

Coal Glossary

Anthracite - See "Ranks of Coal."

Auger Mining - A method of mining usually, but not necessarily, following a surface mining operation where the overburden becomes too costly to remove. A large auger, similar to that used by a carpenter when boring a hole in the sod, is used to remove the coal from the seam. The auger usually operates on a horizontal plane, comes in sections, and the diameter depends on the height of coal.

Backfill - Operation of refilling an area where overburden has been removed, including the grading of the refilled excavation. Also, the material placed in an excavation in the process of backfilling.

Bitumen - A general name for various solid and semisolid hydrocarbons; a native substance of dark color, comparatively hard and nonvolatile, composed principally of hydrocarbons. Bituminous Coal - See "Ranks of Coal."

Btu - British Thermal Unit. A measure of the energy required to raise the temperature of one pound of water by one degree Fahrenheit.

Byproducts - Useful substances made from the gases and liquids left over when coal is changed into coke.

Captive Mine - One whose coal is taken largely or wholly by its owner for their own use or use by a subsidiary.

Coal Miners - Some 1,170,000 men and women are available to mine coal in the U.S. today. About 60 percent of all miners are members of the United Mine Workers of America. However, because of its predominance in underground mining, UMWA production is currently only about 40 percent of total U.S. production.

Coal Resources - Total coal deposits, regardless of whether they can now be mined or recovered. The U.S. may have as much as 4 trillion tons of coal resources, according to the U.S. Geological Survey.

Coal Seam - A bed or stratum of coal; usually applied to large deposits of coal.

Coal Washing - The process of separating coal of various sizes, densities and shapes by allowing them to settle in a fluid.

Coke - A hard, dry carbon substance produced by heating coal to a very high temperature in the absence of air; used in the manufacture of iron and steel.

Continuous Mining - Underground Mining method using a machine that does the entire coal extracting job, eliminating the traditional four-step cycle of cutting, drilling, blasting and loading. The continuous mining machine moves up to the seam, cuts coal from the solid seam and simultaneously conveys it to a shuttle or conveyor belt for removal from the mine.

Conventional Mining - An underground mining method involving a series of steps, three of which require special machinery. First, a cutting machine cuts a deep slit along the base of the coal face. Another machine drills holes into the face. Miners load the holes with explosives and set the explosives off. The undercutting along the bottom of the face causes the shattered coal to fall to the floor where it is retrieved and loaded onto a conveyor belt by a loading machine.

Deep Mine - An underground coal mine.

Demonstrated Reserves - Coal deposits which are potentially mineable on an economic basis with existing technology. The U.S. Department of Energy estimates there are about 475 billion tons of demonstrated reserves in the U.S.

Dragline - A large machine used to remove the overburden from a coal seam in surface mining; a dragline sits on an earthen shelf above the coal, and uses a giant bucket suspended from cables to scrape up and remove the dirt and rock covering the coal. (The bucket is dragged toward the machine by "lines" or cables, hence the name.)

Drift Mine - A coal mine entered directly through a horizontal opening.

Electrostatic Precipitator - An electrical device for removing particles (fly ash) from combustion gases prior to release from a power plant's stack.

Face - Place inside the mine where the coal seam is being worked; the front surface of the coal in either deep or surface mines.

Fluidized Bed Combustion - A process which removes sulfur from coal during combustion. In a fluidized bed boiler, crushed coal and limestone are suspended in the bottom of a boiler by an upward stream of hot air. The coal is burned in this ebullient, liquid-like mixture, hence the name - fluidized. As the coal burns, sulfur gases from the coal combine with limestone to form a solid compound that is recovered with the ash.

Fly Ash - The finely divided particles of ash entrained in the flue gases arising from the combustion of fuel.

Fossil Fuel - Any naturally occurring fuel of an organic nature, such as coal, crude oil, and natural gas.

Gasification - Any of various processes by which coal is turned into low, medium and high Btu gas.

Haulageway - Main transportation tunnel for underground mines in which rail tracks have been laid for mine cars.

Highwall - Unexcavated face of exposes overburden and coal in a surface mine or in the face or bank on the uphill side of a contour mine excavation.

Hopper Cars - Open freight cars with a floor sloping to one or more hinged doors for discharging bulk materials, particularly coal.

In-Situ Gasification - In-place conversion of coal to gas by partial underground combustion, without removal of the coal itself.

Lignite - See "Ranks of Coal."

Liquefaction - Converting coal into synthetic liquid fuel, similar in nature to crude oil and/or refined products such as gasoline.

Longwall Mining - A method of underground mining in which a steel plow or rotating cutting drum is mechanically pulled back and forth across a face of coal usually several hundred feet long, with the loosened coal falling onto a conveyor.

Magnetohydrodynamics - Also known as MHD. Coal and preheated air are fired in a low-resistance time burner at very high temperatures. Potassium salts are added, producing a gas of high conductivity. The gas is then passed through a magnetic field, producing electricity. This process is still in the research stage.

Man Car - Vehicle that transports miners to sections or work area.

Metallurgical Coal - The types of coal carbonized to make coke for steel manufacture. Four important qualities for "met" coal are Volatility, which affects coke yield; the level of Impurities, which affects coke quality; Composition, which affects coke strength; and basic Characteristics, which affect coke oven safety. Metallurgical coal has a particularly high Btu, but low ash content.

Methane - A gas formed naturally from the decay of vegetative matter, which also forms coal.

Mine-Mouth Plant - Commonly, a steam-electric power plant built close to a coal mine which delivers its electricity output to a distant point by transmission lines.

Outcrop - Coal which appears at or near the surface; the intersection of a coal seam with the surface.

Overburden - Layers of dirt and rock covering a coal seam. Removed and then replaced during surface mining.

Portal - Any entrance to the mine.

Preparation Point - Usually located on a mine site, although one plant may serve several mines. Facility for crushing, sizing, and washing coal to prepare it for use by a particular customer.

Ranks of Coal - Classification of coal by degree of hardness, moisture and heat content; Anthracite is a hard coal, almost pure carbon, used mainly for heating homes; Bituminous is soft coal, the most common type in the U.S., used to generate electricity and to make coke for the steel industry; Lignite is the softest coal and has the highest moisture content. It is being used more for generating electricity in certain areas of the country and for conversion into synthetic gas. Subbituminous is a coal with a heating value between bituminous and lignite, and has a low fixed carbon and high percentages of volatile matter and moisture. In terms of Btu content, anthracite has the highest, followed by bituminous coal, subbituminous and lignite.

Reclamation - Restoring land and environmental values after mining. Commonly includes recontouring the land, restoring the topsoil, and planting grasses and ground covers. Usual goal is new or increased agricultural or recreational uses for mined land.

Recoverable Reserves - The amount of coal that can be recovered from the demonstrated reserve base. The recovery factor for underground mines is about 57 percent and from surface mines about 80 percent. It is reasonably estimated that about 306 billion tons of the U.S. demonstrated reserve base can now be recovered.

Rock Dusting - Process of coating the tunnels in underground mines with powdered limestone. This dilutes possible concentrations of coal dust and helps to minimize explosion hazards.

Roof Bolting - Method of supporting the ceilings of underground mines by inserting long steel bolts into holes bored into the strata forming the roof.

Run-of-Mine Coal - Coal as it comes from the mine, not treated at a preparation plant.

Scrubber - Any of several forms of chemical/physical devices which operate to remove sulfur compounds formed during coal combustion. These devices combine the sulfur in gaseous emissions with another chemical medium to form inert "sludge" which must then be removed for disposal.

Self-Contained Self-Rescuer - A device, required by law to be available to all persons working in or visiting underground coal mines, for escaping from poisonous atmospheres during a mine emergency. This device provides a minimum of sixty minutes of oxygen supply.

Self-Rescuer (filter type) - Canister-like device carried by underground miners for immediate emergency use in case of mine fire or explosion. By breathing through the filter highly toxic carbon monoxide is converted into harmless carbon dioxide.

Shortwall - Mining method in which small areas are worked by means of a continuous miner and the roof is supported by jacks and permitted to fall as mining advances, as with the longwall method.

Shuttle Car - Self-discharging truck, generally with rubber tires or caterpillar-type treads, for receiving coal from the loading and/or mining machine for transport to the underground loading point, mine railway or belt conveyor system.

Slurry Pipeline - Pipeline for transporting viscous mixture of coal and liquid medium. Only one such line, a 273 mile system from Arizona to Nevada, is currently operating although several others have been proposed. Water is the medium now in use, but experiments with oil, liquid methane or carbon dioxide show promise of increased efficiency and reduced environmental concerns in areas where water supplies are scarce. These pipelines might also be used for short-haul-transport, such as from a port facility to a nearby power plant, reducing or eliminating the need for large stockpiles of coal.

Slope Mine - A mine with an inclined opening.

Steam Coal - Coal used under power plant and industrial steam boilers to produce electricity. Generally lower Btu content than metallurgical coal.

Subbituminous Coal - See "Ranks of Coal."

Surface Mine - A mine in which the coal lies near the surface and can be extracted by removing the covering layer of soil (overburden). About 60 percent of total U.S. coal production comes from surface mines.

Tipple - Surface processing structure for cleaning and sizing coal and automatically loading onto railway cars or trucks for movement to market.

Tons - A short or net ton is equal to 2,000 pounds, a long ton or British ton is 2,240 pounds; a metric ton is approximately 2,205 pounds.

Turbine - Machine in which rotating vanes are driven by a steam generator, which produces electricity.

Underground Mine - Deep mine, often located several hundred feet underground, in which the coal is removed with or no surface disturbance. Most are located east of the Mississippi River and account for about 40 percent of annual U.S. coal production.

Unit Train - Long train of 100 or more hopper cars carrying only coal between a mine and customer. A typical unit train can carry at least 10,000 tons of coal in a single shipment.

Volatile Matter - That portion which is driven off in gas or vapor form when coal is subjected to a standardized temperature test. It consists of hydrocarbons and other gases, resulting from distillation and decomposition of coal. It is the volatile matter which produces smoke when not completely burned off.