials of oil and gas potentials that the Exploration and Production (E&P) company will then take a decision as to go into production or not. There is also financial appraisal that involves capital investment expenditure and possible profit.

Following the trend of development in technology, the few countries that have discovered oil in commercial quantities included Algeria, Libya, Nigeria. Cameroun, Gabon Congo and Angola These were early countries that formed the first generation of oil producers in Africa in the 1950s. Then followed the second generation of African countries in the 1070s which were Chad, Niger, Ethiopia, Tunisia, offshore Egypt and Ghana (Saltpond).

Third and continuous phase started in Mid 1990s and targeted, deep seas of Mauritania, Nigeria, Equatoria Guinea, Angola, Nile-Delta of Egypt and Jubilee field of Ghana. All these were related to the modern trend of Technology.

What is Petroleum?

Petroleum may be defined as naturally occurring mixtures made up of predominantly organic carbon and hydrogen compounds. It also frequently contains significant amounts of nitrogen, sulfur and oxygen together with smaller quantities of nickel, Vanadium and other elements Crude oils from different sources and its derivatives vary widely according to the relative amounts of the different fractions and the content of various adulterants, particularly sulphur

Where does oil come from/what is the genesis of petroleum?

The commodity as we know it exists in the subsurface of the earth and mostly in sedimentary rocks. It is believed that high heat and intense pressure supports various chemical reactions, transforming the soft parts of ancient organisms found in the deep-sea sludge into oil and natural gas. At this point, this ooze at the bottom of the ocean turns into source rock. Within the time especially in nutrient-rich waters, organic remains pile up on the sea floor.

The overlying sediments that are constantly being deposited bury these organic remains so deeply that they will eventually be turned into solid rock

The commodity as we know it exists in certain known geological formations. The notable geological formations are: basins, continental shelves and deltas. These are explained below.

Basins: Over the passage of time, the movements in the plates that form the earth's crust close and open oceans, build mountains. When oceans close, this is usually associated with a period of mountain building, the mountains provide the basin with a source of sediment.

As the basin gradually fills with sediment, the remaining water becomes more saturated with salt. In warm environments, the sea water evaporates and thick layers of salt (an 'evaporitic rock') are deposited. This forms the salt layer trap, which is subsequently covered with more sediment.

Continental shelves are oil producing because of the abundance of marine life in the seas. The shelf provides a vast area over which fine sediment and organic matter can accumulate.

As the ocean closes, the shelf is uplifted and buried beneath sandy basin sediments.

Continental shelves are oil producing for reasons related to changing sea level.

Deltas: As the delta builds out, it covers the finer, more shale sediments found at the seaward end of the delta with more sandy sediments brought from on land.

A subsequent rise in sea level/compaction of the delta sediments will flood the delta, and marine shale will be deposited over the sands

Exploration Activities:

These include surface inspection, Satellite imagery gravity and magnetic surveying and seismic surveys or methods.

Surface Inspection

Surface inspection involves geologists handpicking rocks suspected to be rocks associated with oil and gas formation, take samples and later evaluate them for further studies.

Satellite Imagery

Satellite imagery involves aerial survey with satellites and picking images suspected to be geological formations of interests to oil and gas formations and later do the interpretations for detailed information.

Gravity and Magnetic

Gravity and magnetic surveys are picking magnetic and gravitational properties of the earth's crusts associated with rocks associated with oil and gas formations.

Seismic Surveys

Seismic surveys are conducted to pinpoint potential hydrocarbon reserves in geological formations deep below the seafloor. Seismic technology uses the reflection of sound waves, to identify subsurface formations. In modern marine seismic surveys, as many as 16 "streamers" (cables containing the hydrophones used to detect the sound reflected from the subsurface) are towed behind the seismic vessel, at a depth of 5 to 10 meters (m). Each cable can be as long as 8 to 10 kilometers (km). In addition to the hydrophone array, the vessel tows seismic source arrays comprising a number of air guns which discharge sound bursts of

between 200–250 decibels (dB) downward. The sound bursts, repeated on average every 6 to 10 seconds, are reflected off deep geological formations and recorded by the hydrophone array.

Exploration drilling

Exploratory drilling activities offshore follow the analysis of seismic data to verify and quantify the amount and extent of oil and gas resources from potentially productive geological formations. If oil or gas is encountered, then additional development drilling may be undertaken.

There are various types of offshore drilling rigs, including:

Jack-up rigs: Suitable for shallower water up to around 100 m and transported to location either under their own propulsion, or towed by tugs. Once there, electric or hydraulic jacks lower three or four legs to the seafloor to support the drilling platform above water.

Semi-submersible rigs: Suitable for deep waters and transported to location either under their own propulsion, or towed by tugs. The hull is partially submerged and the rig held in place by a series of anchors.

Submersible rigs: Limited to shallow waters and towed onto location. Consisting of two hulls: an upper hull, or platform, and lower hull that is filled with water and submerged to the seafloor.

Drilling barges as floating platform: Suitable for shallow waters, estuarine areas, lakes, marshes, swamps and rivers. Not suitable for open or deep water, towed onto location.

Drillships: Designed for drilling in deep water locations.

Drilling takes place from a drilling platform and derrick positioned in the middle of the deck, from which drill stems are lowered through a hole in the hull (moonhole).

Once on location, a series of well sections of decreasing diameter are drilled from the rig. A drill bit, attached to the drill string suspended from the rig's derrick, is rotated in the well.

Drill collars are attached to add weight and drilling fluids are circulated through the drill string and pumped through the drill bit. The fluid has a number of functions. It imparts hydraulic force that assists the drill bit cutting action, and it cools the bit, removes cuttings rock from the wellbore and protects the well against formation pressures. When each well section has been drilled, steel casing is run into the hole and cemented into place to prevent well collapse.

When the reservoir is reached, the well may be completed and tested by running a production liner and equipment to flow the hydrocarbons to the surface to establish reservoir properties in a test separator.

Field Development

Field development may occur after exploration (and additional appraisal well drilling) has located and confirmed economically recoverable reserves of hydrocarbons. In many cases, this will involve the installation of an offshore drilling and production platform that is self sufficient in terms of energy and water needs for the workforce and for drilling wells and processing hydrocarbons ready for export.

There are many types of offshore platforms, including:

Fixed platforms: Used in water depths of up to around 500 m and consisting of steel or concrete legs (jacket) secured directly to the seabed by steel piles that support a steel deck. Drilling equipment, production facilities and accommodation are typically housed on the deck.

Compliant towers: Used in water depths ranging from around 500 m up to 1,000 m and consisting of a narrow, flexible tower on a piled foundation supporting a conventional deck.

Tension leg platforms: Used in water depths of up to about 2,000 m and consists of a floating facility moored to the seabed and fixed in place by anchors. Mini tension leg platforms (Seastars) exist that are used in water depths of between 200 m and 1,000 m.

Jack-up platforms: Used in shallower water up to around 100m and transported to location where the legs are lowered by hydraulic jacks into position to support the deck.

Spar platforms: Used in water depths of between 500 m and 1,700 m and consisting of a cylindrical hull supporting a floating platform.

Floating production systems: Ships equipped with processing facilities and moored on location with a series of anchors. Frequently converted oil tankers, the main types of floating production systems are Floating,

Production, Storage and Offloading (FPSO) systems, Floating, Storage and Offloading (FSO) systems, and Floating Storage Units (FSU).

Production platforms will provide facilities for the separation of formation fluids into oil, gas, and water. Depending on the project, the platform may only be used for production as drilling can be conducted from a separate drilling rig brought alongside. Some platforms are only used to bring the hydrocarbons to surface and directly export them for processing, whilst some gas platforms may be unmanned during routine production operations. Typically, multiple wells are drilled from the platform location using directional drilling techniques. In some cases, where field extremities not reachable by directional drilling from the fixed location or where small reservoirs exist, subsea production units are installed on the seabed following drilling and the produced hydrocarbons are tied into a nearby platform facility by a system of risers.

Following development drilling and well completion in readiness for the flow of formation fluids, a "Christmas tree", which allows the control of flow to the surface, is placed onto the well head.

The oil and / or gas are produced by separation of the formation fluid mixture into oil and gas and water, or gas and condensates at the platform. Oil is exported from the platform by either pumping into a sub-sea pipeline to shore, or to a floating storage unit offshore, or directly to a tanker. Typically, gas is exported through a pipeline.





Chapter 5

THE OIL AND GAS PRODUCTION PROCESS



CHAPTER 5

THE OIL AND GAS PRODUCTION PROCESS

By // Stephen Kudom Donyinah, Ph.DSENIOR LECTURER, CHEMICAL ENGINEERING, KNUST, GHANA

Introduction

he upstream of the petroleum industry involves itself in the business of oil and gas exploration and production (E & P) activities. While the exploration activities find oil and gas reserves, the Production activities deliver oil and gas to the downstream of the industry (i.e., processing plants).

The petroleum production is definitely the heart of the petroleum industry.

Petroleum production engineering is that part of petroleum engineering that attempts to maximize oil and gas production in a cost-effective manner.

To achieve this objective, production engineers need to have a thorough understanding of the petroleum production systems with which they work. To perform their job correctly, production engineers should have solid background and sound knowledge about the properties of fluids they produce and working principles of all the major components of producing wells and surface facilities

The Petroleum Production System

Production of oil and gas involves two distinct connected systems:

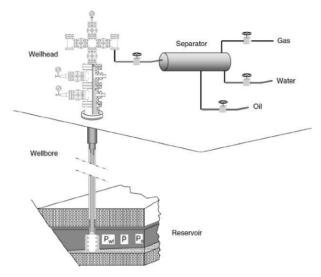
The reservoir, which is the porous medium with unique storage and flow characteristics; and artificial structures, which include the well, the bottom hole, the well had assemblies and the surface gathering, separation, and storage facilities As shown in the Figure below, a complete oil or gas production system consists of a reservoir, well, flow line, separators, pumps, and transportation pipelines. The reservoir supplies wellbore with crude oil or gas.

The well provides a path for the production fluid to flow from bottom hole to surface and offers a means to control the fluid production rate.

The flow line leads the produced fluid to separators.

The separators remove gas and water from the crude oil.

Pumps and compressors are used to transport oil and gas through pipelines to sales points.



The petroleum production system

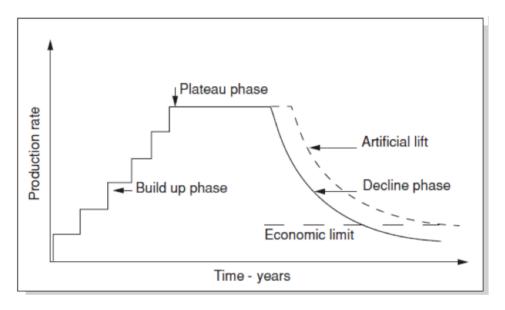
Appropriate production engineering technologies and methods of application are related directly and interdependently with other areas of petroleum engineering, such as formation evaluation, drilling, and reservoir engineering.

Phases of production During the development of the oil field, there are a number of phases. Not all of these phases may be part of the plan.

There is the initial production build up to the capacity of the facility as wells are brought on stream.

There is the plateau phase where the reservoir is produced at a capacity limited by the associated production and processing facilities. Different companies work with different lengths of the plateau phase and each project will have its own duration. There comes a point when the reservoir is no longer able to deliver fluids at this capacity and the reservoir goes into the decline phase.

The decline phase can be delayed by assisting the reservoir to produce the fluids by the use of for example 'lifting' techniques such as down-hole pumps and gas lift. The decline phase is often a difficult period to model and yet it can represent a significant amount of the reserves of hydrocarbon.



The petroleum production system

Phases of production showing the buildup, plateau and decline phases The challenge facing the industry is the issue of the proportion of hydrocarbons left behind.

The ability to extract a greater proportion of the in-place fluids is obviously a target to be aimed at and over recent years recoveries have increased through the application of innovative technology.

Historically there have been three phases of recovery considered. Primary recovery, which is that recovery obtained through the natural energy of the reservoir. Secondary recovery is considered when the energy is supplemented by injection of fluids, for example gas or water, to maintain the pressure or partially maintain the pressure. The injected fluid also acts as a displacing fluid sweeping the oil to the producing wells.

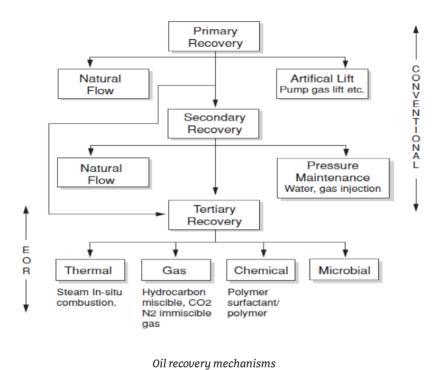
After sweeping the reservoir with water or gas there will still be remaining oil; oil at a high saturation where the water for a range of reasons, for example; well spacing, viscosity, reservoir characteristics to name just a few, has by-passed the oil. The oil which has been contacted by the injected fluid will not be completely displaced from the porous media. Because of characteristics of the rock and the fluids a residual saturation of fluid is held within the rock. Both of these unrecovered amounts, the by-passed oil and the residual oil are a target for enhanced recovery methods, EOR.

Much effort was put into enhanced oil recovery (EOR) research up until the mid seventies. Sometimes it is termed tertiary recovery. When the oil price has dropped the economics of many of the proposed methods are not viable. Many based on forgotten and innovative methods are being investigated within the more volatile oil price arena. Figure 35 gives a schematic representation of the various phases of development and includes the various improved recovery methods.

More recently a new term has been introduced called Improved Oil Recovery (IOR). IOR is more loosely defined and covers all approaches which might be used to improve the recovery of hydrocarbons in place. Clearly it is not as specific as EOR but provides more of an achievable target than perhaps some of the more sophisticated EOR methods.

As we have entered into the next millennium it is interesting to note that a number of major improved recovery initiatives are being considered particularly with respect to gas injection.

One perspective which makes a project more viable is that of the disposal of gas, for example carbon dioxide which is an environmental challenge in one field can be the source of gas for another field requiring gas for a gas injection improved oil recovery process.

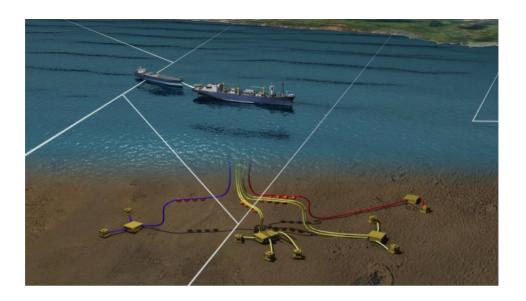


Ghana's oil production

The Kwame Nkrumah FPSO (floating production storage and off loading unit) Kwame Nkrumah MV21 is installed in approximately 1,100 meters water depth on the Jubilee Field, which is one of the largest oil fields discovered offshore West Africa in the past 10 years.

The FPSO is capable of processing more than 120,000 barrels of oil per day, and injecting more than 230,000 barrels of water per day and 160 MMscfd of produced gas.

On November 28, 2010, the FPSO Kwame Nkrumah MV21achieved commissioning of first oil offshore Ghana. The oil from this day has been used to commission the facilities for Tullow's official First Oil Ceremony held on December 15, 2010. The FPSO is designed to remain on the field for up to 20 years.



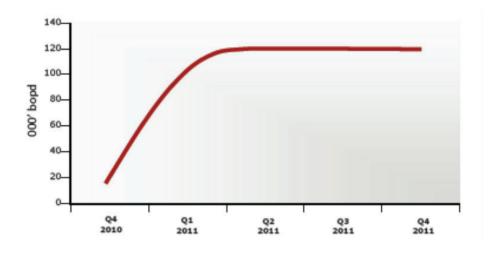
Source: demystifying the oil and gas Industry Ghana by Edward Abrokwah



The Kwame Nkrumah floating production, storage and offloading unit (FPSO), source: http://www.modec.com/fps/fpso_fso/projects/jubilee.html

FPSO receives fluids from the Jubilee field, processes them onboard and offloads the crude oil to awaiting tankers Ghana oil production was predicted at the beginning of the first quarter to rise to 120000 barrels of oil per day; however the facts showed that this target fell short to about 70000 – 80000 barrels of oil (BOPD).

Interactions with industry have revealed that this was due to an inflow performance problem i.e., flow of the hydrocarbons or "oil" from the reservoir into the bottom hole of the well was greatly restricted due to what we call "formation damage" As of present ,the issue of formation damage has been addressed with the use of certain stimulation techniques called acidizing (which uses acid to treat that part of the reservoir around the well bore which has been affected by the damage); to remove this damage and thus increase oil production to about 110,000 BOPD,



The production profile of the Jubilee oil- field showing the peak and plateau production rates over time

FPSO with plateau production of 120,000 bopd Initial production December 2010 .50, 000 bopd Plateau productions to be achieved within 3 6 months as additional wells are connected to FPSO Production wells can flow at around 20,000 bopd

Increasing oil production

Having defined the problem of reduced production and facing the challenges of expanding oil field development to meet Ghana's needs, plans are on the way to increase production of oil thus creating the need for an additional FPSO unit.

The Quality of the Oil

Jubilee crude oil is light and sweet. For oil refiners, lightness and sweetness indicates high quality. Independent laboratory analysis says that the crude oil has an API Gravity of 37.6 degrees and a sulphur content of 0.25 % (weight), with no unusual characteristics. Crude oils of this type are attractive for worldwide refineries and can compete with the international price reference oils. Therefore Jubilee oil will be sold for the official oil price

Dealing with gas production and injection

To avoid flaring gas, the Jubilee partners have developed plans to re-inject the gas into the reservoirs until the infrastructure is in place to receive, process, and transport the gas. Capital costs so far related to gas reinjection is nearly \$600 million. But there is some risk associated with gas reinjection that has to be averted or minimized. The geology of the Jubilee field is such that gas reinjection could reduce oil production in the long term, and/or lead to additional cost in drilling replacement wells or working over existing wells.

Transparency measures

In order to determine the produced quantities of oil for export, the installed and calibrated metering system is used on the FPSO. However, a problem arose with the accuracy of measurement which made export figures seem un-trusted; thus in solving the problem the government announced a replacement of the meter with a high - tech ultrasonic meter.

The Sector Ministry was assuring that the quantities of crude oil in the FPSO storage tanks and in the export tanks were measured using calibrated and accurate portable electronic gauging tapes in the FPSO storage tanks before and after transfer of crude oil to export tankers.

These measurements, together with production volumes measured by metering devices located on each producing well and other parts of the production process, helped to confirm the export quantities. This represents a comprehensive system that enables use of separate yet accurate metering procedures that guarantee accurate measurements, even when any part of the measurement system fails. And that these procedures conform to industry standards for metering facilities and stock tank measurement.

Given the comprehensiveness of the measurement systems that has always been employed at the Jubilee Field, Ghanaians can be assured that Ghana's revenue from the Field is and will always be secure.

The technical description of the FPSO unit

Unit Name	FPSO Kwame Nkrumah MV21
Contract	EPC + Time Charter (Ownership was transferred to the client)
First Oil	December 2010
O&M Period	3 years + 7 one-year options
Client	Tullow Ghana Ltd.
Status	In Operation (MODEC operates)
Field Location	Jubilee Field
Country	Ghana
Water Depth	1,100 m
New/Conv	Conversion
Mooring Type	SOFEC External Turret
Storage Capacity	1,600,000 bbls
Oil Production	120,000 bopd
Gas Production	160 mmscfd
Water Injection	230,000 bwpd

Source: (http://www.modec.com/fps/fpso_fso/projects/jubilee)

ABBREVIATIONS

API Measure of crude oil quality by the American Petroleum

Institute

Bopd Barrels of oil per day

Bwpd Barrels of water per day

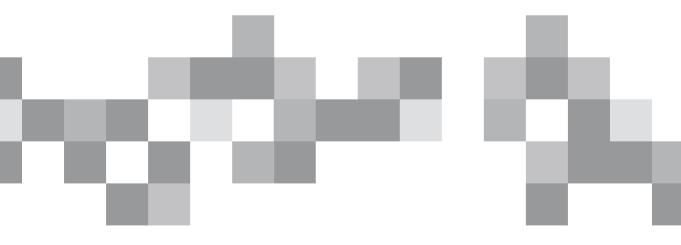
FPSO Floating Production Storage and offloading vessel

Km Kilometers

Mmbo Million barrels of oil

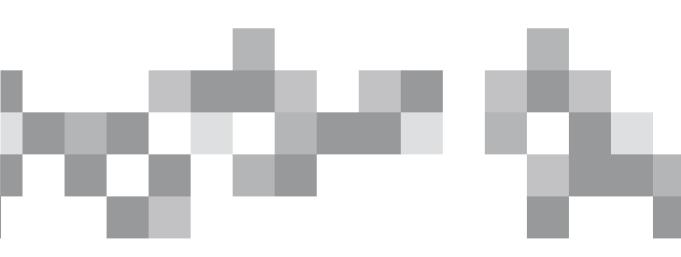
Mmscfd Million standard cubic feet of gas per day





Chapter 6

THE MONEY TRAIL AND THE ECONOMICS OF OIL AND GAS



CHAPTER 6

THE MONEY TRAIL AND THE ECONOMICS OF OIL AND GAS

By // Mohammed Amin Adam ENERGY POLICY ANALYST, EXECUTIVE DIRECTOR, ACEP

Introduction

he economics of oil and gas (petroleum) resources has become the central point from which oil and gas investments projects are evaluated. Oil and gas investments are assessed for their profit potential based on expected revenues and costs. Based on the fiscal regime, profit revenues are shared between investors to compensate for their risks in the project, and the government as the primary resource owner.

In Ghana, commercial oil production commenced in November 2010 but expected revenues have not been realized as a result of production shortfalls and carry forward losses. For example, the Government realized US\$444 million in 2011 against a projected US\$800 million. In 2012, Government received US\$541 million, an improvement on 2011 receipts on account of increased production.

Obviously aware of the dangers associated with poor management of petroleum revenues in other countries, Ghana put in place important mechanisms including a Petroleum Revenue Management law (Act 815) with extensive provisions on transparency and accountability. The law defines the framework for spending and saving petroleum revenues as well as protection measures to check the impact of petroleum revenues on the economy such as "Dutch disease" and crude oil price volatility.

This paper attempts to simplify the fundamental economics of the oil and gas industry to enable journalists understand the "Money Trail" in the industry and be able to track petroleum revenues. Informed analysis and reportage on oil and gas by Journalists will contribute to providing citizens with the right information on the management of Ghana's petroleum wealth. This will also ensure that transparency and accountability become the guiding principles for protecting the petroleum wealth and the interest of the citizens.

Sources of Petroleum Revenues

Petroleum revenues come from different sources. In Ghana, Section 6 of the Petroleum Revenue Management Act 2011 (Act 815) provides that the revenue streams which constitute the gross receipts of the Petroleum Holding Fund are:

- Royalties from oil and gas, additional entitlements, surface rentals, other receipts from any petroleum operations and from the sale or export of petroleum.
- Any amount received from direct or indirect participation of the government in petroleum operation.
- Corporate income tax in cash from upstream and midstream petroleum operation.
- Any amount payable by the national oil company as corporate income tax, dividends, or any other amount due in accordance with the laws of Ghana.
- Any amount received by the government directly or indirectly from petroleum resources not covered by (a) to (d) including where applicable, capital gains tax derived from the sale of ownership of exploration, development and production rights.

From the above, petroleum revenue sources can be summarized as follows:

- Royalties
- Corporate income taxes payable by licensed upstream and midstream operators;
- Participating interest;
- Additional oil entitlements:
- Dividends from the national oil company for Government's equity interest;
- The investment income derived from accumulated petroleum funds;
- Surface rentals paid by licensed producers; or

Any other revenue determined by the Minister to constitute petroleum revenue; derived from upstream and midstream petroleum operations.

Some definitions

- "Royalty" is a percentage of gross production. Cost deductions do not affect royalty. This can be taken in cash or in kind.
- "Carried interest" means an Interest held by the Republic in respect of which the contractor pays for the exploration and development costs without any entitlement to reimbursement from the Republic.
- "Participating interest" means the interest held in petroleum operations by a party to a Petroleum Agreement.
- "surface rental" means fees paid based on the area of the license held.
- "Additional Oil Entitlement" means the portion of a contractor's share of petroleum produced to which the Republic is entitled to a share computed on the basis of the after tax inflation adjusted rate of return that the contractor achieved with respect to each field. This is also called windfall tax or natural resource rent tax.

Tips for Journalists

a. Fiscal Regime

Royalty rate in Ghana ranges between 2.5% and 12%. The royalty rates therefore differ by Petroleum Agreements. In the Jubilee Petroleum Agreements, royalty is fixed at 5% (See Box 1 for royalty rates in different Petroleum Agreements. Corporate Tax rate for petroleum operations is put at 50% in the Petroleum Income Tax. This is however negotiable. For example, in all the Petroleum Agreements signed by the Government of Ghana, the rate has been negotiated to 35%.

Ghana has a carried interest of 10%. However, participating interest includes carried interest and additional paid interest. (See

Box 1 for additional interest in different Petroleum Agreements).

b. Crude Oil Lifting
Lifting of crude oil is based
on the fiscal regime and
governed by Crude Oil Lifting
Agreement (COLA). This
specifies the entitlements
of each party to the contract
and the order of lifting. The
following Table shows the
lifting of crude oil by the
Ghana group in 2012.

Contractor	Royalty Add.	Interest
Kosmos Energy	5%	2.5%
Tullow Oil	5%	5%
Hess Corporation	4%	3.5%
Vitol	12.5%	10%
Challenger AFEX	10%	15%

Date of Lifting of Crude Oil	Volume of Crude Oil (Barrels)	Value of Crude Oil (US\$)
4th January 2012	996,484	111,237,508.92
3rd May 2012	997,636	125,598,381.86
27th July 2012	995,247	89,863,837.37
12th October 2012	947,021	106,592,895.68
12th December 2012	994,646	107,858,417.59

Table 1: Crude Oil Lifting by the Ghana Group

PETROLEUM COST/EXPENDITURE

"Petroleum Costs" is defined as costs incurred in petroleum operations. This consists of capital costs and operational costs. Capital costs include cost with benefits lasting more than a year. Examples of capital costs are cost of producing wells, production facilities, vehicles and vessels, infrastructure, etc.

Operations costs are cost related to production in the current period. Some examples of operation costs are; rentals, service charges, routine maintenance, etc.

Petroleum costs are deducted from revenues generated from petroleum operations to arrive at profit oil. Not all cost/expenses are classified as petroleum costs. Costs that are classified as petroleum costs are allowed for deductions for tax purposes.

Costs allowed for Deductions

Costs/expenses "wholly, exclusively and necessarily incurred in petroleum operations are generally allowed for tax purposes". These include:

- Capital allowance;
- Bad debt:
- Tax losses brought forward from previous years;
- Rental and royalties;
- Interest expenses
- Contribution to a pension or provident fund to the extent that the total contribution by both the employer and the employee does not exceed 25% of the total remuneration of the employee; and
- Training and education of Ghanaian citizens and nationals in approved institutions.

In Ghana's Model Petroleum Agreement, the cost incurred in addressing environmental damage or pollution arising from petroleum operations is also classified as petroleum cost unless it can be proven that the damage or pollution was the result of "gross negligence".

Petroleum Companies sometimes engage in tax planning with the aim of reducing their tax liability. Tax planning involves undue exploitation of loopholes in the tax regime. Some tax planning approaches are legal but others are illegal.

Transfer Pricing

Transfer pricing is the most commonly used by Multi-National Companies. Transfer pricing describes the process by which connected persons set the prices at which they transfer goods or services between each other. In the oil and gas industry, this is done through for example, hiring of rigs from affiliate companies or sale of crude oil to affiliate companies. The prices are either adjusted upwards to justify a claim on higher cost deduction or adjusted downwards to declare lower profits (thus reducing the taxable income).

This practice is not allowed in Ghana as the Ghana Revenue Authority is required under Internal Revenue Act (Act 592) to "adjust transfers between associated enterprises that are not at arm's length, where the prices that an agency or branch charges to its head office, or another related agency or company, do not reflect the prices that are charged among independent companies for similar operations".

Box 2: Crude Oil Quality Measurement

API Degrees	Oil Quality
Greater than 31.10	Light
22.30 - 31.10	Medium
100 - 22.30	Heavy
Sulfer (%)	Oil Quality
Less than 0.5%	Sweet
Greater than 0.5%	Sour

The Government of Ghana reports that the country losses US\$36annually from the mining sector through transfer pricing .To curtail this practice and its implications for government revenues, the Government of Ghana has developed regulations on transfer pricing with a view to detecting the practice and checking it.

Also, to ensure that transfer pricing through crude oil sales is checked, crude oil prices are well defined in the Petroleum Income Tax Law (PNDC Law 188) which also features in all Petroleum Agreements signed between the Government of Ghana and International Oil Operators. Therefore, the market price of crude oil produced in Ghana is defined in three ways:

- a. When oil is sold by the contractor in an "arms-length" commercial oil transaction, the market price is the price realized by the contractor from the sale of the oil.
- b. When oil is not sold by contractor in an arms-length transaction, the market price is the World Market price of comparable oil sold in arms-length transaction and adjusted for oil quality, place of delivery and payment;
- c. When oil is exported by contractor but not sold or supplied to Ghana to meet domestic supply obligations, the price is the World Market price of comparable oil sold in an arms-length transaction, and adjusted for oil quality, place of delivery and payment.

The use of "arms-length" price is positive as it checks transfer pricing by contractors when they sell crude oil to their affiliates.

An "arms-length price" is the price at which two unrelated and non-desperate parties would agree to a transaction. This is most often an issue in the case of companies with international operations whose international subsidiaries trade with each other. For such companies, there is often an incentive to reduce overall tax burden by manipulation of inter-company prices. Tax authorities want to ensure that the inter-company price is equivalent to an arm's length price, to prevent the loss of tax revenue (Read more: http://www.investorwords.com/253/arms_length_price.html#ixzz2QkaGdel1).

^{1.} Budget and Policy Statement of the Government of Ghana (Par 181, Budget 2012)

API Gravity is a measure of oil thickness. It is an index developed by the American Petroleum Institute and
used to measure whether crude oil is light or heavy and is expressed in degrees. The higher the API gravity
(say 38 degrees) the lighter the crude oil; and the lower the Gravity (say 18 degrees), the heavier the crude
oil.

^{3.} The Sulfer content in crude oil indicates the amount of impurities in the oil and thus measures whether the oil is sweet or sour. When the sulfer content is high, the crude oil is sour; and when it is low, the crude oil is sweet. In some cases, particular crude oil grades are both light and sweet (e.g. Bonny light, Jubilee oil).

PRICING MECHANISM

Pricing of crude oil is influenced by several factors. These include demand and supply of crude oil, location of the oil field, quality of crude oil, refinery capacity utilization, and refinery familiarity with crude oil among others.

Crude oil quality differs from one crude oil to the other. Crude oil quality has therefore become a major benchmark for price differentiation. The quality of crude oil is determined by API Gravity or sulfer content.

Whilst all crude oil grades have specific prices (for example Bonny Light Price, Jubilee Oil Price), most of them are benchmarked against international marker prices (with similar quality grades). The most common marker prices are; Brent Crude Oil Price (Brent), and West Texas Intermediate (WTI). Ghana has benchmarked Jubilee oil price to Brent crude oil price. This is because Brent price is the major marker for West African crudes. Moreover, the quality of the crudes is much closer. However, when Jubilee oil sales price is higher than Brent oil price, the difference is a called a "premium". On the other hand, when jubilee price is lower than Brent price, the difference is a "discount".

Tips for Journalists

a. Crude Oil Grades and their Features

Table 2: Crude Oil Type

Crude Oil	Country/Region	API0	Sulfer (%)
Marker Crudes:			
Brent	North Sea	38.5	0.41
WTI	North America	39.6	0.24
Dubai	Middle East	30.4	2.13
African Crudes			
Jubilee	Ghana	37.6	0.25
Bonny Light	Nigeria	32.9	0.16
Agbami	Nigeria	47.2	0.05
Doba	Chad	21.4	0.10
Hungo	Angola	28.3	0.60
Kissanje	Angola	30.7	0.40
Nemba	Angola	39.8	0.22
Qua Iboe	Nigeria	35.2	0.10

b. Comparison between Jubilee Oil Price and Brent Price

In 2011, Jubilee crude oil gained a premium on Brent crude oil price. The average market price of Jubilee for the year was US\$113.075 per barrel; whilst that of Brent Crude Oil was US\$111.26 (International Energy Agency). Thus, Jubilee oil price was higher than its benchmark price by US\$1.815 per barrel. This is referred to as a premium. Even though the premium is small, it could translate to millions of Dollars depending on the quantity of oil produced. For example, in 2011, a total of 66.3 million barrels of crude oil was produced from the Jubilee fields. This means extra revenues of US\$120.3 million assuming all the oil produced was sold at the average price.

The following Table shows the price performance of Jubilee crude oil and Brent.

Table 3: Crude Oil Price Performance (US\$)

Date of Lifting	Jubilee Market price	Brent Price	Premium on Brent
9-Mar	112.804		
25-Jun	116.276		
3-Aug	110.67		
15-0ct	112.55		
Average Prices (2011)	113.075	111.26	1.815

Source: Ministry of Finance and Economic Planning: Quarterly Petroleum Receipts and Distribution Reports.

PETROLEUM REVENUE MANAGEMENT

Ghana's Parliament passed the Petroleum Revenue Management Act (Act 815) in 2011 which defines the framework for petroleum revenue inflows and outflows and clear rules for disbursement. The fiscal model for managing petroleum revenues has three components.

- Allocation to the national Oil Company for financing its equity cost
- Allocation to the Annual Budget of the Government for financing development projects
- Allocation to the Ghana Petroleum Funds for savings and cushioning the budget against crude oil price fluctuations.

These allocations are defined by different terminologies

- Petroleum Holding Fund
- Benchmark Revenue
- Annual Budget Funding Amount
- The Ghana Petroleum Funds

The Petroleum Holding Fund

This is a transitory Fund to which all petroleum revenues are deposited and from which transfers are made to the Budget and Petroleum Funds.

Benchmark Revenue

This is the estimated revenue from petroleum operations expected by the Government for the corresponding financial year. In Section (5) of Schedule 1 of the Petroleum Revenue Management Act, Benchmark Revenue is

Box 3: Fiscal Model for Petroleum Revenue management in Ghana

Benchmark Revenue is total expected petroleum revenues minus the equity financing cost of the National Oil Company minus the share of the net carried and participating interest allocated to the National Oil Company for investments.

Benchmark Revenue is the amount of petroleum revenues that is allocated to the Budget, the Ghana Heritage Fund and the Ghana Stabilization Fund.

According to the Petroleum Revenue Management Act 815, not more than 70% of the Benchmark Revenue shall be allocated to the Budget as the Annual Budget Funding Amount (ABFA). So far, the Government has been allocating 70% of the Benchmark Revenue as the ABFA.

The balance after deducting the ABFA (30% of the Benchmark Revenue) shall be allocated to the Ghana Heritage Fund and the Ghana Stabilization Fund in a ratio of 30:70. That is, 30% of the balance to the Ghana Heritage Fund and 70% to the Ghana Stabilization Fund.

The law further requires that, of the total ABFA, not less than 70% shall be allocated for capital spending. The remaining balance of the ABFA shall be allocated for recurrent spending.

In the case of the Ghana Heritage Fund and the Ghana Stabilization Fund, the proceeds shall be invested in qualifying instruments such as bonds. defined as "the sum of the expected revenue from crude oil, expected gas royalties and the expected dividends from the national oil company".

Calculating the Benchmark Revenue

Expected revenues from crude oil are the product of unit prices of crude oil and quantity of crude oil accruing to the state.

- The Annual Benchmark Revenue shall be calculated on the basis of actual and expected average unit price of crude oil and natural gas derived from a seven-year moving average, the seven years being the four years immediately prior to the current financial year, the current financial year itself and two years immediately following the current financial year.
- The expected quantity of crude oil shall be calculated on the basis of expected

'Collateralization' is the act where a borrower pledges an asset as recourse to the lender in the event that the borrower defaults on the initial loan. Collateralization of assets gives lenders a sufficient level of reassurance against default risk.

Box 4:

average government take in gross oil over a three year horizon. The three years being the immediately preceding, current financial year, and the one year ahead projection following the current financial year.

Potential Abuse of the Benchmark Revenue

As already explained, the benchmark revenue is based on estimates of crude oil prices and production volumes, which could be over-estimated or underestimated. The level of benchmark revenues affects the Annual Budget Funding Amount and the Ghana Petroleum Funds. When the benchmark revenue is overestimated, it triggers two main effects:

- The Annual Budget Funding Amount is not realized, thus creating a shortfall which must be financed from the Ghana Stabilization Fund, a mechanism provided in the Petroleum Revenue Management Act.
- The financing of the shortfall from the Ghana Stabilization Fund depletes the Fund faster and could therefore create a complex legal problem when the Fund is totally depleted in times of volatile revenues.

The letter and spirit of the law could therefore be abused if government

overestimates the benchmark revenue as a way to increase its spending of petroleum revenues.

The Annual Budget Funding Amount (ABFA)

This refers to the amount of petroleum revenue allocated for spending in the budget in the current financial year.

The law provides further that the Annual Budget Funding Amount can be collateralized. In order words, it can be used as collateral for loans contracted by the Government of Ghana

The Ghana Petroleum Funds

The Ghana Petroleum Funds consist of the Ghana Heritage Fund and the Ghana Stabilization Fund.

The Ghana Heritage Fund is to provide an endowment to support development for future generations when petroleum reserves have been depleted. In some countries, it is also called "Future Generations Fund".

The Ghana Stabilization Fund is 'to cushion the impact on the budget or sustain public expenditure capacity during periods of unanticipated petroleum revenue shortfalls". Since crude oil prices are volatile, a fall in the prices could reduce the amount of petroleum revenues to the budget and this could destabilize the planned programme of the Government. The Ghana Stabilization Fund therefore provides a cushion against crude oil price fluctuations.

Revenues allocated to the Ghana Petroleum Funds are expected to be invested in "qualifying instruments".

Tips for Journalist

a. Government not meeting Projections of Revenue

In 2011 and 2012, the Government failed to

Box 5:

Qualifying Instruments (Section 28-29 of Act 815)

The range of qualifying instruments is limited to:

Bonds issued by:

- Sovereign states,
- the IMF and the World Bank

Cash deposits and

bonds denominated in foreign currencies; have an investment grade rating; and issued by:

- Central Banks.
- Bank for International

Settlements

• the European Central Bank

Derivatives that meet the above requirements

meet its projections for petroleum revenues. This affected actual allocations of petroleum revenues to budget and the Ghana Petroleum Funds. The reasons for this development included cost recovery (capital allowance) and losses attributed to the non-recovery of all costs due.

When annual approved costs are not fully recovered from petroleum revenues for the year, the rest (declared as losses) are carried over to the following year for recovery. This is allowed by Ghana's Petroleum Income Tax Law (PNDC Law 188).

Also, when all costs due for recovery in a particular year are not fully recovered, profits are not declared in the particular year, and hence, corporate taxes are not due. This was the case in 2011 and 2012. In 2011, the Government did not get its projected corporate taxes of about GHC603.76 million due to carry forward losses. In 2012, the Government only got US\$40.2 million out of a projected US\$324 million. However, petroleum tax revenues to the Government will increase substantially in future when the full costs of petroleum are fully recovered.

The following Table actual allocations in 2011 and 2012.

Table 4: Allocation of Petroleum Revenues

Item	2011 (US\$)	2012 (US\$)
Benchmark Revenue	236,160,421	310,673,815
Annual Budget Funding Amount	166,955,054	286,554,461
Ghana Heritage Fund	14,400,002	7,235,806
Ghana Stabilization Fund	54,805,353	16,883,548

Source: Budget and Policy Statement of the Government of Ghana (2011, 2012).

b. Low Returns on Investments of Ghana Petroleum Funds

In 2012, revenues allocated to the Ghana Petroleum Funds were invested in Euroclear bonds. The instruments that can be invested in are defined in Act 815 as qualifying instruments.

The qualifying instruments are conservative and low yielding instruments. They are therefore not expected to yield "significantly" higher returns. It must be noted that most of the high yielding instruments in the market are also very volatile (such as equity, housing bonds, etc), the effect of which the law tries to avoid in order to protect the Funds.

The following shows the yield from the investments of the Petroleum Funds so far.

Table 5: Investment Yield from Ghana Petroleum Funds

Petroleum Fund	Net Income (US\$) (Jan – Jun 2012)	Net ROI (%) (Jan – June 2012)	Net Income (US\$) (Jul – Dec 2012)	Net ROI (%) (Jul – Dec 2012)	Average Annual ROI (%) (Jan – Dec 2012)
Ghana	98,835.50	0.18	106,201.90	0.15	0.17
Ghana Heritage Fund	42,174.31	0.29	15,024.41	0.07	0.18
Total	141,009.81	0.24	121,226.31	0.11	0.18

Source: Bank of Ghana – Semi-Annual Report on Petroleum Holding Fund

The Table 5 above shows that the Ghana Petroleum Funds performed better in the first half of 2012 than the second half by 0.5%. This is a negative growth of the Net Return on Investment (Net ROI) in the second half of 2012 over the first half of 2012 (i.e. [0.11-0.24]/0.24 = -0.5).

The total balances of the Ghana Petroleum Funds as at 31st December were as follows:

Table 6: Balances in the Ghana Petroleum Funds

Petroleum Fund	Opening Book Value 1 January 2012 (US\$)	Closing Book Value 31 December 2012 (US\$)
Ghana Stabilization Fund	54,804,352.73	71,898,587.68
Ghana Heritage Fund	14,400,001.62	21,694,221.10
Total	69,205,354.35	93,592,808.78

Source: Bank of Ghana Semi-Annual Report on the Petroleum Holding Fund

The Bank of Ghana has been paid management fees for the management of the Ghana Petroleum Funds. The management fees constitute about 0.01% of the balance in the Ghana Petroleum Funds. In 2012, the total management fees stood at US\$12,051. This is insignificant at the moment but will increase as more revenues flow into the Petroleum Funds requiring significant investment management.

Table 7: Management Fees of the Bank of Ghana (US\$)

Management Fees	Jan – June 2012	July – Dec 2012	Jan – Dec 2012	% of Fund
Ghana Stabi- lization Fund	2,043.20	6,997.77	9040.97	0.01
Ghana Heri- tage Fund	1,281.42	1,728.61	3010.03	0.01
Total	3324.62	8726.38	12,051	0.01

Source: Bank of Ghana – Semi-Annual Report on Petroleum Holding Fund

TRANSPARENCY AND ACCOUNTABILITY

Transparency and accountability are important concepts that should underpin the management of petroleum revenues. Countries that have poorly managed their petroleum revenues are those who also have poor transparency and accountability regimes. In Ghana, progressive transparency and accountability mechanism have been provided in the Petroleum Revenue Management Act to protect the integrity of framework for managing these resources.

One of the unique provisions is the Public Interest and Accountability Committee (PIAC) which was inaugurated on the 15th September 2011.

The Committee has responsibility for:

- Monitoring and evaluating compliance with the Act by the Government and other relevant institutions in the management and use of petroleum revenues,
- Providing a platform for public debate on spending prospects of petroleum revenues in line with development priorities;
- Providing an independent assessment on the management and use of revenues.

As an accountability mechanism, the Committee has elaborate public reporting requirement:

- Publication of a semi-annual report and an annual report by the 15th September and 15th March of each year. This will be posted on the Committee's website, published in daily newspapers, delivered to Parliament and to the President.
- Holding of public meetings at least twice each year to report on its mandate to the general public.

Another important feature of the transparency regime for petroleum revenue management is the role of the Bank of Ghana. Section 28 of Act 815 requires the Bank of Ghana to perform specific functions with respect to Ghana Petroleum Funds. Section 28 (2) of Act 815 requires the Bank to publish two times a year its reports on the Ghana Heritage Fund and the Ghana Stabilization Fund in two stateowned national daily newspapers, but this has not been done.

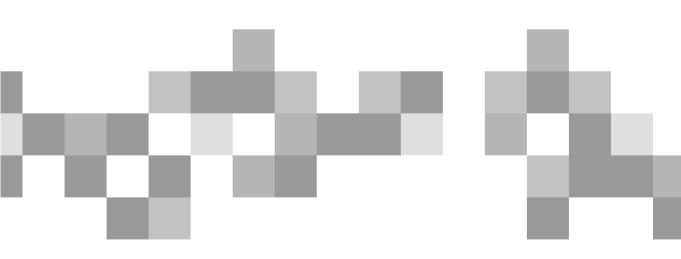
Tips for Journalists

Both the Public Interest and Accountability Committee and the Bank of Ghana have complied with their reporting requirements. The reports can be accessed through the following links:

PIAC Reports: www.piacghana.org. Bank of Ghana Reports: www.bog.gov.gh

Chapter 7

ENVIRONMENTAL HEALTH AND SAFETY MANAGEMENT



CHAPTER 7

ENVIRONMENTAL HEALTH AND SAFETY MANAGEMENT

By // Joe Asamoah, Ph.DOIL AND GAS CONSULTANT,
MD, ENERWISE AFRICA

Introduction

his section is meant to provide the journalist with the appropriate terminology, definitions, risk assessment and simple case studies that will enable him/her to report on Environment, Health and Safety, (EHS) Management issues that are very crucial in any industry, particularly, the oil and gas sector.

Definition

EHS Management

This deals with the management of the activities of an organisation; in order to anticipate and prevent circumstances that may result in occupational injury, ill-health, or adverse environmental impact.

Elements of EHS Management

Environmental Health and Safety Policy

Top management in an organisation is supposed to put in place procedures to define, document, and endorse a formal EHS policy for the organisation. The policy should succinctly outline the roles and expectations for the organisation, faculty, EHS personnel, and individual employees or students.

The EHS policy should state the intent to:

Prevent or mitigate both human and economic losses arising from accidents, adverse occupational exposures, and environmental events;

- Build EHS considerations into all phases of the operations, including laboratory discovery and development environments;
- Achieve and maintain compliance with laws and regulations; and
- Continually improve EHS performance.

The EHS policy and policy statement is supposed to be reviewed, revalidated, and where necessary, revised by top management as often as necessary. It should be communicated and made readily accessible to all employees and made available to relevant interested parties, as appropriate.

Management Commitment

Management commitment to EHS performance is very critical to the success of the EHS programme and to the development of a strong culture of safety within the organization. Examples of how this commitment is supported include the following:

- Establishing methods to use energy more efficiently, reduce waste, and prevent accidents.
- Complying with laws, regulations, and organisational requirements applicable to their operations.
- Improving EHS performance continually.
- Conducting periodic assessments to verify and validate EHS performance.

Planning

Planning forms an integral part of all elements of the management system and to be effective; it must include the design and development of suitable processes and organizational structure to manage EHS aspects and their associated risk control systems proportionately to the needs, hazards and risks of the organization.

Examples of various sources of information that are used to identify applicable EHS aspects and to assess the risk associated with each include:

- Hazard/exposure assessment,
- Risk assessment.
- Inspections,
- Permits.
- Event investigations (injury and illness investigations, environmental incident investigations, root-cause analysis, trend analysis),
- Internal audits and/or external agency audits,
- Fire and building codes,

- Employee feedback concerning unsafe work conditions or situations,
- Emerging issues,
- Corporate/institutional goals, and
- Emergency management.

Once applicable EHS aspects are identified, a risk-based evaluation is performed to determine the potential impact and adequacy of existing control measures. If additional controls or corrective actions are needed to reduce risks to acceptable levels, they are integrated into business planning. Categorising each item in this manner allows gaps that are identified to be prioritized and incorporated, based on the level of importance and available resources.

Implementation

The design of management arrangements should reflect the organisation's business needs and the nature of their risks. However, there should be appropriate activity across all elements of the model (policy; planning; implementation; performance measurement, audits, and change management; and management review).

Specifically the organisation should make arrangements to cover the following key areas:

- Overall plans and objectives, including employees and resources, for the organisation to implement its policy;
- Operational plans to implement arrangements to control the risks identified;
- Contingency plans for foreseeable emergencies and to mitigate their effects (e.g., prevention, preparedness, and response procedures);
- Plans covering the management of change of either a permanent or a temporary nature (e.g., associated with new processes or plant working procedures, production fluctuations, legal requirements, and organisational and staffing changes);
- Plans covering interactions with other interested parties (e.g., control, selection, and management of contractors; liaison with emergency services; visitor control);
- Performance measures, audits, and status reviews;

- Corrective action implementation;
- Plans for assisting recovery and return to work of any staff member who is injured or becomes ill through work activities;
- Communication networks to management, employees, and the public;
- Clear performance and measurement criteria defining what is to be done, who is responsible, when it is to be done, and the desired outcome;
- Education and training requirements associated with EHS;
- Document control system; and
- All those who do business with an Exploration and Production company should have written safety plans, and qualified staff whose qualifications are thoroughly reviewed before a contract is awarded. All contractor personnel should be required to comply with the sponsoring organisation's safety policies and plans.

Though it is the responsibility of each individual researcher to ensure that work is performed in a prudent and safe manner, achieving a safe laboratory environment is a cooperative endeavour between management, EHS personnel, and laboratory personnel. One way to ensure that the needs of all groups are being met is by creating safety committees consisting of representatives from each part of an organisation. In this forum, safety concerns can be raised, information can be distributed to affected parties, and a rough sense of the efficacy of policies and programmes can be gained.

Performance Measurement and Change Management

The primary purpose of measuring EHS performance is to judge the implementation and effectiveness of the processes established for controlling risk. Performance measurement provides information on the progress and current status of the arrangements (strategies, processes, and activities) used by an organisation to control risks to EHS. Measurement information includes data to judge the management system through.

- Gathering information on how the system operates in practice,
- Identifying areas where corrective action is necessary, and

Providing a basis for continual improvement.

All the components of the EHS management system should be adequately inspected, evaluated, maintained, and monitored to ensure continued effective operation. Risk assessment and risk control should be reviewed in the light of modifications or technological developments. Results of evaluation activities are used as part of the planning process and management review, to improve performance and correct deficiencies over time (National Academy of Sciences, 2011).

EPA Develops Guidelines to Regulate Oil and Gas

As part of government's policy to guide petroleum activities in order to follow sustainable development, the Environmental Protection Agency (EPA) has developed guidelines to regulate oil and gas activities in the country. The purpose for these guidelines is to mainstream environmental, health, safety and community issues into the offshore oil and gas operations. These guidelines are intended to assist industry to understand Ghana's environmental assessment process, identify and manage environmental impacts associated with offshore operations, provide industry and government with clarity on the current regulatory requirements (GNA, n.d.).

Apart from the EPA, the Ghana Maritime Authority (GMA) also undertook a number of legislative initiatives in 2011, to support the maritime industry, most especially the emerging oil and gas sector. These initiatives gave rise to the passage by Parliament of some amendments to key legislations as follows:

Ghana Shipping (Amendment) Act, 2011, (Act 826)

This amendment was intended to inject local content into the oil and gas development by encouraging Ghanaians to participate in the shipping activities relating to offshore business. The Ghana Shipping Act, 2003 (Act 645) imposes restrictions on the trading of foreign registered ships in Ghanaian waters by preserving local trade in Ghanaian waters to Ghanaian ships. However, the current definition of Ghanaian waters is limited to the 12 nautical mile territorial

Environmental Impact Assessment

The Environmental Assessment Regulations, LI 1652, was promulgated in 1999 to give complete legal status to the Ghana Environmental Impact Assessment procedures. The Regulations require that all development activities likely

to impact adversely on the environment must be subject to Environmental Assessment. The objective of the LI is to ensure that such development activities are carried out in an environmentally sound and sustainable manner.

In Ghana, Environmental Impact Assessment (EIA) - a planning and a decision-making tool – is required for certain activities, projects, investments, plans, programmes and others whose implementation or development may have major impact.

Main stages in the EIA process are:

- Screening,
- Scoping and
- The actual EIA.

EIA Mandatory List of Energy Undertakings in Ghana Requiring EIA

The following provides a list of undertakings in the Energy Sector – projects, investments, plans, programmes activities, projects, and others that may require EIAs on account of significant impacts during implementation.

- Oil and gas fields
- Oil refineries
- Pipelines
- Storage facilities
- Power generation
- Transmission.

Check Lists for Environmental Impact Assessment Study

- Ecological impact assessment
- Environmental health impact assessment
- Hazard and risk impact assessment
- Noise impact assessment
- Social impact assessment
- Water quality impact assessment
- Air quality impact assessment
- Air quality impact assessment (EPA Ghana, n.d.)

Marine Oil Spills

As soon as oil contacts seawater, the marine environment starts to develop immediately, complex processes of conversion. Under such circumstances, the factors that determine the progression, duration and results of the changes are:

- The constituents of the oil
- The oil spill's parameters, and
- Environmental conditions

The characterisation of oil transformations is undergirded by their dynamism, largely in the initial stages, the closeness of the interactions of physical, chemical and biological systems of degradation and dispersion of oil constituents till they disappear as original substances.

Whenever a marine ecosystem encounters oil spill, the former undergoes the following:

- Destruction
- Metabolism
- Offloading of excessive amounts of hydrocarbons

These occur to change them into comparatively safe and common substances. The distribution of spilled oil in the sea is influenced by gravitational forces. However, the distribution is controlled by the viscosity and surface tension of water.

Self-Purification

Due to the dynamic forces and the transformations that take place, oil in the marine environment quickly loses its original properties and fragments into hydrocarbon fractions. These fractions, which exist in a myriad of migrational forms, have varied chemical composition and structure (Asamoah, 2012).

Impact of Oil Spill on the Marine Ecosystem

Environment, health and safety issues are interrelated. It is common that what starts as an environmental challenge, soon develop into safety and health issues.

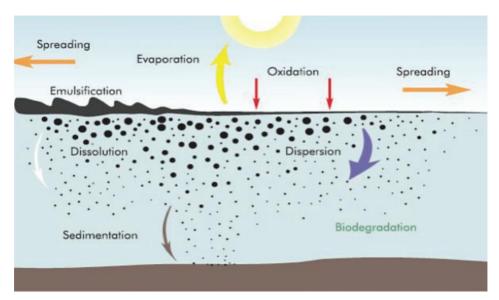


Figure 1 below gives an overview of transformation that occurs during a marine oil spill.

Figure 1 Transformation that Takes Place during Marine Oil Spills

Courtesy: Ports and Maritime Organisation (2012 Legend: The arrows show the trajectory of the processes.

Ecological Impacts of Oil Spills

Generally, oil spills have short and long-term environmental damage, and its effects may remain on for decades after the spillage. The following provides some of incidences of the impact of marine oil spills:

- Effect on Beaches, Marshlands and Fragile Marine Ecosystems
- Endangering the Lives of Birds
- Endangering the Lives of Marine Mammals
- Fish Fatality
- Devastation of Wildlife Habitat and Breeding Grounds (Asamoah, 2012)

Emergency Response System

The following may be established, when an oil spill occurs offshore:

- Establishment of a unified command structure
- · Setting up a communication system, and
- Embarking on a full-scale oil recovery operation at the site of the accident, including actual deployment of oil containment booms and skimming equipment.

Remediation of Polluted Soil

The following three processes may be used to restore soils polluted by an oil spill

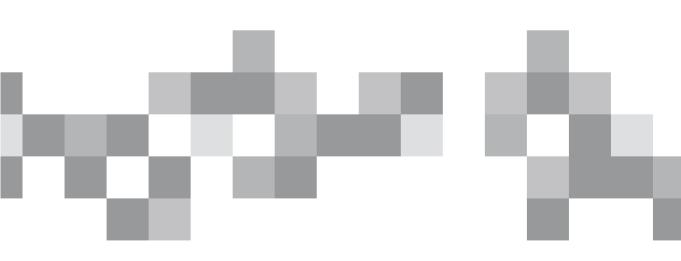
- Physical-chemical (shallow soil mixing, oxidation-reduction, hydrolysisneutralization, stabilization-solidification, mobilization-immobilization, soil flushing-washing)
- Thermal (heat to increase the volatility, to burn, decompose, destroy or melt the contaminants), and
- Biological (bioventing, bio-purging, hydraulic-pneumatic fracturing, soil bio-injection, air and water flushing, biopolymer shields and phytoremediation)

Tips for Journalists

The issue of which method should be applied in oil polluted lands depends on the chemical, physical and biological properties of both contaminant and soil source. Generally, physical methods, such as stripping or sorption, are not as effective as biological methods for treating hazardous organic compounds (Knox et al, 1986).

Chapter 8

COMMUNITY RELATIONS IN THE OIL AND GAS SECTOR



CHAPTER 8

COMMUNITY RELATIONS IN THE OIL AND GAS SECTOR

By // Frederick Asiamah

AWARD WINNING ENVIRONMENTAL JOURNALIST

ommunity Relations (CR) is one area with huge story potentials. It simply refers to the mechanics of engagement between an establishment and a community (host). Usually, it is driven by the establishment or company and often embedded in its Public Relations (PR) or Corporate Affairs policy or programme. Sometimes, CR may be viewed as a minuscule PR but Firms consider it as very crucial.

Community Relations defined

In more elaborate terms, CR has many definitions. Within the context of this handbook, however, CR is defined as Firms' interactions with the people constituting the environment it operates in and draws resources from, to foster mutual understanding, trust, and support (BusinessDictionary.com, 2013). In other words, CR refers to the relationship that a company, organization, etc. has with the people who live in the area in which it operates (Cambridge Dictionaries Online, 2013).

The place of the Media in Community Relations

Firms or establishments do not carry out their CR activities out of the vacuum. There is always a goal. Ultimately, a firm seeks a healthy environment within which to operate. It seeks to avoid confrontation and "badmouthing", and to gain the trust of the community and other stakeholders. The absence of trust could affect the image and operations of the organisation/firm. Thus, CR activities of a firm may often be rigorous but at the same time ad hoc.

Examples from the Niger Delta region of Nigeria show that oil firms maintain contacts with communities through community relations committees or community liaison officers (Social Development Integrated Centre, 2010).

Within the extractive industry, the media is considered to be very central to the success of CR from the perspective of firms as well as civil society actors seeking to promote the rights of communities. While firms strive to maintain a good relationship with their hosts, Civil Society is always on the lookout for whether the activities of the firms undermine the rights and privileges of the host communities. At the same time the host community is weighing the benefits and constraints of the operations of the firm.

In this instance, the journalist is always seen as the first arbiter. Dissatisfied members of the host community (usually being coached by a Civil Society Organisation or experienced opinion leader) will head towards the media to air their grievances even before seeking redress from mandated institutions. Their grievances may be communicated through press statements or press conferences. Their statements may, sometimes, be lob-sided and confusing but tempting for the journalist who is on the lookout for a scoop. The journalist may even ignore the basic journalistic rule of cross-checking with the firm and hearing their side of the story.

Stiglitz and Schiffrin (2004) explain the difficulty the journalist is put in:

When journalists are on deadline and writing about topics that are unfamiliar to them, it is all too easy to take the nearest press release and repeat it verbatim. The Problem is that those who devote resources to public relations usually have a motive for doing so. They typically want to convince others to support the positions that they advocate. But too often reporters take press releases as "facts" rather than as "advocacy."

This means journalists require help to carry out effective, unbiased reporting of CR activities in the Oil and Gas sector.

Key areas for reporting Community Relations

All the general journalism rules apply in the coverage of CR. However, the reporter covering CR must know the following key concepts: Social Licence, Community Interest and Concerns, Livelihoods, Compensation, and the matter of Valuation (of lands, landed property, crops, etc).

Learning, knowing about and looking out for these areas makes it easy for journalists to pitch stories.

1. Social Licence

Social Licence is one of three licenses for establishing the presence of social justice in the management of Oil and Gas resources (Adam, 2012). It is consummated between the firm and society to allow for resource extraction.

The key points for journalists to note are that:

- Social Licence is the kind of clearance a company, firm or establishment needs from a community (and sometimes citizens' groups) or its immediate environment to operate successfully.
- Unlike other licences, Social License is unwritten or undocumented but it is the crux of CR.
- Social License is said to be obtained when a community accepts or is satisfied with a company's behaviour.
- Employee dissatisfaction, human rights abuses, environmental degradation and destruction of people's livelihoods by firms – whether intentionally or unintentionally – could affect Social Licence.
- The absence of Social Licence is mostly manifested in strained relationships between firms and their hosts.

2 Community Interest and Concerns

Community Relations strategies may be designed in anticipation of, or in response to several Community Interests and Concerns

The Journalist's CR Cross

It is thought that covering CR in the Oil and Gas sector (and many other extractive sectors) is as complex as the industry itself, making it a banana peel for journalists. It becomes even more problematic for a journalist when the community perceives that a firm is engaging them only for subtle, ill-motivated and selfseeking reasons. They will overturn CR on its head, developing their own strategy. Journalists have tough tasks under such circumstances.

The journalist who is not careful then becomes scapegoat for heightening unrealistic expectations.

which are frequently expressed in the form of demands. Therefore, covering Community Interest and Concerns is made easy when Journalists pay attention to community demands, such as:

- Opportunities for participation in industry activities;
- ■. Protection of their livelihoods;
- Preservation of their environment, including water bodies;
- Protection of traditional heritage sites and artefacts, including cemeteries;
- Respect for traditional hierarchy

3 Livelihoods

Livelihoods refer to the income-generation activities that inhabitants of a community engage in prior to, during and after a resource extraction firm's operation in their area. There are two types: traditional and alternative livelihoods.

- Traditional livelihoods: These are the livelihood activities which communities were engaged in before the arrival of Oil and Gas establishments. These activities may include agriculture (crop cultivation), fishing, livestock rearing, poultry farming, gaming and wildlife, etc. For example, since the discovery of oil in the Western Coast of Ghana, fishermen have reportedly had challenges with fishing in the same manner they used to do.
- Alternative livelihoods: These refer to substitute livelihood activities proposed for communities after their traditional livelihoods have been affected by operations of Oil and Gas establishments. Examples from Ghana's mining sector show that usually people would be offered training in dressmaking, hairdressing, grasscutter rearing, etc.

The quest for satisfactory Livelihood options usually becomes a source of conflict if people disagree with or are dissatisfied with alternatives. This can be a basis for communities to withdraw a firm's Social Licence.

4 Compensation

Compensation is arguably the biggest source of conflict in resource-rich or fringe communities. It is also one of the most frequent areas of focus by the media as was the case in the Jomoro District where coconut plantations were felled to pave way for pipeline laying in the construction of a Gas Processing Plant.

In Ghana, the principal guide to compensation payment is the Constitution

(1992). In Article 20 (2), the Constitution provides that "Compulsory acquisition of property by the State shall only be made under a law which makes provision for- (a) the prompt payment of fair and adequate compensation; and (b) a right of access to the High Court by any person who has an interest in or right over the property whether direct or on appeal from any other authority, for the determination of his interest or right and the amount of compensation to which he is entitled.

In addition, Article 20(3) provides that "Where a compulsory acquisition or possession of land affected by the State...involves displacement of any inhabitants, the State shall resettle the displaced inhabitants on suitable alternatives land with due regard for their economic well-being and social and cultural values.

This is supported by Section 24(3) of the Petroleum Revenue Management Act, 2011 (Act 815) which stipulates that "Where petroleum operations adversely affect a community, appropriate compensation shall be paid for the benefit of the community in accordance with the relevant laws."

From the foregoing, the principal entity that compensates is the State but acting through the Ghana National Petroleum Corporation (GNPC) which represents the State's interest. Also, firms which hold oil and gas contracts will directly be responsible for compensation if the terms of their contracts so provide.

The laws as they exist presently are not explicit but provide adequate inferences on the principles for compensation. Coupled with best practice and lessons from the minerals sector, the following principles of compensation present adequate guidance to journalists:

- There must be independent valuation of property acquired
- State/firm should draw and discuss resettlement plan where displacement of communities/persons occurs
- Negotiation of compensation and resettlement between State/firm and community/persons, including alternative livelihoods
- Unhindered access to court in cases where affected persons disagree with outcome of compensation negotiation
- Prompt payment of compensation
- Implementation of resettlement plan

Valuation

Generally, acceptance of compensation levels would depend on satisfaction with value placed on property and livelihoods which have been affected. Here again, journalists can draw lessons from reforms in the mining sector regarding how independently and comprehensively a valuation process must be (Niber, 2012).

Important points to note are that a comprehensive compensation valuation process must take into account:

- Loss or deprivation of the use of natural surface of the land (or sea in the case of offshore operations)
- Inconveniences caused to a land owner/occupier
- The loss or damage to immovable properties and their appurtenances

Important tips

For effective coverage of Community Relations, journalists should:

- Assess teamwork
- Check community relations office notice boards
- Look out for power relations. For instance, who holds influence in the community?
- Identify the possible conflict triggers in the

- community
- Identify the existence or otherwise of a Social Licence.
- Inquire about traditional sources of livelihood of the community
- Investigate sustainability of alternative livelihood options
- Assess how well compensation and valuation principles were adhered to
- Eschew sentimentalism.

APPENDIX I

Following the trend of prevailing technology discovery of oil and gas in Ghana and other African countries are indicated below. Phase I- mid 1950s

First oil discovered in Algeria, Nigeria, Cameroun, Gabon, Congo and Angola Phase II -1970s

Discoveries in Chad, Niger, Ethiopia, Sudan, Tunisia and offshore Egypt and Ghana (Saltpond)

Phase III -1990s

Discoveries in deepwater plays in Mauritania, Nigeria, Equatorial Guinea Angola and Nile- delta of Egypt and Ghana

Phase IV Present phase

2000 and to the present, a third of the world's discoveries are from Africa,

APPENDIX II

SUCCESS STORIES IN GHANA

1970 Tano 1-1 North Tano oil and gas field discovered by Volta Petroleum Company

1970 Saltpond oilfield, operated by Signal/Amco group developed and produced by Agripetco at initial rate of 4,800 BOPD in 1978 till 1985; production recommenced in 2002 and @ 700 BOPD

1978 South Tano: 1s-1X discovered oil and gas by Phillips Petroleum; 1S-3Ax discovered gas and condensate in satellite structure

1987 WAOFCO -2 First oil discovered by West Africa oil and fuel Company flowed about 5 BOPD

WT-1XWCTP-2X; WT -1X flowed 750 BOPD in camparian sands, WCTP -1X recovered 37 API (American Petroleum Institute degree values) oil in 14 ft of pay

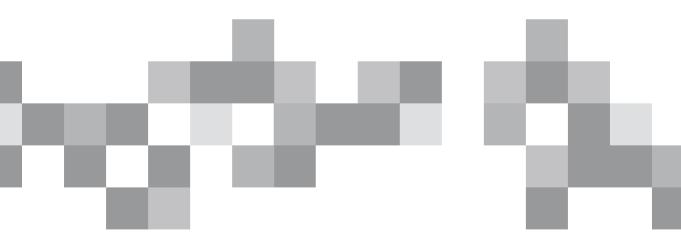
2007 Jubilee field discovered by a Consortium of Companies-Tullow Oil plc, Kosmos Oil GH Limited, Anardarko, EO group

2007 more discoveries are made around the Jubilee in South Tano oilfiled

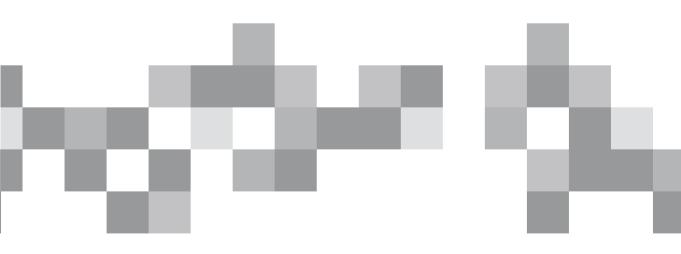
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PROFILE

This handbook is one of the key building blocks of Penplusbytes' "Empowering the Media to Play an Active Watchdog Role over Ghana's Oil and Gas Revenues and Resources" project with funding and technical support from STAR-Ghana. The project aims to improve the coverage of oil and gas stories by the Ghanaian media leading to an increase in the quantity and quality in terms of in-depth and investigative reporting.

The handbook's main objective is to empower journalists and other stakeholders with an information and knowledge resource to enable them play an effective watchdog role in Ghana's oil and gas revenues and resources.

It provides information on a chronology of events in the oil and gas Industry, the geopolitics of the sector, legal and regulatory framework governing the sector, licensing and contracts, the money trail & the economics of Ghana's oil and gas as well as information on safety, health, environment and community relations.



