

GLOSSARY

This glossary of terms for the NPC report *Facing the Hard Truths about Energy* is based on a glossary provided by EIA, which the NPC has modified. The NPC appreciates EIA allowing the use of their document and assumes responsibility for any modifications that have been made to it.



Glossary

A

Acquisition (minerals): The procurement of the legal right to explore for and produce discovered minerals, if any, within a specific area; that legal right may be obtained by mineral lease, concession, or purchase of land and mineral rights or of mineral rights alone.

Acreage: An area, measured in acres, that is subject to ownership or control by those holding total or fractional shares of working interests. Acreage is considered developed when development has been completed.

Air pollution abatement equipment: Equipment used to reduce or eliminate airborne pollutants, including particulate matter (dust, smoke, fly, ash, dirt, etc.), sulfur oxides, nitrogen oxides, carbon monoxide, hydrocarbons, odors, and other pollutants. Examples of air pollution abatement structures and equipment include flue-gas particulate collectors, flue-gas desulfurization units and nitrogen oxide control devices.

Alcohol: The family name of a group of organic chemical compounds composed of a hydrocarbon plus a hydroxyl group (e.g., methanol, ethanol, and tertiary butyl alcohol).

Alternative fuel: Road transportation fuels other than petroleum gasoline and diesel, including:

- methanol
- ethanol and other alcohols
- fuel mixtures containing 85 percent or more by volume of methanol, denatured ethanol, and other alcohols with gasoline or other fuels
- natural gas
- liquefied petroleum gas (propane)

- hydrogen
- coal-derived liquid fuels
- gas-derived liquid fuels
- fuels (other than alcohol) derived from biological materials (biofuels such as soy diesel fuel)
- electricity (including electricity from solar energy).

Alternative-fuel vehicle: A vehicle designed to operate on an alternative fuel (e.g., compressed natural gas, methane blend, electricity). The vehicle could be either a dedicated vehicle designed to operate exclusively on alternative fuel or a nondedicated vehicle designed to operate on alternative fuel and/or a traditional fuel.

American Society for Testing and Materials (ASTM): ASTM International is an international standards developing organizations that develops and publishes voluntary technical standards (specifications, test methods, standard practice, and terminology) that define the requirements for a wide range of materials, products, systems, and services.

Anthracite: The highest rank of coal; used primarily for residential and commercial space heating. It is a hard, brittle, and black lustrous coal, often referred to as hard coal, containing a high percentage of fixed carbon and a low percentage of volatile matter. The moisture content of fresh-mined anthracite generally is less than 15 percent. The heat content of anthracite ranges from 22 to 28 million Btu per ton on a moist, mineral-matter-free basis. The heat content of anthracite coal consumed in the United States averages 25 million Btu per ton, on the as-received basis (i.e., containing both inherent moisture and mineral matter).

Anthropogenic: Made or generated by a human or caused by human activity. The term is used in the

context of global climate change to refer to gaseous emissions that are the result of human activities, as well as other potentially climate-altering activities, such as deforestation.

API gravity: American Petroleum Institute measure of specific gravity of crude oil or condensate, expressed in degrees. The measuring scale is calibrated in terms of degrees API; it is calculated as follows: Degrees API = $(141.5 / \text{sp.gr.}60 \text{ deg.F}/60 \text{ deg.F}) - 131.5$

Appliance: A piece of equipment, commonly powered by electricity, used to perform a particular energy-driven function. Examples of common appliances are refrigerators, clothes washers and dishwashers, conventional ranges/ovens and microwave ovens, humidifiers and dehumidifiers, toasters, radios, and televisions. *Note:* Appliances are ordinarily self-contained with respect to their function. Thus, equipment such as central heating and air conditioning systems and water heaters, which are connected to distribution systems inherent to their purposes, are not considered appliances.

Associated/dissolved natural gas: Natural gas that occurs in crude oil reservoirs either as free gas (associated) or as gas in solution with crude oil (dissolved gas).

ASTM: See **American Society for Testing and Materials**.

Automobile and truck classifications: Vehicle classifications for automobiles and light duty trucks as defined by the EPA (Environmental Protection Agency) mileage guide book. Almost every year there are small changes in the classifications, therefore the categories will change accordingly.

Average daily production: The ratio of the total production at a mining operation to the total number of production days worked at the operation.

Average vehicle miles traveled: A ratio estimate defined as total miles traveled by all vehicles, divided by: (1) the total number of vehicles (for average miles traveled per vehicle) or (2) the total number of households (for average miles traveled per household).

B

Barrel: A unit of volume equal to 42 U.S. gallons.

Base load: The minimum amount of electric power delivered or required over a given period of time at a steady rate.

Base load plant: A plant, usually housing high-efficiency steam-electric units, which is normally operated to take all or part of the minimum load of a system, and which consequently produces electricity at an essentially constant rate and runs continuously. These units are operated to maximize system mechanical and thermal efficiency and minimize system operating costs.

Biodiesel: Any liquid biofuel suitable as a diesel fuel substitute or diesel fuel additive or extender. Biodiesel fuels are typically made from oils such as soybeans, rapeseed, or sunflowers, or from animal tallow. Biodiesel can also be made from hydrocarbons derived from agricultural products such as rice hulls.

Biofuels: Liquid fuels and blending components produced from biomass (plant) feedstocks, used primarily for transportation.

Biomass: Organic nonfossil material of biological origin constituting a renewable energy source.

Bitumen: A naturally occurring viscous mixture, mainly of hydrocarbons heavier than pentane, that may contain sulfur compounds and that, in its natural occurring viscous state, is not recoverable at a commercial rate through a well.

Bituminous coal: A dense coal, usually black, sometimes dark brown, often with well-defined bands of bright and dull material, used primarily as fuel in steam-electric power generation, with substantial quantities also used for heat and power applications in manufacturing and to make coke. Bituminous coal is the most abundant coal in active U.S. mining regions. Its moisture content usually is less than 20 percent. The heat content of bituminous coal ranges from 21 to 30 million Btu per ton on a moist, mineral-matter-free basis. The heat content of bituminous coal consumed in the United States averages 24 million Btu per ton, on the as-received basis (i.e., containing both inherent moisture and mineral matter).

BOE: The abbreviation for barrels of oil equivalent (used internationally). Commonly 6.3 million British thermal units.

British thermal unit: The quantity of heat required to raise the temperature of 1 pound of liquid water by 1 degree Fahrenheit at the temperature at which water has its greatest density (approximately 39 degrees Fahrenheit).

C

Capacity factor: The ratio of the electrical energy produced by a generating unit for the period of time considered to the electrical energy that could have been produced at continuous full power operation during the same period.

Capacity utilization: Capacity utilization is computed by dividing production by productive capacity and multiplying by 100.

Carbon cycle: All carbon sinks and exchanges of carbon from one sink to another by various chemical, physical, geological, and biological processes. Also see **Carbon sink**.

Carbon dioxide (CO₂): A colorless, odorless, non-poisonous gas that is a normal part of Earth's atmosphere. Carbon dioxide is a product of fossil-fuel combustion as well as other processes. It is considered a greenhouse gas as it traps heat (infrared energy) radiated by the Earth into the atmosphere and thereby contributes to the potential for global warming. The global warming potential of other greenhouse gases is measured in relation to that of carbon dioxide, which by international scientific convention is assigned a value of one.

Carbon sequestration: The fixation of atmospheric carbon dioxide in a carbon sink through biological or physical processes.

Carbon sink: A reservoir that absorbs or takes up released carbon from another part of the carbon cycle. The four sinks, which are regions of the Earth within which carbon behaves in a systematic manner, are the atmosphere, terrestrial biosphere (usually including freshwater systems), oceans, and sediments (including fossil fuels).

Carburetor: A fuel delivery device for producing a proper mixture of gasoline vapor and air and for delivering it to the intake manifold of an internal combustion engine. Gasoline is gravity-fed from a reservoir bowl into a throttle bore, where it is allowed to evaporate into the stream of air being inducted by the engine.

Catalytic converter: A device containing a catalyst for converting automobile exhaust into mostly harmless products.

Climate change: A term used to refer to all forms of climatic inconsistency, but especially to significant change from one prevailing climatic condition to another. In some cases, "climate change" has been used synonymously with the term "global warming"; scientists, however, tend to use the term in a wider sense inclusive of natural changes in climate, including climatic cooling.

Coal: A readily combustible black or brownish-black rock whose composition, including inherent moisture, consists of more than 50 percent by weight and more than 70 percent by volume of carbonaceous material. It is formed from plant remains that have been compacted, hardened, chemically altered, and metamorphosed by heat and pressure over geologic time.

Coalbed degasification: This refers to the removal of methane or coalbed gas from a coal mine before or during mining.

Coalbed methane: Methane is generated during coal formation and is contained in the coal microstructure. Typical recovery entails pumping water out of the coal to allow the gas to escape. Methane is the principal component of natural gas. Coalbed methane can be added to natural gas pipelines without any special treatment.

Coal gasification: The process of converting coal into gas. The basic process involves crushing coal to a powder, which is then heated in the presence of steam and oxygen to produce a gas. The gas is then refined to reduce sulfur and other impurities. The gas can be used as a fuel or processed further and concentrated into chemical or liquid fuel.

Coal liquefaction: A chemical process that converts coal into clean-burning liquid hydrocarbons, such as synthetic crude oil and methanol.

Coal to liquids (CTL): The process of converting solid coal into a liquid hydrocarbon that may be used as a fuel or further refined into useful products.

Coal type: The classification is based on physical characteristics or microscopic constituents. Examples of coal types are banded coal, bright coal, cannel coal, and splint coal. The term is also used to classify coal according to heat and sulfur content.

Cofiring: The process of burning natural gas in conjunction with another fuel.

Cogeneration: The production of electrical energy and another form of useful energy (such as heat or steam) through the sequential use of energy.

Combined cycle: An electric generating technology in which electricity is produced from otherwise lost waste heat exiting from one or more gas (combustion) turbines. The exiting heat is routed to a conventional boiler or to a heat recovery steam generator for utilization by a steam turbine in the production of electricity. This process increases the efficiency of the electric generating unit.

Combined cycle unit: An electric generating unit that consists of one or more combustion turbines and one or more boilers with a portion of the required energy input to the boiler(s) provided by the exhaust gas of the combustion turbine(s).

Combined heat and power (CHP) plant: A plant designed to produce both heat and electricity from a single heat source. Sometimes referred to as *cogeneration*.

Commercial sector: An energy-consuming sector that consists of service-providing facilities and equipment of: businesses; federal, state, and local governments; and other private and public organizations, such as religious, social, or fraternal groups. The commercial sector includes institutional living quarters. It also includes sewage treatment facilities. Common uses of energy associated with this sector include space heating, water heating, air conditioning, lighting, refrigeration, cooking, and running a wide variety of other equipment. *Note:* This sector includes generators that produce electricity and/or useful thermal output primarily to support the activities of the above-mentioned commercial establishments.

Completion (oil/gas production): The term refers to the installation of permanent equipment for the production of oil or gas.

Compressed natural gas (CNG): Natural gas that is comprised primarily of methane, compressed to a pressure at or above 2,400 pounds per square inch and stored in special high-pressure containers. It is used as a fuel for natural gas powered vehicles.

Consumer Price Index (CPI): These prices are collected in 85 urban areas selected to represent all urban consumers about 80 percent of the total U.S. population.

Consumption: A calculated value that is production plus imports minus exports plus or minus stock changes.

Conventional oil and natural gas production: Crude oil and natural gas that is produced by a well drilled into a geologic formation in which the reservoir and fluid characteristics permit the oil and natural gas to readily flow to the wellbore.

Conventional thermal electricity generation: Electricity generated by an electric power plant using coal, petroleum, or gas as its source of energy.

Conventionally fueled vehicle: A vehicle that runs on petroleum-based fuels such as motor gasoline or diesel fuel.

Crude oil: A mixture of hydrocarbons that exists in liquid phase in natural underground reservoirs and remains liquid at atmospheric pressure after passing through surface separating facilities. Depending upon the characteristics of the crude stream, it may also include:

1. Small amounts of hydrocarbons that exist in gaseous phase in natural underground reservoirs but are liquid at atmospheric pressure after being recovered from oil well (casinghead) gas in lease separators and are subsequently commingled with the crude stream without being separately measured. Lease condensate recovered as a liquid from natural gas wells in lease or field separation facilities and later mixed into the crude stream is also included;
2. Small amounts of nonhydrocarbons produced with the oil, such as sulfur and various metals;
3. Drip gases, and liquid hydrocarbons produced from tar sands, oil sands, gilsonite, and oil shale.

Liquids produced at natural gas processing plants are excluded. Crude oil is refined to produce a wide array of petroleum products, including heating oils; gasoline, diesel and jet fuels; lubricants; asphalt; ethane, propane, and butane; and many other products used for their energy or chemical content.

Crude oil production: The volume of crude oil produced from oil reservoirs during given periods of time. The amount of such production for a given period is measured as volumes delivered from lease storage tanks (i.e., the point of custody transfer) to pipelines,

trucks, or other media for transport to refineries or terminals with adjustments for (1) net differences between opening and closing lease inventories, and (2) basic sediment and water.

Crude oil qualities: Refers to properties of crude oil including the sulfur content and API gravity, which affect processing complexity and product characteristics.

Cycling (natural gas): The practice of producing natural gas for the extraction of natural gas liquids, returning the dry residue to the producing reservoir to maintain reservoir pressure and increase the ultimate recovery of natural gas liquids. The reinjected gas is produced for disposition after cycling operations are completed.

D

Deadweight tons: The lifting capacity of a ship expressed in long tons (2,240 lbs.), including cargo, commodities, and crew.

Decatherm: Ten therms or 1,000,000 Btu.

Deliverability: Represents the number of future years during which a pipeline company can meet its annual requirements for its presently certificated delivery capacity from presently committed sources of supply.

Demonstrated reserve base (coal): A collective term for the sum of coal in both measured and indicated resource categories of reliability, representing 100 percent of the in-place coal in those categories as of a certain date.

Depleted storage field: A subsurface natural geological reservoir, usually a depleted gas or oil field, used for storing natural gas.

Development: The preparation of a specific mineral deposit for commercial production; this preparation includes construction of access to the deposit and of facilities to extract the minerals. The development process is sometimes further distinguished between a preproduction stage and a current stage, with the distinction being made on the basis of whether the development work is performed before or after production from the mineral deposit has commenced on a commercial scale.

Development drilling: Drilling done to determine more precisely the size, grade, and configuration of

an ore deposit subsequent to when the determination is made that the deposit can be commercially developed. Not included are: (1) secondary development drilling, (2) solution-mining drilling for production, or (3) production-related underground and openpit drilling done for control of mining operations.

Development well: A well drilled within the proved area of an oil or gas reservoir to the depth of a stratigraphic horizon known to be productive. Also see **Well**.

Diesel-electric plant: A generating station that uses diesel engines to drive its electric generators.

Directional (deviated) well: A well purposely deviated from the vertical, using controlled angles to reach an objective location other than directly below the surface location. A directional well may be the original hole or a directional “sidetrack” hole that deviates from the original bore at some point below the surface. The new footage associated with directional “sidetrack” holes should not be confused with footage resulting from remedial sidetrack drilling. If there is a common bore from which two or more wells are drilled, the first complete bore from the surface to the original objective is classified and reported as a well drilled. Each of the deviations from the common bore is reported as a separate well.

Dispatching: The operating control of an integrated electric system involving operations such as (1) the assignment of load to specific generating stations and other sources of supply to effect the most economical supply as the total or the significant area loads rise or fall; (2) the control of operations and maintenance of high-voltage lines, substations, and equipment; (3) the operation of principal tie lines and switching; (4) the scheduling of energy transactions with connecting electric utilities.

Distillate fuel oil: A general classification for one of the petroleum fractions produced in conventional distillation operations. It includes diesel fuels and fuel oils. Products known as No. 1, No. 2, and No. 4 diesel fuel are used in on-highway diesel engines, such as those in trucks and automobiles, as well as off-highway engines, such as those in railroad locomotives and agricultural machinery. Products known as No. 1, No. 2, and No. 4 fuel oils are used primarily for space heating and electric power generation.

Dry natural gas: Natural gas that remains after: (1) the liquefiable hydrocarbon portion has been removed

from the gas stream (i.e., gas after lease, field, and/or plant separation); and (2) any volumes of nonhydrocarbon gases have been removed where they occur in sufficient quantity to render the gas unmarketable.

Dual fuel vehicle: A motor vehicle that is capable of operating on an alternative fuel and on gasoline or diesel fuel. These vehicles have at least two separate fuel systems which inject each fuel simultaneously into the engine combustion chamber.

Dual-fired unit: A generating unit that can produce electricity using two or more input fuels. In some of these units, only the primary fuel can be used continuously; the alternate fuel(s) can be used only as a start-up fuel or in emergencies.

E

E85: A fuel containing a mixture of approximately 85 percent ethanol and 15 percent gasoline.

Economy of scale: The principle that larger production facilities have lower unit costs than smaller facilities.

Electric hybrid vehicle: An electric vehicle that either (1) operates solely on electricity, but contains an internal combustion motor that generates additional electricity (series hybrid); or (2) contains an electric system and an internal combustion system and is capable of operating on either system (parallel hybrid).

Electric power: The rate at which electric energy is transferred. Electric power is measured by capacity and is commonly expressed in megawatts.

Electric power grid: A system of synchronized power providers and consumers connected by transmission and distribution lines and operated by one or more control centers. In the continental United States, the electric power grid consists of three systems: the Eastern Interconnect, the Western Interconnect, and the Texas Interconnect. In Alaska and Hawaii, several systems encompass areas smaller than the State (e.g., the interconnect serving Anchorage, Fairbanks, and the Kenai Peninsula; individual islands).

Electric power sector: An energy-consuming sector that consists of electricity only and combined heat and power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public—i.e., North American Industry Classification System 22 plants.

Electric system loss: Total energy loss from all causes for an electric utility.

Electric system reliability: The degree to which the performance of the elements of the electrical system results in power being delivered to consumers within accepted standards and in the amount desired. Reliability encompasses two concepts, adequacy and security. Adequacy implies that there are sufficient generation and transmission resources installed and available to meet projected electrical demand plus reserves for contingencies. Security implies that the system will remain intact operationally (i.e., will have sufficient available operating capacity) even after outages or other equipment failure. The degree of reliability may be measured by the frequency, duration, and magnitude of adverse effects on consumer service.

Electric utility sector: The electric utility sector consists of privately and publicly owned establishments that generate, transmit, distribute, or sell electricity primarily for use by the public and that meet the definition of an electric utility. Nonutility power producers are not included in the electric sector.

Electricity generation: The process of producing electric energy or the amount of electric energy produced by transforming other forms of energy, commonly expressed in kilowatt-hours or megawatt-hours.

Endowment (or Resource Endowment): fossil energy sources from the earth's physical store of non-renewable hydrocarbons: tons of coal, cubic feet of natural gas, barrels of oil, etc. The total endowment of fossil hydrocarbons is fixed.

Energy: The capacity for doing work as measured by the capability of doing work (potential energy) or the conversion of this capability to motion (kinetic energy). Energy has several forms, some of which are easily convertible and can be changed to another form useful for work. Most of the world's convertible energy comes from fossil fuels that are burned to produce heat that is then used as a transfer medium to mechanical or other means in order to accomplish tasks. Electrical energy is usually measured in kilowatt-hours, while heat energy is frequently measured in British thermal units (Btu).

Energy consumption: The use of energy as a source of heat or power or as a raw material input to a manufacturing process.

Energy demand: The requirement for energy as an input to provide products and/or services.

Energy efficiency: The ratio of useful work performed to the total energy expended. Also, the products and practices employed to reduce the energy expenditure to produce a given amount of work.

Energy Information Administration (EIA): An independent agency within the U.S. Department of Energy that develops surveys, collects energy data, and does analytical and modeling analyses of energy issues. The agency must satisfy the requests of Congress, other elements within the Department of Energy, Federal Energy Regulatory Commission, the Executive Branch, its own independent needs, and assist the general public, or other interest groups, without taking a policy position.

Environmental restrictions: In reference to fossil fuel accessibility, land-use restrictions that constrain, postpone, or prohibit development in order to protect environmental resources of an area; for example, surface- or groundwater quality, air quality affected by mining, or plants or animals or their habitats.

Ethanol: A clear, colorless, flammable alcohol. Ethanol is typically produced chemically from ethylene, or biologically from fermentation of various sugars from carbohydrates found in agricultural crops and cellulosic residues from crops or wood. It is used in the United States as a gasoline octane enhancer and oxygenate (blended up to 10 percent concentration). Ethanol can also be used in high concentrations (E85) in vehicles designed for its use

Exploration drilling: Drilling done in search of new mineral deposits, on extensions of known ore deposits, or at the location of a discovery up to the time when the company decides that sufficient ore reserves are present to justify commercial exploration. Assessment drilling is reported as exploration drilling.

Exploratory well: A hole drilled: (1) to find and produce oil or gas in an area previously considered unproductive area; (2) to find a new reservoir in a known field, i.e., one previously producing oil and gas from another reservoir; or (3) to extend the limit of a known oil or gas reservoir.

Extensions: Any new reserves credited to a previously producing reservoir because of enlargement of its proved area. This enlargement in proved area is usually

due to new well drilling outside of the previously known productive limits of the reservoir.

Extensions, discoveries, and other additions: Additions to an enterprise's proved reserves that result from (1) extension of the proved acreage of previously discovered (old) reserves through additional drilling in periods subsequent to discovery and (2) discovery of new fields with proved reserves or of new reservoirs of proved reserves in old fields.

Externalities: Benefits or costs, generated as a byproduct of an economic activity, that do not accrue to the parties involved in the activity. Environmental externalities are benefits or costs that manifest themselves through changes in the physical or biological environment.

F

Field: An area consisting of a single reservoir or multiple reservoirs all grouped on, or related to, the same individual geological structural feature and/or stratigraphic condition. There may be two or more reservoirs in a field that are separated vertically by intervening impervious strata or laterally by local geologic barriers, or by both.

Fleet vehicle: Any motor vehicle a company owns or leases that is in the normal operations of a company. Vehicles that are used in the normal operation of a company, but are owned by company employees are not fleet vehicles. If a company provides services in addition to providing natural gas, only those vehicles that are used by the natural gas provider portion of a company should be counted as fleet vehicles. Vehicles that are considered "off-road" (e.g., farm or construction vehicles) or demonstration vehicles are not counted as fleet vehicles.

Flexible fuel vehicle: A vehicle that can operate on: (1) alternative fuels (such as M85 or E85); (2) 100-percent petroleum-based fuels; and (3) any mixture of an alternative fuel (or fuels) and a petroleum-based fuel. Flexible fuel vehicles have a single fuel system to handle alternative and petroleum-based fuels. Flexible fuel vehicle and variable fuel vehicle are synonymous terms.

Flue: An enclosed passageway for directing products of combustion to the atmosphere.

Flue-gas desulfurization unit (scrubber): Equipment used to remove sulfur oxides from the combustion

gases of a boiler plant before discharge to the atmosphere. Chemicals such as lime are used as the scrubbing media.

Flue-gas particulate collector: Equipment used to remove fly ash from the combustion gases of a boiler plant before discharge to the atmosphere. Particulate collectors include electrostatic precipitators, mechanical collectors (cyclones), fabric filters (bag-houses), and wet scrubbers.

Fluidized-bed combustion: A method of burning particulate fuel, such as coal, in which the fuel particles are continually fed into a bed of mineral ash in the proportions of 1 part fuel to 200 parts ash, while a flow of air passes up through the bed, causing it to act like a turbulent fluid.

Fossil fuel: An energy source formed in the earth's crust from decayed organic material. The common fossil fuels are petroleum, coal, and natural gas.

Fuel: Any material substance that can be consumed to supply heat or power. Included are petroleum, coal, and natural gas (the fossil fuels), and other consumable materials, such as uranium, biomass, and hydrogen.

Fuel cell: A device capable of generating an electrical current by converting the chemical energy of a fuel (e.g., hydrogen) directly into electrical energy. Fuel cells differ from conventional electrical cells in that the active materials such as fuel and oxygen are not contained within the cell but are supplied from outside. It does not contain an intermediate heat cycle, as do most other electrical generation techniques.

G

Gas: A non-solid, non-liquid combustible energy source that includes natural gas, coke-oven gas, blast-furnace gas, and refinery gas.

Gas oil: European and Asian designation for No. 2 heating oil and No. 2 diesel fuel.

Gas processing unit: A facility designed to recover natural gas liquids from a stream of natural gas that may or may not have passed through lease separators and/or field separation facilities. Another function of natural gas processing plants is to control the quality of the processed natural gas stream. Cycling plants are considered natural gas processing plants.

Gas to liquids (GTL): A process that combines the carbon and hydrogen elements in natural gas molecules to make synthetic liquid petroleum products, such as diesel fuel.

Gas turbine plant: A plant in which the prime mover is a gas turbine. A gas turbine consists typically of an axial-flow air compressor and one or more combustion chambers where liquid or gaseous fuel is burned and the hot gases are passed to the turbine and where the hot gases expand drive the generator and are then used to run the compressor.

Gas well: A well completed for production of natural gas from one or more gas zones or reservoirs. Such wells contain no completions for the production of crude oil.

Gasification: A method for converting coal, petroleum, biomass, wastes, or other carbon-containing materials into a gas that can be burned to generate power or processed into chemicals and fuels.

Gasohol: A blend of finished motor gasoline containing alcohol (generally ethanol but sometimes methanol) at a concentration between 5.7 percent and 10 percent by volume.

GDP: See **Gross domestic product**.

Generation: The process of producing electric energy by transforming other forms of energy; also, the amount of electric energy produced, expressed in kilowatt-hours.

Generator capacity: The maximum output, commonly expressed in megawatts, that generating equipment can supply to system load, adjusted for ambient conditions.

Generator nameplate capacity: The maximum rated output of a generator under specific conditions designated by the manufacturer. Generator nameplate capacity is usually indicated in units of kilovolt-amperes and in kilowatts on a nameplate physically attached to the generator.

Geologic assurance: State of sureness, confidence, or certainty of the existence of a quantity of resources based on the distance from points where coal is measured or sampled and on the abundance and quality of geologic data as related to thickness of overburden,

rank, quality, thickness of coal, areal extent, geologic history, structure, and correlations of coalbeds and enclosing rocks. The degree of assurance increases as the nearness to points of control, abundance, and quality of geologic data increases.

Geologic considerations: Conditions in the coal deposit or in the rocks in which it occurs that may complicate or preclude mining. Geologic considerations are evaluated in the context of the current state of technology and regulations, so the impact on mining may change with time.

Geological and geophysical costs: Costs incurred in making geological and geophysical studies, including, but not limited to, costs incurred for salaries, equipment, obtaining rights of access, and supplies for scouts, geologists, and geophysical crews.

Geological repository: A mined facility for disposal of radioactive waste that uses waste packages and the natural geology as barriers to provide waste isolation.

Geopressured: A type of geothermal resource occurring in deep basins in which the fluid is under very high pressure.

Geothermal energy: Hot water or steam extracted from geothermal reservoirs in the earth's crust. Water or steam extracted from geothermal reservoirs can be used for geothermal heat pumps, water heating, or electricity generation.

Gigawatt: One billion watts or one thousand megawatts.

Gigawatt-hour: One billion watt-hours.

GNP: See **Gross national product**.

Grid: The layout of an electrical distribution system.

Gross domestic product (GDP): The total value of goods and services produced by labor and property within a referenced area.

Gross national product (GNP): The total value of goods and services produced by the nation's economy before deduction of depreciation charges and other allowances for capital consumption. It includes the total purchases of goods and services by private consumers and government, gross private domestic capital investment, and net foreign trade.

H

Heat content: The amount of heat energy available to be released by the transformation or use of a specified physical unit of an energy form (e.g., a ton of coal, a barrel of oil, a kilowatt-hour of electricity, a cubic foot of natural gas, or a pound of steam). The amount of heat energy is commonly expressed in British thermal units (Btu). *Note:* Heat content of combustible energy forms can be expressed in terms of either gross heat content (higher or upper heating value) or net heat content (lower heating value), depending upon whether or not the available heat energy includes or excludes the energy used to vaporize the water contained in the original energy form or created during the combustion process.

Heat pump: Heating and/or cooling equipment that, during the heating season, draws heat into a building from outside and, during the cooling season, ejects heat from the building to the outside. Heat pumps are vapor-compression refrigeration systems whose indoor/outdoor coils are used reversibly as condensers or evaporators, depending on the need for heating or cooling.

Heat rate: A measure of generating station **thermal efficiency** commonly stated as Btu per kilowatt-hour. *Note:* Heat rates can be expressed as either gross or net heat rates, depending whether the electricity output is gross or net generation. Heat rates are typically expressed as net heat rates.

Heavy oil: Heavy oil, extra-heavy oil, and bitumen are unconventional oil resources that are characterized by high viscosities (i.e., resistance to flow) and high densities compared to conventional oil.

Horsepower: A unit for measuring the rate of work (or power) equivalent to 33,000 foot-pounds per minute or 746 watts.

Host government: The government (including any government-controlled firm) of the foreign country in which the production, refining, or marketing of crude oil or petroleum products occurs.

Household: A family, an individual, or a group of up to nine unrelated persons occupying the same housing unit. "Occupy" means that the housing unit is the person's usual or permanent place of residence.

Housing unit: A house, an apartment, a group of rooms, or a single room if it is either occupied or intended for occupancy as separate living quarters by a family, an

individual, or a group of one to nine unrelated persons. Separate living quarters means the occupants (1) live and eat separately from other persons in the house or apartment and (2) have direct access from the outside of the buildings or through a common hall—that is, they can get to it without going through someone else's living quarters. Housing units do not include group quarters such as prisons or nursing homes where ten or more unrelated persons live. A common dining area used by residents is an indication of group quarters. Hotel and motel rooms are considered housing units if occupied as the usual or permanent place of residence.

Hydraulic fracturing: Fracturing of rock at depth with fluid pressure. Hydraulic fracturing at depth may be accomplished by pumping water into a well at very high pressures. Under natural conditions, vapor pressure may rise high enough to cause fracturing in a process known as hydrothermal brecciation.

Hydrocarbon: An organic chemical compound of hydrogen and carbon in the gaseous, liquid, or solid phase. The molecular structure of hydrocarbon compounds varies from the simplest (methane, a constituent of natural gas) to the very heavy and very complex.

Hydroelectric power: The use of flowing water to produce electrical energy.

Hydrogen: The lightest of all gases, occurring chiefly in combination with oxygen in water; exists also in acids, bases, alcohols, petroleum, and other hydrocarbons.

I

IEA: See **International Energy Agency**.

Implicit price deflator: The implicit price deflator, published by the U.S. Department of Commerce, Bureau of Economic Analysis, is used to convert nominal monetary figures (actual money at any given time) to real figures (money expressed in terms of equivalent values in a different year).

Imports: Receipts of goods into a country. For the United States, into the 50 states and the District of Columbia from U.S. possessions and territories or from foreign countries.

Improved recovery: Extraction of crude oil or natural gas by any method other than those that rely primarily on natural reservoir pressure, gas lift, or a system of pumps.

Incandescent lamp: A glass enclosure in which light is produced when a tungsten filament is electrically heated so that it glows. Much of the energy is converted into heat; therefore, this class of lamp is a relatively inefficient source of light. Included in this category are the familiar screw-in light bulbs, as well as somewhat more efficient lamps, such as tungsten halogen lamps, reflector or r-lamps, parabolic aluminized reflector (PAR) lamps, and ellipsoidal reflector (ER) lamps.

Industrial production: The Federal Reserve Board calculates this index by compiling indices of physical output from a variety of agencies and trade groups, weighting each index by the Census' value added, and adding it to the cost of materials. When physical measures are not available, the Federal Reserve Board uses the number of production workers or amount of electricity consumed as the basis for the index. To convert industrial production into dollars, multiply by the "real value added" estimate used by the Federal Reserve Board.

Industrial sector: An energy-consuming sector that consists of all facilities and equipment used for producing, processing, or assembling goods. The industrial sector encompasses the following types of activity: manufacturing (NAICS codes 31-33); agriculture, forestry, fishing and hunting (NAICS code 11); mining, including oil and gas extraction (NAICS code 21); and construction (NAICS code 23). Overall energy use in this sector is largely for process heat and cooling and powering machinery, with lesser amounts used for facility heating, air conditioning, and lighting. Fossil fuels are also used as raw material inputs to manufactured products. *Note:* This sector includes generators that produce electricity and/or useful thermal output primarily to support the above-mentioned industrial activities.

Infrastructure: A collective term for the parts forming the foundation of a system, which are necessary for its operation; e.g., refineries, pipelines, storage tanks, etc.

In situ leach mining: The recovery, by chemical leaching, of the valuable components of a mineral deposit without physical extraction of the mineralized rock from the ground. Also referred to as "solution mining."

Intensity: The measure of the degree or amount of some quality or condition. Energy intensity is the ratio of energy use to GDP, population, floor space, etc.

Intergovernmental Panel on Climate Change (IPCC): A panel established jointly in 1988 by the World Meteorological Organization and the United Nations Environment Program to assess the scientific information relating to climate change and to formulate realistic response strategies.

International Energy Agency (IEA): An autonomous agency linked with the OECD that acts as energy policy advisor to its 26 member countries in their effort to ensure reliable, affordable and clean energy for their citizens. Its work focuses on climate change policies, market reform, energy technology collaboration, and outreach to the rest of the world, especially major producers and consumers of energy.

International oil company (IOC): An oil company that has operations in more than one country. Twelve of these companies, that were believed to make global supply/demand projections, were invited to participate in the *National Petroleum Council Survey of Global Energy Supply/Demand Outlooks* and are listed in Chapter 7, “Methodology,” of the NPC report.

J

Joule: The meter-kilogram-second unit of work or energy, equal to the work done by a force of one newton when its point of application moves through a distance of one meter in the direction of the force; equivalent to 107 ergs and one watt-second.

Joule’s Law: The rate of heat production by a steady current in any part of an electrical circuit that is proportional to the resistance and to the square of the current, or, the internal energy of an ideal gas depends only on its temperature.

K

Kerogen: Organic matter that has not gone through the “oil window” of elevated temperature and pressure necessary to generate conventional light crude oil. Kerogen has a high hydrogen/carbon ratio.

Kilowatt: One thousand watts.

Kilowatt-hour: A measure of electricity defined as a unit of work or energy, measured as 1 kilowatt (1,000 watts) of power expended for 1 hour. One kilowatt-hour is equivalent to 3,412 Btu.

Kyoto Protocol: The result of negotiations at the third Conference of the Parties (COP-3) in Kyoto, Japan, in December of 1997. The Kyoto Protocol sets binding greenhouse gas emissions targets for countries that sign and ratify the agreement. The gases covered under the Protocol include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride.

L

Lead acid battery: An electrochemical battery that uses lead and lead oxide for electrodes and sulfuric acid for the electrolyte.

Lease and plant fuel: Natural gas used in well, field, and lease operations (such as gas used in drilling operations, heaters, dehydrators, and field compressors) and as fuel in natural gas processing plants.

Lease condensate: A mixture consisting primarily of pentanes and heavier hydrocarbons, which is recovered as a liquid from natural gas in lease separation facilities. This category excludes natural gas plant liquids, such as butane and propane, which are recovered at downstream natural gas processing plants or facilities.

Light trucks: The Department of Transportation defines light trucks as all single unit two-axle, four-tire trucks, including pickup trucks, sports utility vehicles, vans, motor homes, etc. The Energy Information Administration defines light truck as all trucks weighing 8,500 pounds or less.

Lignite: The lowest rank of coal, often referred to as brown coal, used almost exclusively as fuel for steam-electric power generation. It is brownish-black and has a high inherent moisture content, sometimes as high as 45 percent. The heat content of lignite ranges from 9 to 17 million Btu per ton on a moist, mineral-matter-free basis. The heat content of lignite consumed in the United States averages 13 million Btu per ton, on the as-received basis (i.e., containing both inherent moisture and mineral matter).

Line loss: Electric energy lost because of the transmission of electricity. Much of the loss is thermal in nature.

Line-miles of seismic exploration: The distance along the Earth’s surface that is covered by seismic surveying.

Liquefied natural gas (LNG): Natural gas (primarily **methane**) that has been liquefied by reducing its temperature to -260 degrees Fahrenheit at atmospheric pressure.

Load (electric): The amount of electric power delivered or required at any specific point or points on a system. The requirement originates at the energy-consuming equipment of the consumers.

Long ton: A unit that equals 20 long hundredweight or 2,240 pounds. Used mainly in England.

M

Manufactured gas: A gas obtained by destructive distillation of coal or 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 oven gases, producer gas, blast furnace gas, blue (water) gas, carbureted water gas. Btu content varies widely.

Manufacturing: An energy-consuming subsector of the industrial sector that consists of all facilities and equipment engaged in the mechanical, physical, chemical, or electronic transformation of materials, substances, or components into new products. Assembly of component parts of products is included, except for that which is included in construction.

Marginal Well: An oil well that produces ten barrels per day or less. In aggregate, these wells provide approximately one sixth of U.S. production.

Megawatt: One million watts of electricity.

Megawatt-hour: One thousand kilowatt-hours or one million watt-hours.

Metallurgical coal: Coking coal and pulverized coal consumed in making steel.

Methane: A colorless, flammable, odorless hydrocarbon gas, which is the major component of natural gas. It is also an important source of hydrogen in various industrial processes. Methane is a greenhouse gas.

Methanol: A light, volatile alcohol, used in the transesterification of vegetable oils to produce biodiesel.

Metocean: Weather of the offshore environment both above and below the surface of the water. The word is a contraction of “meteorology” (weather in the air

and “oceanology” (conditions below the surface of the water) and is used by all offshore industries.

Metric ton: A unit of weight equal to 2,204.6 pounds.

Minable: Capable of being mined under current mining technology and environmental and legal restrictions, rules, and regulations.

Multiple completion well: A well equipped to produce oil and/or gas separately from more than one reservoir. Such wells contain multiple strings of tubing or other equipment that permit production from the various completions to be measured and accounted for separately. For statistical purposes, a multiple completion well is reported as one well and classified as either an oil well or a gas well. If one of the several completions in a given well is an oil completion, the well is classified as an oil well. If all of the completions in a given well are gas completions, the well is classified as a gas well.

N

NAICS: See **North American Industry Classification System**.

National oil company: An oil company that is owned by a sovereign nation.

Natural gas: A gaseous mixture of hydrocarbon compounds, the primary one being **methane**.

Natural gas hydrates: Solid, crystalline, wax-like substances composed of water, methane, and usually a small amount of other gases, with the gases being trapped in the interstices of a water-ice lattice. They form beneath permafrost and on the ocean floor under conditions of moderately high pressure and at temperatures near the freezing point of water.

Natural gas liquids (NGL): Those hydrocarbons in natural gas that are separated from the gas as liquids through the process of absorption, condensation, adsorption, or other methods in gas processing or cycling plants. Generally such liquids consist of propane and heavier hydrocarbons and are commonly referred to as lease condensate, natural gasoline, and liquefied petroleum gases. Natural gas liquids include natural gas plant liquids (primarily ethane, propane, butane, and isobutene).

Natural Gas Policy Act of 1978 (NGPA): Signed into law on November 9, 1978, the NGPA is a framework

for the regulation of most facets of the natural gas industry.

Natural gas processing plant: Facilities designed to recover natural gas liquids from a stream of natural gas that may or may not have passed through lease separators and/or field separation facilities. These facilities control the quality of the natural gas to be marketed. Cycling plants are classified as gas processing plants.

Natural reservoir pressure: The energy within an oil or gas reservoir that causes the oil or gas to rise (unassisted by other forces) to the earth's surface when the reservoir is penetrated by an oil or gas well. The energy may be the result of "dissolved gas drive," "gas cap drive," or "water drive." Regardless of the type of drive, the principle is the same: the energy of the gas or water, creating a natural pressure, forces the oil or gas to the wellbore.

NERC: See **North American Electric Reliability Council**.

New field discoveries: The volumes of proved reserves of crude oil, natural gas, and/or natural gas liquids discovered in new fields during the report year.

New reservoir: A reservoir discovered during the report year.

Nominal dollars: The actual dollar value at any given point in time, as opposed to "real dollars" which are adjusted for inflation to a common year's dollar value.

Nominal price: The price paid for a product or service at the time of the transaction. Nominal prices are those that have not been adjusted to remove the effect of changes in the purchasing power of the dollar; they reflect buying power in the year in which the transaction occurred.

Nonassociated natural gas: Natural gas that is not in contact with significant quantities of crude oil in the reservoir.

Nonattainment area: Any area that does not meet the national primary or secondary ambient air quality standard established by the Environmental Protection Agency for designated pollutants, such as carbon monoxide and ozone.

Nonfungible product: A fuel blend or blendstock that cannot be commingled with other similar stocks due to specific qualities or quality restrictions.

North American Electric Reliability Council (NERC): A council formed in 1968 by the electric utility industry to promote the reliability and adequacy of bulk power supply in the electric utility systems of North America. NERC consists of regional reliability councils and encompasses essentially all the power regions of the contiguous United States, Canada, and Mexico.

North American Industry Classification System (NAICS): A classification scheme, developed by the Office of Management and Budget to replace the Standard Industrial Classification (SIC) System, that categorizes establishments according to the types of production processes they primarily use.

Nuclear electric power (nuclear power): Electricity generated by the use of the thermal energy released from the fission of nuclear fuel in a reactor.

Nuclear reactor: An apparatus in which a nuclear fission chain reaction can be initiated, controlled, and sustained at a specific rate. A reactor includes fuel (fissionable material), moderating material to control the rate of fission, a heavy-walled pressure vessel to house reactor components, shielding to protect personnel, a system to conduct heat away from the reactor, and instrumentation for monitoring and controlling the reactor's systems.

O

Off-highway use: Includes petroleum products sales for use in equipment that is generally not licensed for highway use:

1. *Construction.* Construction equipment including earthmoving equipment, cranes, stationary generators, air compressors, etc.
2. *Other.* Sales for off-highway uses other than construction. Sales for logging are included in this category. Volumes for off-highway use by the agriculture industry are reported under "Farm Use" (which includes sales for use in tractors, irrigation pumps, other agricultural machinery, etc.)

Offshore: That geographic area that lies seaward of the coastline. In general, the coastline is the line of ordinary low water along with that portion of the coast that is in direct contact with the open sea or the line marking the seaward limit of inland water. Some states use a different basis—e.g., Cook Inlet in Alaska is classified as offshore, and for Louisiana, the coastline is defined

as the Chapman Line, as modified by subsequent adjudication.

Offshore reserves and production: Unless otherwise dedicated, reserves and production that are in either state or federal domains, located seaward of the coastline.

Oil: A mixture of hydrocarbons usually existing in the liquid state in natural underground pools or reservoirs. Gas is often found in association with oil.

Oil reservoir: An underground pool of liquid consisting of hydrocarbons, sulfur, oxygen, and nitrogen trapped within a geological formation and protected from evaporation by the overlying mineral strata.

Oil sands: See **Tar sands**.

Oil shale: A sedimentary rock containing **kerogen**, a solid organic material.

On-highway use (diesel): Includes sales for use in licensed motor vehicles. Volumes used by companies in the marketing and distribution of petroleum products are also included.

OPEC (Organization of the Petroleum Exporting Countries): An organization founded in Baghdad, Iraq, in September 1960, to unify and coordinate members' petroleum policies. OPEC members' national oil ministers meet regularly to discuss prices and, since 1982, to set crude oil production quotas. Original OPEC members include Iran, Iraq, Kuwait, Saudi Arabia, and Venezuela. Between 1960 and 1975, the organization expanded to include Qatar (1961), Indonesia (1962), Libya (1962), the United Arab Emirates (1967), Algeria (1969), Nigeria (1971), Ecuador (1973), and Gabon (1975). Ecuador withdrew in December 1992, and Gabon withdrew in January 1995. Although Iraq remains a member of OPEC, Iraqi production has not been a part of any OPEC quota agreements since March 1998. Angola joined OPEC in 2006.

Organisation for Economic Co-operation and Development (OECD): An international organization helping governments tackle the economic, social and governance challenges of a globalized economy. Its membership comprises about 30 member countries. With active relationships with some 70 other countries, NGOs, and civil society, it has a global reach.

Outage: The period during which a generating unit, transmission line, or other facility is out of service.

Outer Continental Shelf (OCS): Offshore federal domain.

P

Particulate: A small, discrete mass of solid or liquid matter that remains individually dispersed in gas or liquid emissions. Particulates take the form of aerosol, dust, fume, mist, smoke, or spray. Each of these forms has different properties.

Passenger-miles traveled: The total distance traveled by all passengers. It is calculated as the product of the occupancy rate in vehicles and the vehicle miles traveled.

Passive solar heating: A solar heating system that uses no external mechanical power, such as pumps or blowers, to move the collected solar heat.

Permeability: The ease with which fluid flows through a porous medium.

Persian Gulf: The countries that surround the Persian Gulf are: Bahrain, Iran, Iraq, Kuwait, Qatar, Saudi Arabia, and the United Arab Emirates.

Petrochemicals: Organic and inorganic compounds and mixtures that include but are not limited to organic chemicals, cyclic intermediates, plastics and resins, synthetic fibers, elastomers, organic dyes, organic pigments, detergents, surface active agents, carbon black, and ammonia.

Petroleum: A broadly defined class of liquid hydrocarbon mixtures. Included are crude oil, lease condensate, unfinished oils, refined products obtained from the processing of crude oil, and natural gas plant liquids.

Petroleum products: Petroleum products are obtained from the processing of crude oil (including lease condensate), natural gas, and other hydrocarbon compounds. Petroleum products include unfinished oils, liquefied petroleum gases, pentanes plus, aviation gasoline, motor gasoline, naphtha-type jet fuel, kerosene-type jet fuel, kerosene, distillate fuel oil, residual fuel oil, petrochemical feedstocks, special naphthas, lubricants, waxes, petroleum coke, asphalt, road oil, still gas, and miscellaneous products.

Pore space: The open spaces or voids of a rock taken collectively. It is a measure of the amount of liquid or gas that may be absorbed or yielded by a particular formation.

Porosity: The ratio of the volume of **pore space** to the total volume of rock.

Power: The rate of producing, transferring, or using energy, most commonly associated with electricity. Power is measured in watts and often expressed in kilowatts or megawatts. Also known as “real” or “active” power.

Primary energy: All energy consumed by end users, excluding electricity but including the energy consumed at electric utilities to generate electricity.

Primary recovery: The crude oil or natural gas recovered by any method that may be employed to produce them where the fluid enters the wellbore by the action of natural reservoir pressure (energy or gravity).

Probable reserves: Estimated quantities of energy sources that, on the basis of geologic evidence that supports projections from **proved reserves**, can reasonably be expected to exist and be recoverable under existing economic and operating conditions. Knowledge of probable reserves is less certain than it is for proved reserves.

Production, oil and gas: The lifting of oil and gas to the surface and gathering, treating, field processing (as in the case of processing gas to extract liquid hydrocarbons), and field storage. The production function is normally regarded as terminating at the outlet valve on the lease or field production storage tank.

Propane: A normally gaseous straight-chain hydrocarbon. It is a colorless paraffinic gas that boils at a temperature of -43.67 degrees Fahrenheit. It is extracted from natural gas or refinery gas streams. It includes all products designated in ASTM Specification D1835 and Gas Processors Association Specifications for commercial propane and HD-5 propane.

Proved reserves: Estimated quantities of energy sources that analysis of geologic and engineering data demonstrates with reasonable certainty are recoverable under existing economic and operating conditions. The location, quantity, and grade of the energy source are usually considered to be well established in such reserves.

Proved reserves, coal: Reserves or resources for which tonnage is computed from dimensions revealed in outcrops, trenches, workings, and drill holes and for which the grade is computed from the results of

detailed sampling. The sites for inspection, sampling, and measurement are spaced so closely and the geologic character is so well defined that size, shape, and mineral content are well established.

Public Utility Regulatory Policies Act (PURPA) of 1978: One part of the National Energy Act, PURPA contains measures designed to encourage the conservation of energy, more efficient use of resources, and equitable rates. Principal among these were suggested retail rate reforms and new incentives for production of electricity by cogenerators and users of renewable resources. The Commission has primary authority for implementing several key PURPA programs.

Purchasing Power Parity (PPP): The exchange rate that equates the price of a basket of identical traded goods and services among countries. Purchasing power parity says that goods and services should cost the same in all countries when measured on a common basis. PPP is often different from current market exchange rates.

Pyrolysis: The thermal decomposition of biomass at high temperatures (greater than 400° F, or 200° C) in the absence of air. The end product of pyrolysis is a mixture of solids (char), liquids (oxygenated oils), and gases (methane, carbon monoxide, and carbon dioxide) with proportions determined by operating temperature, pressure, oxygen content, and other conditions.

Q

Quad: One quadrillion British thermal units (Btu).

Quadrillion: The quantity 1,000,000,000,000,000 (10 to the 15th power).

Quality or grade (of coal): An informal classification of coal relating to its suitability for use for a particular purpose. Refers to individual measurements such as heat value, fixed carbon, moisture, ash, sulfur, major, minor, and trace elements, coking properties, petrologic properties, and particular organic constituents. The individual quality elements may be aggregated in various ways to classify coal for such special purposes as metallurgical, gas, petrochemical, and blending usages.

R

R-value: A measure of a material's resistance to heat flow in units of Fahrenheit degrees x hours x square feet per Btu. The higher the R-value of a material, the

greater its insulating capability. The R-value of some insulating materials is 3.7 per inch for fiberglass and cellulose, 2.5 per inch for vermiculite, and more than 4 per inch for foam. All building materials have some R-value. For example, a 4-inch brick has an R-value of 0.8, and half-inch plywood has an R-value of 0.6.

Radiant energy: Energy that transmits away from its source in all directions.

Rank (of coal): See **Quality or grade (of coal)**.

Real dollars: These are dollars that have been adjusted for inflation to a particular year's buying power.

Real price: A price that has been adjusted to remove the effect of changes in the purchasing power of the dollar. Real prices, which are expressed in constant dollars, usually reflect buying power relative to a base year.

Reclamation: Process of restoring surface environment to acceptable pre-existing conditions. Includes surface contouring, equipment removal, well plugging, revegetation, etc.

Recovery Factor: The percent of resources that are recovered from a reservoir. The recovery factor may change over time due to technical advances in recovery methods.

Reinjected: The forcing of gas under pressure into an oil reservoir in an attempt to increase recovery.

Reliability (electric system): A measure of the ability of the system to continue operation while some lines or generators are out of service. Reliability deals with the performance of the system under stress.

Renewable energy resources: Energy resources that are naturally replenishing but flow-limited. They are virtually inexhaustible in duration but limited in the amount of energy that is available per unit of time. Renewable energy resources include: biomass, hydro, geothermal, solar, wind, ocean thermal, wave action, and tidal action.

Repressuring: The injection of gas into oil or gas formations to effect greater ultimate recovery.

Research, development, and demonstration (RD&D): Basic and applied research in the sciences and engineering and the design and development of prototypes and processes taken to full scale development in full scale, commercial facilities.

Reserve generating capacity: Amount of generating capacity available to meet peak or abnormally high demands for power and to generate power during scheduled or unscheduled outages.

Reserve margin (operating): The amount of unused available capability of an electric power system (at peak load for a utility system) as a percentage of total capability.

Reserve revisions: Changes to prior year-end proved reserves estimates, either positive or negative, resulting from new information other than an increase in proved acreage (extension). Revisions include increases of proved reserves associated with the installation of improved recovery techniques or equipment.

Reserves: Those estimated quantities of the endowment anticipated to be commercially recoverable from known accumulations from a given date forward. Reserves must satisfy four criteria: they must be *discovered, recoverable, commercial, and remaining* based on the development technologies currently in place.

Reservoir: A porous and permeable underground formation containing an individual and separate natural accumulation of producible hydrocarbons (crude oil and/or natural gas) which is confined by impermeable rock or water barriers and is characterized by a single natural pressure system.

Reservoir capacity: The present total developed capacity (base and working) of the storage reservoir, excluding contemplated future development.

Residential building: A structure used primarily as a dwelling for one or more households.

Residential/commercial (consumer category): Housing units, wholesale or retail businesses (except coal wholesale dealers); health institutions (hospitals, social and educational institutions (schools and universities); and federal, state, and local governments (military installations, prisons, office buildings, etc.). Excludes shipments to Federal power projects, such as TVA, and rural electrification cooperatives, power districts, and state power projects.

Residential sector: An energy-consuming sector that consists of living quarters for private households. Common uses of energy associated with this sector

include space heating, water heating, air conditioning, lighting, refrigeration, cooking, and running a variety of other appliances. The residential sector excludes institutional living quarters.

Resources: Those quantities of the endowment estimated, as of a given date, to be potentially recoverable from known and undiscovered accumulations. Resources are not considered commercial at the time of estimation.

Revisions and additions (gross change in reserves): The difference (plus or minus) between the year-end reserves plus production for a given year and the year-end reserves for the previous year.

Rotary rig: A machine used for drilling wells that employs a rotating tube attached to a bit for boring holes through rock.

S

Seasonal energy efficiency ratio (SEER): Ratio of the cooling output divided by the power consumption. It is the Btu of cooling output during its normal annual usage divided by the total electric energy input in watt-hours during the same period. This is a measure of the cooling performance for rating central air conditioners and central heat pumps. The appliance standards required a minimum SEER of 10 for split-system central air conditioners and for split-system central heat pumps in 1992. (The average heat pump or central air conditioner sold in 1986 had an SEER of about 9.)

Short ton: A unit of weight equal to 2,000 pounds.

Solar energy: The radiant energy of the sun, which can be converted into other forms of energy, such as heat or electricity.

Steam coal: All nonmetallurgical coal.

Steam electric power plant (conventional): A plant in which the prime mover is a steam turbine. The steam used to drive the turbine is produced in a boiler where fossil fuels are burned.

Steam turbine: A device that converts high-pressure steam into mechanical energy that can then be used to produce electricity by forcing blades in a cylinder to rotate and turn a generator shaft.

Stratigraphic test well: A geologically directed drilling effort to obtain information pertaining to a specific

geological condition that might lead toward the discovery of an accumulation of hydrocarbons. Such wells are customarily drilled without the intention of being completed for hydrocarbon production. This classification also includes tests identified as core tests and all types of expendable holes related to hydrocarbon exploration.

Stripper well: An oil or gas well that produces at relatively low rates. For oil, stripper production is usually defined as production rates of less than 15 barrels of oil per day. Stripper gas production would generally be anything less than 60 thousand cubic feet per day.

Subbituminous coal: A coal whose properties range from those of lignite to those of bituminous coal and used primarily as fuel for steam-electric power generation. It may be dull, dark brown to black, soft and crumbly, at the lower end of the range, to bright, jet black, hard, and relatively strong, at the upper end. Subbituminous coal contains 20 to 30 percent inherent moisture by weight. The heat content of subbituminous coal ranges from 17 to 24 million Btu per ton on a moist, mineral-matter-free basis. The heat content of subbituminous coal consumed in the United States averages 17 to 18 million Btu per ton, on the as-received basis (i.e., containing both inherent moisture and mineral matter).

Supply source: May be a single completion, a single well, a single field with one or more reservoirs, several fields under a single gas-purchase contract, miscellaneous fields, a processing plant, or a field area; provided, however, that the geographic area encompassed by a single supply source may not be larger than the state in which the reserves are reported.

T

Tar sands: Naturally occurring bitumen-impregnated sands that yield mixtures of liquid hydrocarbon and that require further processing other than mechanical blending before becoming finished petroleum products.

Terawatt-hour: One trillion (1,000,000,000,000) watt-hours.

Therm: One hundred thousand (100,000) Btu.

Thermal: A term used to identify a type of electric generating station, capacity, capability, or output in which the source of energy for the prime mover is heat.

Thermal efficiency: A measure of the efficiency of converting a fuel to energy and useful work; useful work and energy output divided by higher heating value of input fuel times 100 (for percent).

Tight gas: An unconventional source of natural gas production from tight, low permeability sandstones.

Transmission and distribution loss: Electric energy lost due to the transmission and distribution of electricity. Much of the loss is thermal in nature.

Transmission (electric) (verb): The movement or transfer of electric energy over an interconnected group of lines and associated equipment between points of supply and points at which it is transformed for delivery to consumers or is delivered to other electric systems. Transmission is considered to end when the energy is transformed for distribution to the consumer.

Transmission type (engine): The transmission is the part of a vehicle that transmits motive force from the engine to the wheels, usually by means of gears for different speeds using either a hydraulic “torque-converter” (automatic) or clutch assembly (manual). On front-wheel drive cars, the transmission is often called a “transaxle.” Fuel efficiency is usually higher with manual rather than automatic transmissions, although modern, computer-controlled automatic transmissions can be efficient.

Transportation sector: An energy-consuming sector that consists of all vehicles whose primary purpose is transporting people and/or goods from one physical location to another. Included are automobiles; trucks; buses; motorcycles; trains, subways, and other rail vehicles; aircraft; and ships, barges, and other waterborne vehicles. Vehicles whose primary purpose is not transportation (e.g., construction cranes and bulldozers, farming vehicles, and warehouse tractors and forklifts) are classified in the sector of their primary use.

Turbine: A machine for generating rotary mechanical power from the energy of a stream of fluid (such as water, steam, or hot gas). Turbines convert the kinetic energy of fluids to mechanical energy through the principles of impulse and reaction, or a mixture of the two.

U

Unconventional oil and natural gas production: An umbrella term for oil and natural gas that is produced

by means that do not meet the criteria for conventional production. Note: What has qualified as “unconventional” at any particular time is a complex interactive function of resource characteristics, the available exploration and production technologies, the current economic environment, and the scale, frequency, and duration of production from the resource. Perceptions of these factors inevitably change over time and they often differ among users of the term

Undiscovered resources: Those economic resources of crude oil and natural gas, yet undiscovered, that are estimated to exist in favorable geologic settings.

V

Vehicle fuel consumption: The quantity of fuel used by vehicles. Vehicle fuel consumption is computed as the vehicle miles traveled divided by the fuel efficiency reported in miles per gallon (mpg).

Vehicle miles traveled (VMT): The number of miles traveled nationally by vehicles for a period of 1 year. VMT is either calculated using two odometer readings or, for vehicles with less than two odometer readings, imputed using a regression estimate.

Volatile organic compounds (VOCs): Organic compounds that participate in atmospheric photochemical reactions.

W

Wall insulation: Insulating materials within or on the walls between heated areas of the building and unheated areas or the outside. The walls may separate air-conditioned areas from areas not air-conditioned.

Waste heat recovery: Any conservation system whereby some space heating or water heating is done by actively capturing byproduct heat that would otherwise be ejected into the environment. In commercial buildings, sources of waste-heat recovery include refrigeration/air-conditioner compressors, manufacturing or other processes, data processing centers, lighting fixtures, ventilation exhaust air, and the occupants themselves. Not to be considered is the passive use of radiant heat from lighting, workers, motors, ovens, etc., when there are no special systems for collecting and redistributing heat.

Watt: The unit of electrical power equal to one ampere under a pressure of one volt. A watt is equal to 1/746 horsepower.

Watt-hour: The electrical energy unit of measure equal to one watt of power supplied to, or taken from, an electric circuit steadily for one hour.

Weather stripping or caulking: Any of several kinds of crack-filling material around any windows or doors to the outside used to reduce the passage of air and moisture around moveable parts of a door or window. Weather stripping is available in strips or rolls of metal, vinyl, or foam rubber and can be applied on the inside or outside of a building.

Well: A hole drilled in the earth for the purpose of (1) finding or producing **crude oil** or **natural gas**; or (2) producing services related to the production of crude or natural gas.

Wellhead: The point at which the crude (and/or natural gas) exits the ground. Following historical precedent, the volume and price for crude oil production are labeled as “wellhead,” even though the cost and volume are now generally measured at the lease boundary. In the context of domestic crude oil price

data, the term “wellhead” is the generic term used to reference the production site or lease property.

Wet natural gas: Natural gas containing sufficient heavier hydrocarbons such as propane, butane, and pentane that condensation of the heavier hydrocarbons may occur during transport. May also contain nonhydrocarbon gases including water vapor, carbon dioxide, hydrogen sulfide, nitrogen and trace amounts of helium.

Wind energy: Kinetic energy present in wind motion that can be converted to mechanical energy for driving pumps, mills, and electric power generators.

Wind turbine: Wind energy conversion device that produces electricity; typically three blades rotating about a horizontal axis and positioned up-wind of the supporting tower.

Wood energy: Wood and wood products used as fuel, including round wood (cord wood), limb wood, wood chips, bark, sawdust, forest residues, charcoal, pulp waste, and spent pulping liquor.

