

# PETROLEUM COMMUNICATION FOUNDATION

**Abandoned Well:** A well that is not in use because it has ceased to produce natural gas or because it was a dry hole.

*Provided by the Canadian Energy Research Institute (CERI).*

**Abandonment:** Converting a drilled well to a condition that can be left indefinitely without further attention and will not damage freshwater supplies, potential petroleum reservoirs or the environment.

**Abiogenic Theory:** A theory that maintains petroleum originated from hydrocarbons that were trapped inside the Earth during the planet's formation and are slowly moving upwards.

**Acidizing:** The injection of acids under pressure into the rock formation to create channels that allow the hydrocarbons to flow more easily into the wellbore.

**Acid Rain:** Natural rain or snow containing sulphuric acid and nitric acid which is created when industrial pollutants, especially sulphur dioxide and nitrogen oxides, undergo chemical changes in the atmosphere.

**Aggregator:** An independent corporation which buys natural gas from many producers, re-sells it to buyers, and obtains the necessary pipeline transportation capacity and removal/export permits and licences. Aggregators usually sell to buyers that individually require large amounts of natural gas, such as local distribution companies and

large industrial customers. They are sometimes referred to as MARKETERS.

*Provided by the Canadian Energy Research Institute (CERI).*

**Air Drilling:** The use of compressed air instead of mud as a drilling fluid to remove the cuttings; air drilling increases penetration rates but offers no control over water in the subsurface formations or downhole gas pressure.

**Allowables:** The rate of production for a well or group of wells that is set by a regulatory authority (conservation commission).

*Provided by the Canadian Energy Research Institute (CERI).*

**Alternate Fuels:** Other fuels that can be substituted for the fuel in use. In the case of natural gas, the most common alternative fuels are distillate fuel oils, residual fuel oils, coal and wood.

*Provided by the Canadian Energy Research Institute (CERI).*

**Annulus:** The space between two concentric lengths of pipe or between pipe and the hole in which it is located.

**Associated Gas:** Gas that is produced from the same reservoir along with crude oil, either as free gas or in solution.

**Backhaul:** A transaction that results in natural gas being transported in the opposite direction

of the physical flow of a transportation system. This is usually achieved by redelivering the gas at a point upstream from the point of receipt.

*Provided by the Canadian Energy Research Institute (CERI).*

**Backstopping:** A service that provides alternate supplies of natural gas in the event that a consumer's gas is not delivered. If consumers are purchasing gas from a local distribution company, then this service is automatically provided. If they are purchasing directly from producers (including those who contract with *brokers* or *marketers*) then this service may be provided by a local distribution company, depending on the province/state. Note also that backstopping services can be provided by *marketers* or *brokers* if this service is included in the contract.

*Provided by the Canadian Energy Research Institute (CERI).*

**Benzene:** A volatile organic compound that occurs naturally in petroleum and is also produced by the combustion of petroleum products.

**Biogenic Theory:** The most widely accepted theory explaining the origins of petroleum: as organic materials become deeply buried over time, heat and pressure transform them into hydrocarbons.

**Bitumen:** Petroleum that exists in the semisolid or solid phase in natural deposits.

**Blowout:** An uncontrolled flow of gas, oil or other fluids from a well.

**Blowout Preventer (BOP):** Equipment that is installed at the wellhead to control pressures and fluids during drilling, completion and

certain remedial operations to restore production.

**Bonus Payment:** The amount paid at land auctions for Crown mineral rights.

**BOP Stack:** Several blowout preventers used in combination.

**British Thermal Unit (Btu):** The quantity of heat required to raise the temperature of one pound of water by one degree Fahrenheit at or near 39.2° Fahrenheit.

*Provided by the Canadian Energy Research Institute (CERI).*

**Broker:** An individual or independent corporation engaged in bringing together sellers and buyers of natural gas, assisting in negotiations, arranging transportation and delivery terms. Brokers usually do not buy or sell for their own account but act as agent for the buyer and/or seller.

*Provided by the Canadian Energy Research Institute (CERI).*

**Bundled Service:** A service provided by a pipeline or a local distribution company which includes the natural gas as well as all the necessary services required for a consistent supply (backstopping, load balancing, storage).

*Provided by the Canadian Energy Research Institute (CERI).*

**Burner-tip:** The point of end-use consumption of a particular fuel, such as natural gas or residual fuel oil.

*Provided by the Canadian Energy Research Institute (CERI).*

**Burner-tip Price:** The price of natural gas (or other fuels) paid by the final consumer: for natural gas, this includes the price of the gas plus the cost of processing, gathering, transmitting and distributing it.

*Provided by the Canadian Energy Research Institute (CERI).*

**Buy/Sell Arrangement:** A final consumer buys gas directly from a producer (either at the city-gate or provincial border), and sells it to the local distribution company at their weighted average cost of gas (WACOG). The distribution company then sells the gas back to the consumer at the distribution company's normal rate. The amount of money a consumer saves by using a buy/sell arrangement will be the difference between the amount paid to the producer and the distribution company's weighted average cost of gas (less any administrative fees if done through *marketers* or *brokers*).

*Provided by the Canadian Energy Research Institute (CERI).*

**Bypass:** The ability of customers (usually industrial) to obtain gas directly from a pipeline and thereby circumvent the local distribution company.

*Provided by the Canadian Energy Research Institute (CERI).*

**Cable Tool:** One of two principal methods of drilling for gas and oil. Cable tool is the older method and consists of raising and dropping a heavy drill bit, suspended from the end of a cable, so that it pounds and pulverizes its way through the subsurface structures. Water in the hole keeps the cuttings in suspension for removal at regular intervals by bailing.

*Provided by the Canadian Energy Research Institute (CERI).*

**Cable-tool Rig:** A type of drilling device used from the 1850s to the 1930s that employed a heavy chisel-like bit which was suspended on a cable and dropped repeatedly into the rock at the bottom of the hole.

**Capacity Assignment:** When a capacity holder on a pipeline temporarily "leases" their capacity to another party of their choosing. The terms of the "lease" are negotiated between the lessor and the lessee.

*Provided by the Canadian Energy Research Institute (CERI).*

**Capacity Brokering:** When a pipeline system leases capacity rights on behalf of the capacity holder.

*Provided by the Canadian Energy Research Institute (CERI).*

**Cap Rock:** The impervious geological rock that overlays the reservoir rock and traps gas or crude oil in the reservoir.

*Provided by the Canadian Energy Research Institute (CERI).*

**Carbonate:** Rock formed from the hard parts of marine organisms mainly consisting of calcite, aragonite and dolomite.

**Carbon Dioxide (CO<sub>2</sub>):** A non-toxic gas produced from decaying materials, respiration of plant and animal life, and combustion of organic matter, including fossil fuels; carbon dioxide is the most common greenhouse gas produced by human activities.

**Casing:** A type of pipe that is used for encasing a smaller diameter carrier pipe for installation in a well.

*Provided by the Canadian Energy Research Institute (CERI).*

**Casing-head Gasoline (naphtha):** A highly volatile liquid that is separated from natural gas at the wellhead and was once used as unrefined gasoline.

**Cat Cracking (catalytic cracking):** A refinery process that uses catalysts in addition to pressure and heat to convert heavier fuel oil into lighter products such as gasoline and diesel fuel.

**Catalysts:** Materials that assist chemical reactions.

**Cathodic Protection:** A technique for preventing corrosion in metal pipelines and tanks that uses weak electric currents to offset the current associated with metal corrosion.

**Centrifugal Pump:** A rotating pump, commonly used for large-volume oil and natural gas pipelines, that takes in fluids near the centre and accelerates them as they move to the outlet on the outer rim.

**Christmas Tree:** The valve assembly at the top of tubing strings and casing of a gas well (or a crude oil well) to provide primary pressure reduction, production rate control and shut-in capabilities.

*Provided by the Canadian Energy Research Institute (CERI).*

**City-Gate:** The delivery point or the point of interconnection between long-distance transmission pipelines (usually interprovincial or interstate) and local distribution companies.

**Clastic:** Made up of pieces (clasts) of older rock; rock derived from mechanical process; generally sandstone, siltstone or shale.

**Coal Bed Methane (CBM):** Natural gas generated and trapped in coal seams.

**Coal Gas:** A mixture of hydrogen, carbon monoxide and methane, produced by distilling coal, that was once used for heating and lighting.

**Co-firing:** The process of burning natural gas in conjunction with another fuel.

*Provided by the Canadian Energy Research Institute (CERI).*

**Cogeneration:** The simultaneous production of electricity and steam from one energy source (e.g., natural gas, oil, biomass).

*Provided by the Canadian Energy Research Institute (CERI).*

**Cogenerator:** In the U.S., a cogenerator is an entity that uses cogeneration primarily for the purpose of producing electricity and steam for their own use. In Canada, a cogenerator is any entity that produces electricity by cogeneration. See *non-utility generators* and *independent power producers*.

*Provided by the Canadian Energy Research Institute (CERI).*

**Coiled Tubing:** A continuous, jointless hollow steel cylinder that is stored on a reel and can be uncoiled or coiled repeatedly as required; coiled tubing is increasingly being used in well completion and servicing instead of traditional tubing, which is made up of joined sections of pipe.

**Coke:** Solid carbon that remains in the refining process after cracking of hydrocarbons.

**Coking:** A process used to break down heavy oil molecules into lighter ones by removing the carbon that remains as a coke residue.

**Combined-Cycle Generation:** When the steam generated in a cogeneration process is used to create additional electricity. In this way, the efficiency of producing electricity is increased.

*Provided by the Canadian Energy Research Institute (CERI).*

**Commercial Sector:** Natural gas consumers who use natural gas in their businesses and institutions (including federal/state/provincial governments, agencies, schools, restaurants, hospitals, hotels, apartment buildings, and natural gas for fleet vehicles). Note, the commercial sector does not include those consumers who use natural gas as an input into the production of goods. See also *industrial sector*.

*Provided by the Canadian Energy Research Institute (CERI).*

**Commingled Gas:** A homogeneous mix of gas from various physical (or contractual) sources.

*Provided by the Canadian Energy Research Institute (CERI).*

**Commodity Charge:** The portion of the cost to transport natural gas on a gathering, transmission or distribution system that is variable (i.e., it is a per/unit charge that depends on the quantity shipped). See also DEMAND CHARGE.

*Provided by the Canadian Energy Research Institute (CERI).*

**Common Depth Point Method:** A method of recording and processing seismic signals so that signals belonging to the same subsurface point are brought together.

**Completion:** The process of finishing a well so that it is ready to produce oil or gas.

**Compressed Natural Gas (CNG):** Natural gas that has been highly compressed and is stored in high-pressure surface containers. CNG is used as a transportation fuel for automobiles, trucks and busses.

*Provided by the Canadian Energy Research Institute (CERI).*

**Compressor:** A machine used to boost natural gas pressure to move it through pipelines or other facilities.

**Compressor Station:** Permanent facilities that supply the energy needed to move natural gas at increased pressures.

*Provided by the Canadian Energy Research Institute (CERI).*

**Condensate:** Hydrocarbons, usually produced with natural gas, which are liquid at normal pressure and temperature.

**Consumption:** The quantity of natural gas used by final consumers.

*Provided by the Canadian Energy Research Institute (CERI).*

**Contract Carrier:** A company that transports gas that belongs to another party on a contractual basis. The company charges a fee for the service.

*Provided by the Canadian Energy Research Institute (CERI).*

**Contract Demand:** The maximum volume of natural gas that will either be (a) shipped by the gathering/transmission/distribution system or (b) supplied by the gas seller. The seller(shipper) is obligated to supply(transport) natural gas volumes up to the contract demand volume.

*Provided by the Canadian Energy Research Institute (CERI).*

**Conventional Crude Oil:** Petroleum found in liquid form, flowing naturally or capable of being pumped without further processing or dilution.

**Conventional Gas:** Natural gas that can be produced using traditional methods. The distinction between conventional and unconventional gas is becoming less clear. Also see *unconventional gas*.

*Provided by the Canadian Energy Research Institute (CERI).*

**Core:** A continuous cylinder of rock, usually from five to 10 centimetres in diameter, cut from the bottom of a wellbore as a sample of an underground formation.

**Core-market:** Generally, the core-market represents those consumers who use natural gas in a "fundamental way" (e.g., for heating their homes) and do not have the ability to substitute an alternate source of fuel. However, each public utility commission has its own unique definition.

*Provided by the Canadian Energy Research Institute (CERI).*

**Core-market Policy:** A public utility commission's rules on who, how and under what conditions natural gas can be purchased directly from producers by consumers in the core-market. Each public utility commission has its own rules.

*Provided by the Canadian Energy Research Institute (CERI).*

**Cracking:** A refining process for increasing the yield of gasoline from crude oil; cracking involves breaking down the larger, heavier and more complex hydrocarbon molecules into simpler and lighter molecules through the use of heat and pressure, and sometimes a catalyst.

**Critical Sour Gas Wells:** A sour gas well that has the potential to release unsafe levels of hydrogen sulphide, which might affect nearby residents.

**Critical Zone:** The zone in a well where sour gas will likely be encountered.

**Crown Land:** Mineral rights that are owned by the federal or provincial governments in Canada.

*Provided by the Canadian Energy Research Institute (CERI).*

**Crude Oil & Equivalent:** This includes the following liquid hydrocarbons: crude oil, synthetic crude oil, bitumen, condensate and pentanes plus.

**Cost-of-Service:** A term used in public utility regulation to mean the total number of dollars required to cover the LDCs costs (i.e., revenue requirements). The costs that are included can include an amount to cover operation and maintenance expenses and other necessary costs such as taxes (income taxes, depreciation, depletion and amortization of the

property not covered by ordinary maintenance. A "fair" return on capital and owners' equity is also allowed to ensure that the LDC maintains financial integrity, attracts new capital, and compensates the owners for the risks involved. *Provided by the Canadian Energy Research Institute (CERI).*

**Cubic Foot:** The volume of gas that fills a cube that is one foot by one foot by one foot under set temperature and pressure conditions. The standard pressure is 14.73 psia and the standard temperature is 60 degrees Fahrenheit.

*Provided by the Canadian Energy Research Institute (CERI).*

**Curtailement:** Curtailment of gas service is a methodology used to distribute an LDC's natural gas supply when the demand for natural gas exceeds supply. Generally a hierarchy is created whereby those customers who rank lower will have gas supply reduced or temporarily cut-off.

*Provided by the Canadian Energy Research Institute (CERI).*

**Cushion Gas:** The volume of natural gas that must be kept in a gaseous storage facility (e.g., a depleted reservoir) in order to ensure adequate pressure to allow *working gas* to be withdrawn.

*Provided by the Canadian Energy Research Institute (CERI).*

**Cuttings:** Chips and small fragments of rock cut by the drill bit and brought to the surface by the flow of drilling mud.

**Darcy:** A measure of rock permeability (i.e., the degree to which natural gas and crude oil can move through the rocks).

*Provided by the Canadian Energy Research Institute (CERI).*

**Deep Basin Gas:** Gas that is found at depths greater than the average for a particular area. *Provided by the Canadian Energy Research Institute (CERI).*

**Deliverability:** The amount of natural gas a well, field, gathering, transmission or distribution system can supply in a given period of time.

*Provided by the Canadian Energy Research Institute (CERI).*

**Delivered Price:** The price of natural gas (or other fuels) paid by the final consumer: for natural gas, this includes the price of the gas plus the cost of processing, gathering, transmitting and distributing it (sometimes called the *burner-tip price*). However, "delivered price" can also mean the total price for the gas at any point along the way to the final consumer. For example, it could refer to a delivered price at the city-gate or a delivered price to the pipeline.

*Provided by the Canadian Energy Research Institute (CERI).*

**Demand Charge:** That portion of the transportation tariff that the customer must pay whether or not they use the service. The charge is based on the *contract demand* volume. Shippers are responsible for paying the demand charge even if no gas is shipped. See also *commodity charge*.

*Provided by the Canadian Energy Research Institute (CERI).*

**Demand-Side Management (DSM):** As the name suggests, DSM is any measure taken by a utility (gas or electric) to affect the demand

for the fuel, including conservation (or energy-efficiency strategies), load (or use) management, or fuel switching. For example, an electric utility could use fuel switching to natural gas during times of peak demand for electricity, rather than build new facilities. Or, a natural gas utility could use a DSM conservation program to encourage (or subsidize) the use of more efficient natural gas furnaces.

*Provided by the Canadian Energy Research Institute (CERI).*

**Density:** The heaviness of crude oil, indicating the proportion of large, carbon-rich molecules, generally measured in kilograms per cubic metre (kg/m<sup>3</sup>) or degrees on the American Petroleum Institute (API) gravity scale; in Western Canada oil up to 900 kg/m<sup>3</sup> is considered light to medium crude – oil above this density is deemed as heavy oil or bitumen.

**Deregulation:** The process of changing natural gas market regulations to allow a greater role for market forces to balance supply and demand and set prices. It does not mean the absence of regulation.

*Provided by the Canadian Energy Research Institute (CERI).*

**Derrick:** A load-bearing tower-like structure over a natural gas (or crude oil) well which holds the hoisting and lowering equipment.

*Provided by the Canadian Energy Research Institute (CERI).*

**Desiccant:** Any absorbent or adsorbent (liquid or solid) that will remove water or water vapour from a material.

*Provided by the Canadian Energy Research Institute (CERI).*

**Desulphurization:** The process of removing sulfur and sulfur compounds from gases or liquid hydrocarbon mixes.

*Provided by the Canadian Energy Research Institute (CERI).*

**Development Well:** A well drilled in or adjacent to a proven part of a pool to optimize petroleum production.

**Devonian Shale:** Geological formation, typically hundreds of feet thick, that underlie much of the Appalachian Basin. It is known to contain significant volumes of natural gas, but lacks sufficient natural permeability for ordinary production.

*Provided by the Canadian Energy Research Institute (CERI).*

**Directional Drilling:** Controlled drilling at a specified angle from the vertical.

*Provided by the Canadian Energy Research Institute (CERI).*

**Directional (deviated) Well:** A well drilled at an angle from the vertical by using a slanted drilling rig or by deflecting the drill bit; directional wells are used to drill multiple wells from a common drilling pad or to reach a subsurface location beneath land where drilling cannot be done.

**Discovery Well:** Exploratory well that discovers a new gas or oil field.

*Provided by the Canadian Energy Research Institute (CERI).*

**Distribution System:** Generally the distribution system consists of mains, service connections, and equipment that carry or

control the supply of natural gas from the interprovincial or interstate pipeline systems, or the point of local supply, to the individual, end users.

*Provided by the Canadian Energy Research Institute (CERI).*

**Dolomite:** Calcium carbonate-rich sedimentary rock in which oil or gas reservoirs are often found.

**Downstream:** The refining and marketing sector of the petroleum industry.

**Drawworks:** The hoisting mechanism on a drilling rig which spools off or takes in the drilling line and thus raises or lowers the drill string and bit.

*Provided by the Canadian Energy Research Institute (CERI).*

**Drilling Mud:** Fluid circulated down the drill pipe and up the annulus during drilling to remove cuttings, cool and lubricate the bit, and maintain desired pressure in the well.

**Drill Pipe:** Steel pipe sections, approximately 9 meters long, that are screwed together to form a continuous pipe extending from the drilling rig to the drilling bit at the bottom of the hole. Rotation of the drill pipe and bit causes the bit to bore through the rock.

*Provided by the Canadian Energy Research Institute (CERI).*

**Drillstem Test:** A method of sampling fluid from a formation using a tool attached to the drillstem; the sample is used to assess the type and volume of fluids in the formation as well as their pressure and rate of flow.

**Drill String:** The column or string of drill pipe. The drill string carries the mud down to, and rotates, the drill bit.

**Dry Gas:** Natural gas from the well that is free of liquid hydrocarbons, or gas that has been treated to remove all liquids; pipeline gas.

**Dry Hole:** An unsuccessful well; a well not capable of producing commercial quantities of oil or gas.

**Electric Well Log:** A record of electrical characteristics of formations that have been drilled through. Electric logs are used to identify the formations, determine the nature and amount of fluids they contain, and estimate their depth.

*Provided by the Canadian Energy Research Institute (CERI).*

**End-User:** A person or company who actually consumes natural gas (as opposed to one who sells or resells it).

*Provided by the Canadian Energy Research Institute (CERI).*

**Enhanced Oil Recovery (EOR):** Any method that increases oil production by using techniques or materials that are not part of normal pressure maintenance or water flooding operations. For example, natural gas can be injected into a reservoir to "enhance" or increase oil production.

*Provided by the Canadian Energy Research Institute (CERI).*

**Established Reserves:** Those reserves recoverable under current technology and present and anticipated economic conditions.

**Excess Deliverability:** When natural gas deliverability exceeds production (i.e., market demand) for a sustained period of time.

*Provided by the Canadian Energy Research Institute (CERI).*

**Exploration:** The act of searching for potential subsurface reservoirs of gas or oil. Methods include the use of magnetometers, gravity meters, seismic exploration, surface mapping, and exploratory drilling.

*Provided by the Canadian Energy Research Institute (CERI).*

**Exploratory Well:** A well drilled either in search of a new and as yet undiscovered accumulation of oil and gas, or in an attempt to significantly extend the limits of a known reservoir.

*Provided by the Canadian Energy Research Institute (CERI).*

**Extraction Loss:** The reduction in volume of natural gas resulting from the removal of the natural gas liquid constituents of natural gas at the processing plant. See also *shrinkage*.

*Provided by the Canadian Energy Research Institute (CERI).*

**Farmout:** An arrangement whereby the owner of a lease assigns some portion (or all) of the lease to another company for drilling.

*Provided by the Canadian Energy Research Institute (CERI).*

**Federal Energy Regulation Commission (FERC):** A U.S. agency which has jurisdiction over natural gas companies and producers that sell or transport gas in interstate commerce for resale (e.g. they set tariffs for interstate

pipelines). The FERC also has jurisdiction over wholesale interstate electric rates, hydroelectric licensing and oil pipeline rates. The predecessor to the FERC was the Federal Power Commission.

*Provided by the Canadian Energy Research Institute (CERI).*

**Field:** The geographical area encompassing a group of one or more underground petroleum pools sharing the same or related infrastructure.

**Field Pressure:** The pressure of the natural gas as it is found in the underground formations from which it is produced.

*Provided by the Canadian Energy Research Institute (CERI).*

**Field Price:** The amount received by petroleum producers after deducting transportation and distribution costs.

**Firm (Transportation) Service:** A service provided by a gathering, transmission or distribution system to transport gas for a shipper (up to the daily *contract demand*). It cannot be curtailed except under *force majeure*. Firm service takes priority over interruptible service.

*Provided by the Canadian Energy Research Institute (CERI).*

**Fish:** An object left in the well bore during drilling or workover operations that must be recovered or drilled around before work can proceed.

*Provided by the Canadian Energy Research Institute (CERI).*

**Fishing:** The term encompasses both the special equipment and the special procedures required to remove undesirable objects from the well bore.

*Provided by the Canadian Energy Research Institute (CERI).*

**Force Majeure:** Literally means superior or irresistible force that excuses a failure to perform. Force majeure events must not have been reasonably foreseeable. This provision is common in natural gas contracts because it specifies the effect force majeure will have on the rights and obligations of the parties under the contract.

*Provided by the Canadian Energy Research Institute (CERI).*

**Formation:** A designated subsurface layer that is composed throughout of substantially the same kind of rock or rock types.

**Fracturing (or fracing):** The practice of pumping special fluids down the well under high pressure; fracturing causes the formation to crack open, creating passages for the reservoir fluids to more easily flow into the wellbore.

**Fuel Switching:** The ability of a boiler to burn alternate fuels, such as gas or residual fuel oil. Switching occurs when one fuel is substituted for another, usually on the basis of price, and can be categorized by the rate at which it occurs:

- Very short-term switching of gas to an alternate fuel in dual-fired boilers.
- Intermediate-term switching through retrofits to make gas boilers which can only burn gas, dual fired with other fuels.

- Longer-term switching of gas equipment to total or partial use of non-gas fuels.  
*Provided by the Canadian Energy Research Institute (CERI).*

**Futures Market:** A market trading in contracts to buy and sell a commodity at a fixed price on a certain date.

*Provided by the Canadian Energy Research Institute (CERI).*

**Gas:** One of the three forms of matter: liquid, solid and gas. Gas is characterized by the fact that it has neither shape nor specific volume: it expands to fill the entire container in which it is held.

*Provided by the Canadian Energy Research Institute (CERI).*

**Gas Bubble:** An excess of natural gas deliverability relative to demand requirements (or production) at current prices. Also see *excess deliverability*.

*Provided by the Canadian Energy Research Institute (CERI).*

**Gas Cap:** A layer of free gas on top of the oil zone in an underground reservoir.

*Provided by the Canadian Energy Research Institute (CERI).*

**Gas Controller:** A person or persons who are responsible for monitoring and controlling daily gas system operations and ensuring safety of a gathering, transmission or distribution system.

*Provided by the Canadian Energy Research Institute (CERI).*

**Gas Cycling:** A petroleum recovery process that takes produced gas and condensate and injects it back into the reservoir to increase pressure and increase the production of natural gas liquids. See also *repressuring*.

*Provided by the Canadian Energy Research Institute (CERI).*

**Gas in Place (GIP):** The volume of gas in a reservoir at any given time, calculated at standard temperature and pressure conditions, including both recoverable and nonrecoverable gas.

*Provided by the Canadian Energy Research Institute (CERI).*

**Gas Meter:** An instrument that measures (and may record) the volume of gas that has passed through it.

*Provided by the Canadian Energy Research Institute (CERI).*

**Gas Pool:** The term "pool" is generally synonymous with the term "reservoir".

*Provided by the Canadian Energy Research Institute (CERI).*

**Gas Processing Plant:** Any facility which performs one of the following: removing liquefiable hydrocarbons from wetgas or casinghead gas (i.e., gas processing); removing undesirable gaseous and particulate elements from natural gas (i.e., gas treatment); removing water or moisture from the gas stream (i.e., dehydration).

*Provided by the Canadian Energy Research Institute (CERI).*

**Gas Reservoir:** A rock stratum that forms a trap for the accumulation of crude oil and natural gas.

*Provided by the Canadian Energy Research Institute (CERI).*

**Gas Transmission Systems:** Pipelines that carry natural gas at high pressure from producing areas to consuming areas.

**Gas Turbine:** When gas (under pressure or formed by combustion) is directed against a series of turbine blades; the energy in the expanding gas is converted into mechanical energy and supplies power at the shaft.

*Provided by the Canadian Energy Research Institute (CERI).*

**Gas Year:** The gas year runs from November 1 to October 31 of the next year.

*Provided by the Canadian Energy Research Institute (CERI).*

**Gasification:** The process of turning liquefied natural gas (LNG) into a vapourous or gaseous state by increasing the temperature and decreasing the pressure.

*Provided by the Canadian Energy Research Institute (CERI).*

**Gathering Lines:** Pipelines that move raw petroleum from wellheads to processing plants and transmission facilities.

**Gathering System:** A system of pipelines, compressor stations and other related facilities that gather natural gas from the supply region and transport it to the major transmission systems. Generally, pipelines in gathering systems are smaller in diameter and operate at lower pressures, although some gathering systems (e.g., the NOVA system in Alberta)

also have lines that are comparable to those found in transmission systems. The natural gas on the gathering system is usually processed and is "pipeline quality".

*Provided by the Canadian Energy Research Institute (CERI).*

**Geochemistry:** The science of chemistry applied to rocks and minerals; geochemists analyse the contents of subsurface rocks for the presence of organic matter associated with oil deposits.

**Geological Trap:** Any geological structure that stops the migration of natural gas, crude oil and water through subsurface rocks, causing the hydrocarbons to accumulate into pools in the reservoir rock.

*Provided by the Canadian Energy Research Institute (CERI).*

**Geologist:** A person trained in the study of the Earth's crust; petroleum geologists search for traps that could contain petroleum and recommend drilling locations.

**Geophones (or jugs):** Sensitive vibration-detecting instruments used in conducting seismic surveys; marine versions are known as hydrophones.

**Geophysical Survey:** Searching and mapping the subsurface structure of the earth's crust using geophysical methods (e.g., seismic) to locate probable reservoir structures capable of producing commercial quantities of natural gas and/or crude oil.

*Provided by the Canadian Energy Research Institute (CERI).*

**Geophysics:** The science that deals with the relations between the physical features of the Earth and forces that produce them; geophysics includes the study of seismology and magnetism.

**Greenhouse Effect:** The warming of the Earth's surface caused by the presence of carbon dioxide and other gases in the atmosphere that trap the heat of the sun.

**Greenhouse Gases:** A wide variety of gases that trap heat near the Earth's surface, preventing its escape into space; greenhouse gases, such as carbon dioxide, methane, nitrous oxide and water vapour, occur naturally or result from human activities such as the burning of fossil fuels.

**Ground-level Ozone:** See *volatile organic compounds*.

**Gun Perforator:** A device that creates small holes through the casing, cement and into the producing formation of a well. The holes provide channels for gas and/or crude oil to flow into the well.

*Provided by the Canadian Energy Research Institute (CERI).*

**Gusher:** A well that comes in with such great pressure that the oil or gas blows out of the wellhead like a geyser; gushers are rare today because of improved drilling technology, especially the use of drilling mud to control downhole pressure.

**Heat Pump:** A year-round heating air conditioning system. When operating as a heating system, heat is absorbed from an outside medium (e.g., air, water or the earth) and this heat, together with the heat equivalent of the work of compression, is supplied to the space to be heated. When operating on the

cooling cycle, heat is absorbed from the space to be cooled and this heat, together with the heat equivalent of the work of compression, is rejected to the outside medium.

*Provided by the Canadian Energy Research Institute (CERI).*

**Heavy Oil:** Dense, viscous oil, with a high proportion of bitumen, which is difficult to extract with conventional techniques and is more costly to refine.

**Horizontal Drilling:** Drilling a well that deviates from the vertical and travels horizontally through a producing layer.

**Horizontal Laterals:** A series of drainage wells branching off from a horizontal wellbore.

**Hot Water Process:** A method for separating bitumen from oil sand using hot water and caustic soda, developed by Karl Clark of the Alberta Research Council.

**Hydrocarbons:** A large class of liquid, solid or gaseous organic compounds, containing only carbon and hydrogen, which are the basis of almost all petroleum products.

**Hydrocracking:** A refining process which adds hydrogen to the carbon-rich molecules of heavier oil, in the presence of a catalyst, to produce high-octane gasoline.

**Hydrogen Sulphide (H<sub>2</sub>S):** A naturally occurring, highly toxic gas with the odour of rotten eggs.

**Hydro-transport:** A process that uses hot water to transport oil sand through a pipeline to a processing plant.

**Hydrotreating:** The process of adding hydrogen to heavy oil or bitumen molecules during the upgrading process.

**Incentive Regulation:** A variety of methods for regulating natural gas pipeline operators which have an incentive "bonus" built into them.

*Provided by the Canadian Energy Research Institute (CERI).*

**Incremental Tolls:** Tolls that are charged on the newly expanded part of a pipeline system. This is one method of creating tolls to pay for an expansion of a pipeline, the other is *rolled-in tolls*.

*Provided by the Canadian Energy Research Institute (CERI).*

**Independent Power Producers (IPPs):** In the U.S., an IPP is an entity which produces electricity from natural gas for the primary purpose of selling the electricity to the utility. In Canada, it is any non-utility that produces electricity, and the term is often used interchangeably with "NUGs" and "co generators".

*Provided by the Canadian Energy Research Institute (CERI).*

**Indexing:** Tying the commodity price in a contract to other published prices, such as spot prices for natural gas or an alternate fuel. Can also be tied to general indexes such as the consumer price index or the producer price index.

*Provided by the Canadian Energy Research Institute (CERI).*

**Industrial Sector:** Natural gas consumers who use gas in manufacturing, forestry and

mining processes. May also include consumers who use natural gas to generate electricity.

*Provided by the Canadian Energy Research Institute (CERI).*

**Infill Drilling:** Wells drilled between established producing wells on a lease in order to increase production from the reservoir.

**Infill Well:** Any well that is drilled on a closer-than-normal well spacing pattern or requirement. Also, any well drilled between existing wells producing from the same reservoir.

*Provided by the Canadian Energy Research Institute (CERI).*

**Injection Well:** A well used for injecting air, steam or fluids into an underground formation.

**In-situ:** In its original place; in position; in-situ recovery refers to various methods used to recover deeply buried bitumen deposits, including steam injection, solvent injection and firefloods.

**Interruptible Transportation Service:** An interruptible gas transportation service provided under contract for gas that is not owned by the pipeline/distribution company. The interruption is at the option of the gathering/transmission/distribution company.

*Provided by the Canadian Energy Research Institute (CERI).*

**Intervenor:** A person, business entity or other organization that is granted the right to participate in a regulatory hearing.

*Provided by the Canadian Energy Research Institute (CERI).*

**Joint Implementation:** A means of reducing global greenhouse gas emissions whereby a country receives credit for supporting emissions reductions elsewhere – for example, planting trees or replacing inefficient power generation facilities in developing countries.

**Kelly:** The first and sturdiest joint of the drill string in conventional rotary drilling rigs; a thick-walled, hollow steel forging with four flat sides that fits into a square hole in the rotary table.

**Kerosene:** A mixture of hydrocarbons produced by distilling petroleum, which is used as a lamp oil or jet fuel.

**Kick:** When fluids with a higher pressure than that exerted by the drilling mud enter the wellbore; this creates the potential for a well to blow out of control.

**Land:** In the petroleum industry, "land" often refers to the oil and gas rights on a particular area of land. For example, in a "land sale", the oil and/or gas rights are "sold" (although in reality the rights are leased).

*Provided by the Canadian Energy Research Institute (CERI).*

**Landman:** A member of the exploration team whose primary duties are formulating and carrying out exploration strategies and managing an oil company's relations with its landowners and partners, including securing and administering oil and gas leases and other agreements.

**Lease:** An agreement between two or more parties where the owner of the land grants another party the right to drill and produce petroleum substances in exchange for payment.

**Lease and Plant Fuel:** Natural gas that is used as a fuel in lease or plant operations such as for compression or gas lift operations.

*Provided by the Canadian Energy Research Institute (CERI).*

**Lease Separator:** A facility installed on a leased area for the purpose of separating gases and/or water from liquid hydrocarbons.

*Provided by the Canadian Energy Research Institute (CERI).*

**Light Crude Oil:** Liquid petroleum which has a low density and flows freely at room temperature.

**Limestone:** Calcium carbonate-rich sedimentary rocks in which oil or gas reservoirs are often found.

**Linepack:** The volume of gas which is needed to be kept in the pipe of a gathering, transmission or distribution system in order to ensure the functioning of the system. Linepack can sometimes be used for short-term temporary storage of additional gas supplies.

*Provided by the Canadian Energy Research Institute (CERI).*

**Liquefied Natural Gas (LNG):** Supercooled natural gas that is maintained as a liquid at -160° Celsius; LNG occupies 1/640th of its original volume and is therefore easier to transport if pipelines cannot be used.

**Liquefied Petroleum Gases (LPG):** Butane, propane and other light ends separated from natural gasoline or crude oil by fractionation or other process. At atmospheric pressure, LPGs revert to the gaseous state.

*Provided by Illustrated Petroleum Reference Dictionary.*

**Load Balancing:** The matching of supply with demand, sometimes through storage or linepack.

*Provided by the Canadian Energy Research Institute (CERI).*

**Load Balancing Service:** When a seller (LDC, marketer, broker, producer) supplies additional gas above what the consumer has contracted for on a particular day or time of day, combined with the use of excess gas by the distribution company on other days, when the consumer does not need it. This service is required because some consumers do not use the same volume of gas every day of the year due to operational and weather factors, but for economic reasons they often purchase fixed daily volumes of gas supply.

*Provided by the Canadian Energy Research Institute (CERI).*

**Load Factor:** The ratio of the average volume of natural gas shipped (or consumed) over a set period of time to the contract demand volume for the same time period. Load factors are usually expressed in percent.

*Provided by the Canadian Energy Research Institute (CERI).*

**Local Distribution Companies:** The local gas companies that deliver natural gas at low pressure to homes and businesses.

**Logs:** Detailed depth-related records of certain significant details of an oil or gas well; usually obtained by lowering measurement instruments into a well.

**Looping:** A method of increasing capacity on a pipeline. It is a paralleling of an existing

pipeline by another line over any part or the whole length of the original pipeline.

*Provided by the Canadian Energy Research Institute (CERI).*

**Main:** A distribution line that serves as a common source of supply for more than one service line. Its dimensions and operating pressure can be similar to those in a transmission system.

*Provided by the Canadian Energy Research Institute (CERI).*

**Making Hole:** Means drilling.

*Provided by the Canadian Energy Research Institute (CERI).*

**Manufactured Gas:** A gas obtained by destructive distillation of coal, by the thermal decomposition of oil, or by the reaction of steam passing through a bed of heated coal or coke. Examples are coal gases, coke or oven gases, producer gas, blast furnace gas, blue (water) gas, or carbureted water gas. The Btu content varies widely between the various types of manufactured gases.

*Provided by the Canadian Energy Research Institute (CERI).*

**Marketers:** A marketer is either: (i) a part of a natural gas production company (or a subsidiary) which sells gas to final consumers or distribution companies; or (ii) an independent corporation which purchases gas from one or more producers and resells it to final consumers or local distribution companies. The second type are also referred to as *aggregators*.

*Provided by the Canadian Energy Research Institute (CERI).*

**Maximum Daily Quantity (MDQ):** The maximum volume of gas that a buyer, seller, or transporter is obligated to receive or deliver at each receipt or delivery point or in the aggregate as required by their contract.

*Provided by the Canadian Energy Research Institute (CERI).*

**Maximum Efficient Rate (MER):** The maximum rate at which natural gas and crude oil can be produced without excessive decline of reservoir energy or a loss in ultimate production.

*Provided by the Canadian Energy Research Institute (CERI).*

**Measurement-while-drilling (MWD) Tool:** Technology that transmits information from downhole measuring devices to the surface while drilling is ongoing.

**Medium Crude Oil:** Liquid petroleum with a density between that of light and heavy crude oil.

**Methane (CH<sub>4</sub>):** The simplest hydrocarbon and the main component of natural gas; methane is also produced when organic matter decomposes.

**Midstream:** The processing, storage and transportation sector of the petroleum industry.

**Migration:** The movement of natural gas, crude oil and/or water through porous and permeable rock.

*Provided by the Canadian Energy Research Institute (CERI).*

**Mineral Rights:** The rights to explore for and produce the resources below the surface. In the

petroleum industry, mineral rights can also be referred to as “land”.

**Miscible Flooding:** An oil-recovery process in which a fluid, capable of mixing completely with the oil it contacts, is injected into an oil reservoir to increase recovery.

**Mousehole:** A hole drilled to the side of the wellbore to hold the next joint of drill pipe to be used; when this joint is pulled out and screwed onto the drill string, another joint of pipe is readied and slipped into the mousehole to await its turn.

**Mud:** Usually colloidal suspensions of clays in water with chemical additives that is circulated through the well bore during rotary drilling.

*Provided by the Canadian Energy Research Institute (CERI).*

**Mud Motor:** A downhole drilling motor that is powered by the force of the drilling mud pushed through the motor by the mud pumps at the surface.

**Multiple Entry:** A technique for drilling several horizontal wells from a single vertical, directional or horizontal wellbore.

**Multiple Zone Well Completion:** Completion of a well in such a way that production is obtained from several different formations.

*Provided by the Canadian Energy Research Institute (CERI).*

**Naphtha:** A light fraction of crude oil used to make gasoline.

**National Energy Board (NEB):** The federal regulatory agency in Canada which authorizes

oil, natural gas, and electricity exports; certifies interprovincial and international pipelines, and designated interprovincial and international power lines; and sets tolls and tariffs for oil and gas pipelines under federal jurisdiction.

*Provided by the Canadian Energy Research Institute (CERI).*

**Natural Gas Liquids (NGLs):** Liquids obtained during natural gas production and processing; they include ethane, propane, butane and condensate.

**Netback Price:** The effective price received by the producer after subtracting the cost of shipping (if paid for by the producer).

*Provided by the Canadian Energy Research Institute (CERI).*

**Nitrous Oxide (N<sub>2</sub>O):** A very potent greenhouse gas which has a large number of natural sources and is a secondary product of the burning of organic material and fossil fuels.

**Nomination:** A buyer's or shipper's request for service under an existing agreement. For example, shippers nominate the volume of gas they would like to have transported on a daily, weekly, and/or monthly basis.

*Provided by the Canadian Energy Research Institute (CERI).*

**Non-Associated Gas:** A reservoir where only gas is found (i.e., crude oil is not present).

*Provided by the Canadian Energy Research Institute (CERI).*

**Non-Conventional Gas:** See *unconventional gas*.

*Provided by the Canadian Energy Research Institute (CERI).*

**Non-Hydrocarbon Gases:** Typical non-hydrocarbon gases which may be present in natural gas are carbon dioxide, nitrogen, hydrogen sulfide and helium.

*Provided by the Canadian Energy Research Institute (CERI).*

**Non-Utility Generators (NUGS):** As the name suggests, they are non-utility entities which generate electricity. In the U.S., NUGs are further divided into two categories: cogenerators and IPPs. In Canada, all three terms are used interchangeably.

*Provided by the Canadian Energy Research Institute (CERI).*

**Octane:** A performance rating of gasoline; the higher the octane number, the greater the anti-knock quality of the gasoline.

**Oil Sands:** A deposit of sand saturated with bitumen.

**Open Access Transporter:** A gathering/transmission/distribution system that transports gas on a non-discriminatory basis to any party that wishes to contract for the gas.

*Provided by the Canadian Energy Research Institute (CERI).*

**Operator:** The company or individual responsible for managing an exploration, development or production operation.

**Outer Continental Shelf (OCS):** The submerged lands in the U.S. extending from 3 miles offshore to some undefined outer limit,

usually a depth of 200 meters. It is the portion of the shelf under federal U.S. jurisdiction.

*Provided by the Canadian Energy Research Institute (CERI).*

**Packer:** An expanding plug used in a well to seal off certain sections of the tubing or casing when cementing and acidizing or when a production formation is to be isolated.

**Paleontologist:** A person trained in paleontology – the study of plant and animal life in past geological time through the study of fossil plants and animals, their relationship to present-day plants and animals and their environments.

**Palynologist:** A paleontologist who specializes in fossil pollens and spores.

**Partial Looping:** A method for increasing the capacity of a pipeline. A series of pipe sections are constructed parallel to the main pipeline for a portion of the distance between compressor or pump stations and connecting them to the main pipeline at the beginning and end of each segment. This reduces pressure drop in the portions of the pipeline that are "looped" (i.e., with parallel sections), allowing an increased pressure drop in the unlooped sections and, thus, an increased flow rate. Over time, a series of partial loops may be constructed resulting in a complete, second, parallel pipeline.

*Provided by the Canadian Energy Research Institute (CERI).*

**Pay Zone:** The producing part of a formation.

*Provided by the Canadian Energy Research Institute (CERI).*

**Peak Day Demand:** The one-day (24-hour period) of maximum system deliveries of gas during a year.

*Provided by the Canadian Energy Research Institute (CERI).*

**Peak Shaving:** The use of fuels and equipment to generate or manufacture gas to supplement the normal supply of pipeline gas during periods of extremely high demand. This method prevents the expensive alternative of expanding pipeline facilities. It can also refer to other measures, such as demand-side management programs, which seek to reduce consumption at peak times.

*Provided by the Canadian Energy Research Institute (CERI).*

**Perforate:** Make holes through the casing opposite the producing formation to allow the oil or gas to flow into the well.

**Perforating Gun:** A special tool used downhole for shooting holes in the well's casing opposite the producing formation.

**Permeability:** The capacity of a reservoir rock to transmit fluids; how easily fluids can pass through rock.

**Petrochemicals:** Chemicals derived from petroleum that are used as feedstocks for the manufacture of a variety of plastics and other products such as synthetic rubber.

**Petroleum:** A naturally occurring mixture composed predominantly of hydrocarbons in the gaseous, liquid or solid phase.

**Pig:** A cylindrical device inserted into a pipeline to inspect the pipe or to sweep the line clean of water, rust or other foreign matter; pipeline inspection and cleaning devices are called pigs because early models squealed as

they moved through the pipe. A “smart pig” is also equipped to find corrosion, cracks or weakness in the welding.

**Pinnacle Reef:** A conical formation, higher than it is wide, usually composed of limestone, in which hydrocarbons might be trapped.

**Pipeline:** All parts of the physical facility through which gas is moved in transportation, including pipe, valves, and other appurtenances attached to the pipe, compressor units, metering stations, regulator stations, delivery stations, holders, and fabricated assemblies.

*Provided by the Canadian Energy Research Institute (CERI).*

**Pipeline Fuel:** Natural gas consumed in the operation of a natural gas pipeline, primarily in compressors.

*Provided by the Canadian Energy Research Institute (CERI).*

**Pipeline Quality Gas:** A term used to indicate that natural gas has been processed sufficiently to meet the standards of a gathering/transmission/distribution pipeline system.

*Provided by the Canadian Energy Research Institute (CERI).*

**Pool:** A natural underground reservoir containing an accumulation of petroleum.

**Pooling Agreement:** When the boundaries of two or more oil/gas leases do not coincide with the drill spacing unit, then a pooling agreement is needed among the lease holders before the conservation commission will grant a drill permit.

*Provided by the Canadian Energy Research Institute (CERI).*

**Porosity:** The volume of spaces within rock that might contain oil and gas (like the amount of water a sponge can hold); the open or void space within rock – usually expressed as a percentage of the total rock volume. Thus porosity measures the capacity of the rock to hold natural gas, crude oil or water.

**Postage Stamp Rates:** A single rate for the entire system; in contrast to a zone for mileage based rates.

*Provided by the Canadian Energy Research Institute (CERI).*

**Potential Resources:** The volume of natural gas that is thought to exist based on geological knowledge, but has not been proven to exist though geophysical techniques or drilling.

*Provided by the Canadian Energy Research Institute (CERI).*

**Precambrian:** Formed prior to the Cambrian era approximately 600 million years ago.

**Primary Recovery:** The production of oil and gas from reservoirs using the natural energy available in the reservoirs and pumping techniques.

**Probable Reserves:** Hydrocarbon deposits believed to exist with reasonable certainty on the basis of geological information.

**Production:** The operation of bringing raw natural gas to the surface for processing.

*Provided by the Canadian Energy Research Institute (CERI).*

**Production Casing:** The last string of casing set in a well; production casing is tubular steel pipe connected by threads and couplings that lines the total length of the wellbore to ensure safe control of production, prevent water from entering the wellbore and keep rock formations from “sloughing” into the wellbore.

**Production Tubing:** Steel pipe inside the casing used to flow the petroleum from the producing zone to the surface.

**Productive Capacity:** The estimated maximum volume which can be produced from known reserves based on reservoir characteristics, economic considerations, regulatory limitations and the feasibility of infill drilling or additional production facilities; also known as available supply.

**Prospect:** A geographical area which exploration has shown contains sedimentary rocks and structures favorable for the presence of crude oil or natural gas.

*Provided by the Canadian Energy Research Institute (CERI).*

**Proved Reserves:** Hydrocarbons in known reservoirs that can be recovered with a great degree of certainty under existing technological and economic conditions. The category of natural gas reserves that have the highest probability of being produced. Generally, the reserves have been “proved” to exist with drilling evidence. Each authority has a slightly different definition of the exact parameters which define proved reserves. In Canada some authorities use the term “established” reserves.

**Public Consultation:** The process of involving all affected parties in the design, planning and operation of a seismic program,

an oil and gas well, pipeline, processing plant or other facility.

**Public Interest:** Usually intended to mean the interest of the public generally as opposed to the interest of an individual or company.

*Provided by the Canadian Energy Research Institute (CERI).*

**Public Utility:** A business organization which performs a service that affects all of the people within a specified area. Public Utility's are usually established under the provisions of a franchise, charter or certificate and are subject to special governmental regulations. It can also be called a *local distribution company (LDC)*.  
*Provided by the Canadian Energy Research Institute (CERI).*

**Public Utility Commission (PUC):** State government agencies that regulate various aspects of public utilities (such as natural gas, electricity, water, etc). Sometimes they are called by different names, such as a Public Utilities Board, the Oklahoma Corporation Commission, or the Texas Railroad Commission.

*Provided by the Canadian Energy Research Institute (CERI).*

**Quad:** An energy quantity of one quadrillion Btu, which is approximately the energy equivalent contained in one trillion cubic feet of natural gas.

*Provided by the Canadian Energy Research Institute (CERI).*

**R/P Ratio:** The reserves-to-production (R/P) ratio measures the length of time current proved/ established reserves would last if current production rates were maintained and

no new reserves were added. Essentially, it measures the "ready inventory of gas".

*Provided by the Canadian Energy Research Institute (CERI).*

**Rate Base:** The value (determined by a public utility commission) upon which a gathering, transmission and/or distribution company is allowed to earn a specified rate of return. Generally the value is based on the amount of property used and useful in providing service and may be based on fair value, prudent investment, reproduction cost or original cost. The rate base may include a working capital allowance covering such items as cash, working capital, materials and supplies, prepayments, minimum bank balances and tax offsets. The rate base may be adjusted for depreciation, contributions in aid of construction, accumulated deferred income taxes and accumulated deferred investment tax credits.

*Provided by the Canadian Energy Research Institute (CERI).*

**Rate Design:** The term rate design refers to the method of classifying fixed and variable costs between demand and commodity components. For example, modified fixed variable or straight fixed variable.

*Provided by the Canadian Energy Research Institute (CERI).*

**Rate of Return (ROR):** The return allowed to be earned (generally based on the cost of capital determination) or actually earned by a utility company. The rate of return is generally calculated by dividing the net operating income (as defined) by the rate base.

*Provided by the Canadian Energy Research Institute (CERI).*

**Rathole:** A slanted hole drilled near the wellbore to hold the kelly joint when not in use; the kelly is unscrewed from the drill string and lowered into the rathole.

**Raw Natural Gas:** A mixture containing methane plus all or some of the following: ethane, propane, butane, pentanes, condensates, nitrogen, carbon dioxide, hydrogen sulfide, helium, hydrogen, water vapour and minor impurities. Raw natural gas is the gas found naturally in the ground prior to processing.

*Provided by the Canadian Energy Research Institute (CERI).*

**Receipt Point:** The location where gas enters a transporter's system from a well, plant or pipeline interconnect.

*Provided by the Canadian Energy Research Institute (CERI).*

**Recoverable Resources:** Hydrocarbon reserves that can be produced with current technology including those not economical to produce at present.

**Repressuring:** Forcing gas, under pressure, into a crude oil reservoir in an attempt to increase the recovery of crude oil. This can also be achieved using water.

*Provided by the Canadian Energy Research Institute (CERI).*

**Reserves Life Index:** See *R/P ratio*.

*Provided by the Canadian Energy Research Institute (CERI).*

**Reservoir (pool):** A porous and permeable underground rock formation containing a

natural accumulation of crude oil or natural gas that is confined by impermeable rock or water barriers, and is separate from other reservoirs.

**Residential Sector:** Natural gas consumers who purchase gas for use in their home (which includes private houses, small multi-unit townhomes, and larger residential units with individually metered apartments). Natural gas is primarily used for space and water heating in the residential sector.

*Provided by the Canadian Energy Research Institute (CERI).*

**Residuuum:** A heavy, black, tar-like substance that remains after crude oil has been fully refined to distil all usable fractions or components.

**Resource Base:** See *ultimate potential*.

*Provided by the Canadian Energy Research Institute (CERI).*

**Resource Dynamics:** The forces that affect the size of the resource base (e.g., technology, natural gas prices, production costs, etc.).

*Provided by the Canadian Energy Research Institute (CERI).*

**Revenue Requirement:** The amount of revenue a company needs to receive in order to cover their operating expenses, pay debt service and provide a fair return to common equity investors.

*Provided by the Canadian Energy Research Institute (CERI).*

**Rigging Up:** Before the work of drilling can be started but after the derrick has been built (or setup), tools and machinery must be

installed and a supply of fuel and water must be established. This operation, which in substance is that of getting the rig ready, is called "rigging up".

*Provided by the Canadian Energy Research Institute (CERI).*

**Right-of-Way:** A strip of land, the use of which is acquired for the construction and operation of a pipeline or some other facility, may be owned outright or an easement taken for a specific purpose.

*Provided by the Canadian Energy Research Institute (CERI).*

**Rig (Jackknife or Folding Mast):** The type of mast that can be folded for moving, as opposed to the standard derrick, which has to be completely dismantled and re-erected.

*Provided by the Canadian Energy Research Institute (CERI).*

**Rod String:** A string of steel rods used to provide up and down motion for a bottom-hole pump to lift oil to the surface.

**Rolled-in Tolls:** A toll whereby the cost of an expansion is "rolled into" the overall costs to operate the pipeline. It is one method of creating tolls for an expansion of a pipeline system. See also *incremental tolls*.

*Provided by the Canadian Energy Research Institute (CERI).*

**Rotary Bit:** The cutting tool attached to the lower end of the drill pipe of a rotary drilling rig. The bit does the actual drilling of the hole through the formation.

*Provided by the Canadian Energy Research Institute (CERI).*

**Rotary Drilling:** A method for drilling wells using a cutting bit attached to a revolving drill pipe.

*Provided by the Canadian Energy Research Institute (CERI).*

**Rotary Rig:** A modern drilling unit capable of drilling a well with a bit attached to a rotating column of steel pipe.

**Rotary Table:** A heavy, circular casting mounted on a steel platform just above the rig floor which rotates the drill string and thus turns the bit.

**Royalty:** The owner's share of production or revenues retained by government or freehold mineral rights holders. In natural gas operations, the royalty is usually based on a percentage of the total production.

**Salt Cavern:** An underground natural gas storage cavern which has been developed in a salt dome by the solution mining process.

*Provided by the Canadian Energy Research Institute (CERI).*

**Sandstone:** A compacted sedimentary rock composed mainly of quartz or feldspar; a common rock in which oil, natural gas and/or water accumulate.

**Secondary Recovery:** The extraction of additional crude oil, natural gas and related substances from reservoirs through pressure maintenance techniques such as waterflooding and gas injection.

**Sedimentary Rocks:** Rocks formed by the accumulation of sediment or organic materials and therefore likely to contain hydrocarbons.

**Seismic Surveys:** Refers to studies done to gather and record patterns of induced shock wave reflections from underground layers of rock which are used to create detailed models of the underlying geological structure.

**Seismograph:** A device for detecting vibrations in the earth. It is used in prospecting for probable oil or gas bearing structures. In this application, the vibrations are created by discharging explosives in shallow bore holes. The nature and velocity of the vibrations as recorded by the seismograph indicate the general nature of the section of earth through which the vibrations pass.

*Provided by the Canadian Energy Research Institute (CERI).*

**Set Casing:** To install steel pipe or casing in a well bore. An accompanying operation is the cementing of the casing in place by surrounding it with a wall of cement extending for all or part of the depth of the well.

*Provided by the Canadian Energy Research Institute (CERI).*

**Service Rig:** A truck-mounted rig, usually smaller than a drilling rig, that is brought in to complete a well or to perform maintenance, replace equipment or improve production.

**Shale:** Rock formed from clay.

**Shale Shaker:** A vibrating screen for sifting out rock cuttings from drilling mud.

**Shipper:** An individual or company that contracts with a gathering, transmission or distribution system for transportation of customer-owned natural gas. The shipper retains ownership of the natural gas while it is being transported.

*Provided by the Canadian Energy Research Institute (CERI).*

**Shrinkage:** The reduction in volume of wet natural gas due to the extraction of some of its constituents, such as hydrocarbon products, hydrogen sulphide, carbon dioxide, nitrogen, helium and water vapour.

*Provided by the Canadian Energy Research Institute (CERI).*

**Shut-in Gas Well:** A well that has been completed but is not producing natural gas. A well may be shut-in for tests, repairs, to await construction of gathering lines, or better economic conditions.

*Provided by the Canadian Energy Research Institute (CERI).*

**Sidetrack:** A section of a well drilled on a curve to bypass debris or other obstructions.

**Smart Pig:** Sophisticated instrument packages sent through pipelines to test for corrosion and buckling.

**Solution Gas:** When natural gas in the reservoir is dissolved into crude oil.

*Provided by the Canadian Energy Research Institute (CERI).*

**Sour Gas:** Raw natural gas with a relatively high concentration of sulphur compounds, such as hydrogen sulfide.

*Provided by the Canadian Energy Research Institute (CERI).*

**Sour Oil:** Crude oil containing free sulphur, hydrogen sulphide or other sulphur compounds.

**Spot Market:** A market characterized by short-term contracts for specified volumes of gas. Participants may be producers, *marketers*, *brokers*, *LDCs* or end-users.

*Provided by the Canadian Energy Research Institute (CERI).*

**Spudding In:** Beginning to drill a well.

**Steam-Assisted Gravity Drainage (SAGD):** A recovery technique for extraction of heavy oil or bitumen that involves drilling a pair of horizontal wells one above the other; one well is used for steam injection and the other for production.

**Steam Injection:** An improved recovery technique in which steam is injected into a reservoir to reduce the viscosity of the crude oil.

**Stimulating The Formation:** A technique for improving production from a reservoir; stimulation may involve acidizing, fracturing or simply cleaning out sand.

**Storage Facilities:** Facilities used for storing natural gas. They generally come in two forms: gaseous storage facilities and liquefied natural gas (LNG) storage facilities. Gaseous storage facilities are usually salt caverns or depleted natural gas or crude oil reservoirs.

*Provided by the Canadian Energy Research Institute (CERI).*

**Storage Service:** Storage service allow a person/company to store natural gas for a set period of time. Storage services are usually contracted for and generally a separate fee is charged for injection and withdrawal of the gas.

*Provided by the Canadian Energy Research Institute (CERI).*

**Straddle Extraction Plant:** A gas processing plant located on or near a gas transmission line that removes natural gas liquids from the gas and returns it to the line.

**Sulphur:** A yellow mineral extracted from petroleum for making fertilizers, pharmaceuticals and other products.

**Sulphur Dioxide (SO<sub>2</sub>):** A poisonous gas formed by burning hydrogen sulphide.

**Supply Bubble:** See *excess deliverability*.

*Provided by the Canadian Energy Research Institute (CERI).*

**Surface Casing:** The first string of casing put into a well; it is cemented into place and serves to shut out shallow water formations and as a foundation for well control.

**Surface Rights:** The rights to work on the surface of the land.

**Sustainable Development:** Development that meets the needs of the present without compromising the ability of future generations to meet their own needs (as defined by United Nations World Commission on Environment and Development).

**Sweeten:** Remove hydrogen sulphide and carbon dioxide from sour gas to make it marketable.

**Sweet Gas:** Raw natural gas with a relatively low concentration of sulphur compounds, such as hydrogen sulfide.

*Provided by the Canadian Energy Research Institute (CERI).*

**Synthetic Crude Oil:** A mixture of hydrocarbons, similar to crude oil, derived by upgrading bitumen from oil sands.

**Take-or-Pay Clause:** A clause that requires a minimum quantity of gas to be paid for, whether or not the gas is actually taken by the purchaser.

*Provided by the Canadian Energy Research Institute (CERI).*

**Tertiary Recovery:** The third major phase of crude oil recovery which involves using more sophisticated techniques, such as steam flooding or injection of chemicals, to increase recovery.

**Therm:** A unit of heating value equivalent to 100,000 Btu. This term is used frequently in the U.S.

*Provided by the Canadian Energy Research Institute (CERI).*

**Tight Gas:** Gas with very low flow rates found in sedimentary layers of rock that are cemented together so tight that it “greatly hinders” the extraction. Getting tight gas out usually requires enhanced technology like “hydraulic fracturing” where fluid is pumped into the ground to make it more permeable. The National Energy Board estimates Canada could have between 89 and 1500 trillion cubic feet (tcf) of tight gas, compared to total gas estimates (excluding tight gas) of 733 tcf.

**Tight Sands Gas:** Natural gas that is found in geological formations with low permeability (i.e., the ability of the natural gas to move through the rock structure).

*Provided by the Canadian Energy Research Institute (CERI).*

**Top Drives:** Hydraulic or electric motors that are suspended in the derrick above the rig floor to rotate the drill string and bit.

**Transmission System:** Pipelines that transport natural gas over long distances (usually from supply to market regions or to other transmission systems). A transmission system usually has a linear configuration, large diameter pipe, and they operate at high pressures.

*Provided by the Canadian Energy Research Institute (CERI).*

**Transmission Pipelines:** A collection of pipeline facilities which transport natural gas from a supply region to a city-gate, large volume customer or another transmission line. These systems include transmission lines and compressor stations.

*Provided by the Canadian Energy Research Institute (CERI).*

**Transportation Service (T-Service):** A service provided by a pipeline or LDC to transport a consumer's gas. The service may be firm or interruptible.

*Provided by the Canadian Energy Research Institute (CERI).*

**Traps:** A mass of porous, permeable rock – sealed on top and both sides by non-porous, impermeable rock – that halts the migration of oil and gas, causing them to accumulate.

**Tripping:** The process of removing the drill string from the hole to change the bit and running the drill string and new bit back into the hole.

**Trunk Lines:** Large-diameter pipelines that transport crude oil, natural gas liquids and

refined petroleum products to refineries and petrochemical plants; some trunk lines also transport refined products to consuming areas.

**Ultimate Potential:** The sum of cumulative production, established/proved reserves, and undiscovered/potential resources. It is sometimes referred to as the Resource Base.

*Provided by the Canadian Energy Research Institute (CERI).*

**Ultimate Potential Resources:** An estimate of all the resources that may become recoverable or marketable, having regard for the geological prospects and anticipated technology. It consists of cumulative production, remaining established reserves, discovered resources and undiscovered resources.

*Provided by the National Energy Board (NEB).*

**Unaccounted For Gas:** The difference between the total gas available from all sources, and the total gas accounted for as sales, net interchange, and company use. This difference includes leakage or other actual losses, discrepancies due to meter inaccuracies, variations of temperature and/or pressure, and other variants, particularly due to measurements being made at different times.

*Provided by the Canadian Energy Research Institute (CERI).*

**Unitization:** Joint operation of several leases, usually for economic or conservation reasons. A whole pool or field may be unitized to prevent unnecessary drilling and to conduct secondary recovery projects.

*Provided by the Canadian Energy Research Institute (CERI).*

**Unbundled Service:** The separation of pipeline services into discrete components (e.g., transportation, storage, gathering, sales, etc.). Separate fees are charged for each service, based upon only the cost of providing that service.

*Provided by the Canadian Energy Research Institute (CERI).*

**Unconventional Gas:** Natural gas that requires specialized technology to remove it from the ground. Unconventional gas sources are generally categorized as tight sands gas, shale gas or coal bed methane. The distinction between unconventional and conventional gas is becoming less clear.

*Provided by the Canadian Energy Research Institute (CERI).*

**Underbalanced Drilling:** Using mud lightened by the addition of nitrogen or other gas to minimize damage to the producing reservoir by drilling fluids.

**Unitization:** Process whereby owners of adjoining properties pool reserves into a single unit operated by one of the owners; production is divided among the owners according to the unitization agreement.

**Upgrading:** The process of converting heavy oil or bitumen into synthetic crude oil.

**Upstream:** The exploration and production sector of the petroleum industry.

**Variable Costs:** Operating costs which, in the aggregate, vary either directly or indirectly in relation to any change in the volume of gas sold and/or transported. For example, the fuel used and expenses incurred by compressor stations.

*Provided by the Canadian Energy Research Institute (CERI).*

**V-door:** The opening in the derrick opposite the drawworks used for bringing in drill pipe and casing from the nearby pipe racks.

**Vibroiseis:** The process of producing seismic shock waves with “thumpers” or vibrator vehicles.

**Viscosity:** The resistance to flow or “stickiness” of a fluid.

**Volatile Organic Compounds (VOCs):** Gases and vapours, such as benzene, released by petroleum refineries, petrochemical plants, plastics manufacturing and the distribution and use of gasoline; VOCs include carcinogens and chemicals which react with sunlight and nitrogen oxides to form ground-level ozone, a component of smog.

**Weighted Average Cost of Gas (WACOG):** The weighted average unit cost of various supplies of natural gas. It is calculated as the total cost of all natural gas purchased during a period divided by the total quantity. This term is usually used in reference to an LDC.

*Provided by the Canadian Energy Research Institute (CERI).*

**Wellbore:** A hole drilled or bored into the earth, usually cased with metal pipe, for the production of gas or oil.

**Wellhead:** The equipment used to maintain surface control of a well.

**Well-logging Instruments:** Instruments lowered into a well to provide specific information on the condition of the well.

**Western Canada Sedimentary Basin:**

Canada’s largest region of sedimentary rocks; the largest source of current oil and gas production.

**Wet Gas:** Raw natural gas with a relatively high concentration of natural gas liquids (ethane, propane, butane, pentanes and condensates).

*Provided by the Canadian Energy Research Institute (CERI).*

**Wildcat:** A well drilled in an area where no oil or gas production exists nearby.

**Wildcatting:** Exploring for crude oil and/or natural gas in previously unexplored areas.

*Provided by the Canadian Energy Research Institute (CERI).*

**Wireline Logging Tools:** Special tools or equipment, such as logging tools, packers or measuring devices, designed to be lowered into the well on a wireline (small-diameter steel cable).

**Working Gas:** The gas in a gaseous storage facility that is available for market. Also see *cushion gas*.

*Provided by the Canadian Energy Research Institute (CERI).*

**Working Interest:** The interest in a mineral property that entitles the owner to a portion of the production from the property. A working interest may entitle the owner to royalty payments.

*Provided by the Canadian Energy Research Institute (CERI).*