

An Illustrated Glossary Of Selected

OIL AND GAS TERMINOLOGIES



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OIL AND GAS TERMINOLOGIES**

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PREFACE

The emerging Oil and Gas Industry in Ghana is a highly specialized industry, one replete with industry-specific jargons that can be very difficult to understand by or explained to industry 'novices'. Yet it is one industry where various non-technical actors have a stake and are expected to be involved in its governance.

This glossary has been put together to serve as a quick reference material for all stakeholders who are desirous to gain basic insight and understanding into the technicalities and workings of the fledgling industry. It is by no means exhaustive but a compilation of selected terminologies that are commonly used in the oil and gas industry, especially those that have been used in official documents/reports on the nascent industry. Where possible, pictorial illustrations have been included to help user better understand the definitions provided.

The glossary has been prepared by the Kumasi Institute of Technology and Environment (KITE) on behalf of the Oil and Gas Stakeholders Network (OGSN) as part of the Oil and Gas Sector Research and Advocacy Project (OGSRAP). The goal of the OGSRAP is to work with the Ghanaian legislature and other stakeholders such as the media and civil society organizations to promote the institutionalization and practicing of the ideals of good governance in Ghana's oil and gas industry.

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The electronic copy of the glossary can be downloaded at www.kiteonline.net/oilandgasglossary



Abandonment

1. The proper plugging and abandoning of a well in compliance with all applicable regulations, and the cleaning up of the wellsite to the satisfaction of any governmental body having jurisdiction with respect thereto and to the reasonable satisfaction of the operator.
2. To cease efforts to find or produce from a well or field.
3. To plug a well completion and salvage material and equipment.

Additional Oil Entitlement

Represents an additional or windfall profits tax to the state when the project's actual internal rate of return exceeds the targeted rate of return used to evaluate the profitability of the venture.

Appraisal Drilling

1. Drilling to determine physical extent, reserves and likely production rate of a reservoir, together with properties of oil or gas.
2. Drilling to determine the amount of petroleum and possible production rate of the reservoir, together with properties of oil or gas.

Appraisal Well

A well drilled as part of an appraisal drilling program which is carried out to determine the physical extent, reserves and likely production rate of a field.

Associated Gas

A natural gas found in contact with or dissolved in crude oil in the reservoir.

Barrel

A unit of volume measurement used for petroleum and its products (7.3 barrels = 1 ton; 6.29 barrels = 1 cubic meter).

bbbl

One barrel of oil; 1 barrel = 35 Imperial gallons (approx.), or 159 litres (approx.); 7.5 barrels = 1 ton (approx.); 6.29 barrels = 1 cubic meter.

bcf

Billion cubic feet; 1 bcf = 0.83 million tons of oil equivalent.

bcm

Billion cubic meters (1 cubic meter = 35.31 cubic feet).

Behind - Pipe Reserves

Reserves expected to be recovered from zones in existing wells, which will require additional completion work or future recompletion prior to the start of production.

Block

The demarcation of a country's oil exploration and production areas into segments. Ghana's sedimentary basins are divided into quadrants and blocks. A quadrant is 1 degree latitude by 1 degree longitude (Continue overleaf)

Blow - Down

Blow- Out

**Blow- Out
Preventer**

Boom - Bust Cycle

bpd

and is divided into 18 blocks of 680 square kilometers (422 square miles) each. The maximum area an investor can apply is 3,000 square kilometers by policy but may be larger in practice.

Condensate and gas is produced simultaneously from the outset of production.

An uncontrolled flow of high pressure gas, oil or other fluids from a well.

Are high pressure wellhead valves,

designed to shut off the uncontrolled flow of hydrocarbons.



Blow-Out Preventers

Refers to a great build-up in the price of a commodity (in this case oil) or, alternatively, the localised rise in an economy, often based upon the value of a single commodity, followed by a downturn as the price of the commodity falls due to a change in economic circumstances or the collapse of unrealistic expectations.

Abbreviation for barrels per day.

Capping

Tightly closing a well so that hydrocarbons cannot escape.

Carried Interest

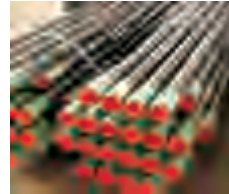
An agreement under which one party (the carrying party) agrees to pay for a portion or all of the pre-production costs of another party (the carried party) on a license in which both own a portion of the working interest.

Carrier Beds

These are coarser-grained and more permeable rocks that hydrocarbons are expelled into during primary migration.

Casing

Pipe cemented in an oil well to seal off formation fluids or keep the hole from caving in.



Casing

Casing Head

Top of casing set in well. Part of casing that protrudes above surface and to which control valves and flow pipes are attached.



Casing Head

Casing Seat

The lowest point at which casing is set.

Casing String

Christmas Tree

Clean Out

Commercial Field

Company Man

The steel tubing that lines a well after it has been drilled. It is formed from sections of steel tube screwed together.

The assembly of fittings and valves on the top of the casing which control the production rate of oil.



Christmas Tree

To remove sand, scale and other deposits from the producing section of the well to restore or increase production.

An oil and/or gas field judged to be capable of producing enough net income to make it worth developing.

In a normal scenario, gas/oil-drilling (exploration) companies rent or lease rigs from another company that owns the rig, the drilling contractor. The majority of the rig crew are employees of the drilling contractor. The Company Man is the on-site representative of the operating/exploration company and is in overall charge of the drilling and associated activities. Other terms that may be used are company representative, foreman, drilling engineer, company consultant,

Completion

rigsite leader or "well site manager".

Condensate

The installation of permanent wellhead equipment for the production of oil and gas.

Corporate Social Responsibility

Hydrocarbons which are in the gaseous state under reservoir conditions and which become liquid when temperature or pressure is reduced. A mixture of pentanes and higher hydrocarbons.

Crude Oil

Describes the voluntary role private companies play in the national development agenda.

Cubic Foot

Liquid petroleum as it comes out of the ground as distinguished from refined oils manufactured out of it.

Deep - Water Discovery

A standard unit used to measure quantity of gas (at atmospheric pressure); 1 cubic foot = 0.0283 cubic meters.

An offshore discovery located in at least 200 metres of water.

Derrick

Derrickhand or Derrickman

Development Area

An oil derrick is a drilling rig designed for use in oil and natural gas production. The basic oil derrick has an upright stationary section which is potentially capable of

supporting hundreds of tons of weight combined with a movable boom which is used to raise and lower equipment. It is used for lifting and positioning the **drilling string** and piping above the well



Derrick

bore, and containing the machinery for turning the drilling bit around in the hole. It also controls the weight on the drilling bit.

A rig crew member who handles the upper end of the drill string as it is being hoisted out of or lowered into the hole. They operate from on top of the derrick (on the 'monkey board') and guide the stands of drill pipe into the fingers at the top of the derrick while tripping (removing the drill string) out of the hole. When tripping into the hole they pull the pipe out of the fingers and guide it into the top drive or the elevators.

An area constituted by a block that is subject to petroleum exploration and production licence.

Development Operations

Development Phase

Discovery Area

Downstream

Drill Cuttings

Operations carried out in or for the purpose of producing petroleum.

The phase in which a proven oil or gas field is brought into production by drilling production (development) wells.

The block or blocks in an exploration area comprising the geological features as outlined by the relevant geological or geophysical data in which a discovery is located.

The segment of the oil and gas value chain that deals with the refining, distribution and marketing of petroleum products. The downstream sector includes oil refineries, petrochemical plants, petroleum product distribution, retail outlets and natural gas distribution companies.

Chips and small fragments of drilled rock that are brought to the surface by the flow of the drilling mud as it is circulated.



Drill Cuttings

Drill Pipe

Heavy, thick-walled, hollow steel pipe used in rotary drilling to turn the drill bit and to provide a conduit for the drilled mud.



Drill Pipe

Driller

Drilling crew member in charge of a specific drilling or workover crew. The driller's main duty is the operation of the drilling and hoisting equipment, but this person may also be responsible for downhole condition of the well, operation of downhole tools and pipe measurements.

Drilling

The process of perforating the earth surface or ocean bed using a boring mechanism to find and extract a subsurface fluid such as oil and gas.

Drilling Bit

The cutting or boring element used in drilling oil and gas wells. The bit consists of the cutting elements and the circulating element. The circulating element permits the passage of drilling fluid and the hydraulic force of the fluid stream to improve drilling rates.



Drilling bit

Drilling Contractor

Drilling Fluid/Mud

An individual or group of individuals that own a drilling rig and contract their services.

Any of a number of liquid and gaseous fluids and mixtures of fluids and solids (as solid suspensions, mixtures and emulsions of liquids, gases and solids) used in operations to drill boreholes



Drilling Fluid/Mud

into the earth. It is used to control subsurface pressures, lubricate the drill bit, stabilize the well bore, and carry the cuttings to the surface, among other functions.

Drilling Rig

A drilling unit that is not permanently fixed to the seabed, e.g. a drillship, a semi-submersible or a jack-up unit.



Drilling Rig

Drilling String

A hollow column or string of drill pipe that submits drilling fluid and rotational power to the drill bit. The term is loosely applied as the assembled collection of the drill pipe, drill collars, tool and drill bit.



Drilling String

Dry Gas

Natural gas composed mainly of methane with only minor amounts of ethane, propane and butane and little or no heavier hydrocarbons in the gasoline range.

Dry Hole

An oil well which has proved to be non-productive.

Dutch Disease

An economic concept that tries to explain the apparent relationship between the exploitation of natural resources and decline in the manufacturing and other sectors of the economy combined with moral fallout.

EIA

Abbreviation for Environmental Impact Assessment.

EIS

Abbreviation for Environmental Impact Statement – a statement required by the Environmental Protection Agency under the Ghana Environmental Assessment Regulation of 1999 in relation to any action significantly affecting the environment, including exploration and drilling activities.

EITI

Abbreviation for Extractive Industries Transparency Initiative. It is a global standard for transparency in revenues from oil, gas and mining industries. EITI centres on two core mechanisms. First, it requires that companies disclose their payment made to government and government disclose their revenue received from companies. Second, it requires that an independent administrator reconciles these figures under the management and supervision of a multi-stakeholder committee.

E&A

Abbreviation for Exploration and Appraisal.

E&P

Abbreviation for Exploration and Production.

Enhanced Oil Recovery

A process whereby oil is recovered other than by the natural pressure in a reservoir.

Exploration

Includes the undertaking of any activity for the purpose of the discovery of petroleum using geological, geophysical geochemical and geotechnical surveys, exploration drilling and appraisal drilling.

Exploration Area

An area constituted by a block that is subject to a petroleum exploration licence.

Exploration Drilling

Drilling carried out to determine whether hydrocarbons are present in a particular area or structure.

Exploration Operation

The phase of operations which covers the search for oil or gas by carrying out detailed geological and geophysical surveys, followed where appropriate, by exploratory drilling.

Exploration Well

A well drilled in an unproven area. Also known as a "wildcat well".

Facility

An installation, plant, pipeline and other equipment for petroleum activity.

Fiscal Regime

Refers to the agreement between a state and an oil and gas exploration company to develop and extract hydrocarbons.

Flow Test

An operation on a well designed to demonstrate the existence of moveable petroleum in a reservoir by establishing flow to the surface and/or to provide an indication of the potential productivity of that reservoir.

FPSO

Abbreviation for Floating Production, Storage and Offloading – a floating tanker or vessel used for the production of oil and gas in an offshore oil field. FPSOs usually



FPSO

consist of large monohull structures, generally (but not always) ship-shaped, and equipped with processing facilities. They are moored to a location for extended periods.

Fuel Gas

Gas used for field and plant operations.

Gas Injection

The process whereby separated associated gas is pumped back into a reservoir for conservation purposes or to maintain the reservoir pressure.

Gas/Oil Ratio

The volume of gas at atmospheric pressure produced per unit of oil produced. It is estimated by dividing the total gas produced by the oil production volume.

Geologist

A scientist who studies the solid and liquid matter that constitutes the Earth and terrestrial planets. Geologists usually engage studying geology, and approach this using physics, chemistry and biology as well as other sciences.

Geology

The science and study of the solid and liquid matter that constitutes the Earth. The field of geology encompasses the study of the composition, structure, physical properties, dynamics, and history of Earth materials, and the processes by which they are formed, moved, and changed.

Gone To Water

Pertaining to a well in which production of oil has decreased and production of water has increased.

Government Take

The percentage of all payments to Governments, over the life of a project, as a portion of the cash flows that remain after all project capital investment and operating costs have been paid. Government take can include royalties, taxes, profit petroleum share, bonus payment, state oil company carries, etc.

Hydrocarbon

A compound containing only the elements hydrogen and carbon. May exist as a solid, a liquid or gas. The term is mainly used in a catch-all sense for oil, gas and condensate.

Hydrocarbon Trap

The region beneath the seal that contains the trapped hydrocarbons at high concentrations.



Hydrocarbon Trap

Injection

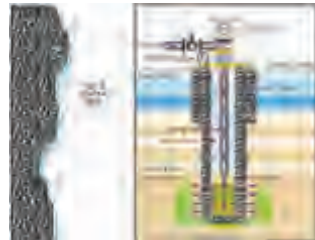
The forcing or pumping of substances into a porous and permeable subsurface rock formation.

Injection Water

Water that is introduced into a reservoir to help drive hydrocarbons to a producing well.

Injection Well

A well used for pumping water or gas into the reservoir.



Licence

A permit to search for and produce oil and gas. These permits can also be called concessions, agreements or permits depending on the country in question. In Ghana, they are usually called petroleum agreements. *(continue overleaf)*

Liquefied Natural Gas

A licence usually consists of two parts: an exploration permit and a production permit.

Liquefied Petroleum Gas

Oilfield or naturally occurring gas, chiefly methane, liquefied for transportation.

Local Content And Participation

Light hydrocarbon material, gaseous at atmospheric temperature and pressure, held in the liquid state by pressure to facilitate storage, transport and handling. Commercial liquefied gas consists essentially of either propane or butane, or mixtures thereof.

Mboe

Government policy intended to maximize national value creation from petroleum resources through generating employment opportunities, adding value and gaining access to technology and knowledge. The GNPC has defined the term as 'the level of use of Ghanaian local expertise, goods and services, people, businesses and financing in oil and gas'.

Mid-Stream

Million Barrels Oil Equivalent.

Mmcfd

Includes petroleum activities between the well-head and refinery, transportation and storage of petroleum.

Millions of cubic feet per day (of gas).

**Mud Engineer/
"Mud Man"**

A member of rig crew tasked with the responsibility of ensuring that the properties of the drilling fluids (also known as 'drilling mud') are within designed specification.

**Non - Recoverable
Reserves**

That proportion of the oil and/gas in a reservoir that cannot be removed using currently available techniques.

O & G

Oil and Gas.

Oil

A mixture of liquid hydrocarbons of different molecular weights.

Oilfield

A geographic area under which an oil reservoir lies. Eg. Jubilee Field.

Oil In Place

An estimated measure of the total amount of oil contained in a reservoir, and, as such, a higher figure than the estimated recoverable reserves of oil.

Operator

The company that has legal authority to drill wells and undertake the production of hydrocarbons that are found. The Operator is often part of a consortium and acts on behalf of this consortium.

Payzone

Rock in which oil and gas are found in exploitable quantities.

Permeability

The property of a formation which quantifies the flow of a fluid through the pore spaces and into the wellbore.

Petroleum

A generic name for hydrocarbons, including crude oil, natural gas liquids, natural gas and their products.

Petroleum Deposit

An accumulation of petroleum in a geological unit, limited by rock characteristics by structural or stratigraphic boundaries, contact surface between petroleum and water in the formation, or a combination of these, so that all the petroleum comprised everywhere is in pressure communication through liquid or gas.

Petroleum Production

The production of petroleum, including drilling of production wells, injection, improved recovery, treatment and storage of petroleum for transport, and shipment of petroleum for transport by ship, as well as the construction, placing, operation and use of a facility for the purpose of production.

Plugging

Process whereby a well that is no longer needed is filled with concrete and abandoned.

Porosity

The percentage of void in a porous rock compared to the solid formation.

Possible Reserves

Those reserves which at present cannot be regarded as 'probable' but are estimated to have a significant but less than 50% chance of being technically and economically producible.

Primary Migration

The movement of hydrocarbons just after their formation in the source rocks until they reach the more permeable rocks.

Primary Recovery

Recovery of oil or gas from a reservoir purely by using the natural pressure in the reservoir to force the oil or gas out.

Probable Reserves

Those reserves which are not yet proven but which are estimated to have a better than 50% chance of being technically and economically producible.

Production Sharing Contract

It is an agreement between the parties to an oil well and host country government regarding the percentage of production each party will receive after the participating parties have recovered a specified amount of costs and expenses. It is a contractual system of petroleum fiscal
(continue overleaf)

Project

regime, in which companies have the right to receive a share of production or revenues from the sale of oil and/or gas in accordance with production sharing contract or a service contract.

The link between the petroleum accumulation and the decision-making process, including budget allocation. A project may, for example, constitute the development of a single reservoir or field, or an incremental development for a producing field, or the integrated development of a group of several fields. In general, an individual project will represent the level at which a decision is made on whether or not to proceed (i.e. spend money).

Proven Field

An oil and/or gas field whose physical extent and estimated reserves have been determined.

Proven Reserves

Those reserves which on the available evidence are virtually certain to be technically and economically producible (i.e. having a better than 90% chance of being produced).

Recovery Factor

That proportion of the oil and/gas in a reservoir that can be removed using currently available techniques.

Recoverable Reserves

Reservoir

Rig Crew

Roughneck /Ruffneck

Roustabout

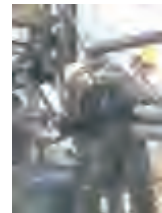
That proportion of the oil and/gas in a reservoir that can be removed using currently available techniques.

The underground formation where oil and gas has accumulated. It consists of a porous rock to hold the oil or gas, and a cap rock that prevents its escape.

A team of personnel working on oil drilling rig. Crew members include tool pushers/rig managers, drillers, derrickhand, motor hand, roughneck and roustabout.

Oil rig personnel responsible for the operation of equipment and machines as required by the particular operation being carried out at that time by the driller. During drilling, one Roughneck is present in the mud process room at all times to take mud weights and ensure that shakers and other machines are working properly.

Oil rig personnel or drill crew member who typically performs various jobs requiring little training. These jobs include handling the loading and unloading of equipment and assist in general operations around the rig.



Roustabout

Royalty

1. The price charged by the owner of an oil and gas resources (government in the case of Ghana) for the right to develop those resources.
2. Payment (either in cash or kind) that may be due to the host government, mineral owner or landowner, in return to the producer having access to the mineral resources. In Ghana royalty payment ranges between 4%-12%.

Seals

Impermeable cap rocks in carrier beds that inhibit further movement of hydrocarbons.

Seismic Data

Data generated by using vibrations to capture either a two-dimensional (2-D) or three-dimensional (3-D) picture of the rock layers beneath the surface. The interpretation of seismic data allows the scientist to estimate the picture of the rocks beneath the surface without drilling or digging. The collection.

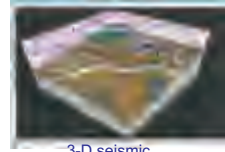
2-D Seismic

Secondary Recovery

Tool Pusher/Rig Manager

Utilization Agreement

of seismic data involves sending shock waves into the ground and



3-D seismic

measuring how long it takes for the subsurface rocks to reflect these waves back to the surface.

Recovery of oil or gas from a reservoir by artificially maintaining or enhancing the reservoir pressure by injecting gas, water or other substances into the reservoir rock.

The head of all oil rig crew on the drilling location in charge of all rig operations, maintenance and crew upkeep. They work closely in conjunction with the 'company man' with regard to the actual drilling of the well. In recent times, tool pushers have also taken on an administrative roles of a sort as they frequently do paperwork related to the rig crew regarding payroll, benefits, etc.

A contract between the host government and a number of lessees holding contiguous leases over a potential oil and gas reservoir and intended to facilitate the orderly and timely development of oil and gas resources within a unit area.

(continue overleaf)

Upstream

The Jubilee field is a unitized oil field. The agreement usually designated one party as the operator to conduct all activities relating to the development of the unit area. Tullow Oil is the unit operator for the Jubilee field.

Refers to the segment of the oil and gas value chain that deals with searching for, recovery and production of crude oil and natural gas. The upstream oil sector is also known as the exploration and production (E&P) sector.

Wellbore

Hole drilled for the purpose of exploration for or extraction of natural resources such as water, gas or oil where a well may be produced and a resource is extracted for an extended period.



Wellbore

Wildcat Well

A well drilled in an unproven area. See "exploration well".



Wildcat Well

Workover

Remedial work on the equipment within a well, the well pipework, or relating to attempts to increase the rate of flow.



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