

[COMMITTEE PRINT]

**ENERGY PROGRAM**

**5**

**GLOSSARY OF ENERGY TERMS**

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PREPARED FOR THE  
**COMMITTEE ON WAYS AND MEANS  
HOUSE OF REPRESENTATIVES**

BY THE STAFF OF THE  
**JOINT COMMITTEE ON TAXATION**



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### INTRODUCTION

This pamphlet is the fifth in a series prepared for use by the Committee on Ways and Means during its consideration of the tax proposals in the Administration's proposed energy program.

The pamphlet provides a glossary of energy terms and abbreviations listed in alphabetical order. The glossary is intended to provide, as much as possible, a concise explanation of terms relating to energy and energy-related tax issues. The glossary is not intended to provide exhaustive, technical definitions, but rather practical, energy-related explanations which do not require special scientific or legal expertise.



## ENERGY TERMS

### *Acre-foot*

A measure of large quantities of surface or underground water, equal to the volume of water required to cover one acre of surface to a depth of one foot or 43,560 cubic feet.

### *Ad valorem tax*

An *ad valorem* tax is a tax imposed as a percentage of the value of, or price for, a property, service, etc., as contrasted with a tax set at an absolute amount.

### *Anthracite coal*

An extremely hard coal which provides substantial heat without much flame or smoke. The most extensive reserves of anthracite are found in eastern Pennsylvania. Other reserves are found in southwestern Virginia, Arkansas and Colorado. Production of this type of coal has decreased significantly over the past few years. Anthracite is used for space heating; some is shipped to U.S. military installations overseas for this purpose.

### *API gravity*

The standardized specific gravity of crude oil and refined products established by the American Petroleum Institute (API), now used worldwide. Specific gravity is relative density, a comparison of the density of a volume of oil to the density of the same volume of water. The gravity of water on the API scale is 10°. Very heavy crude oil is 11° or 12°, very light crude is 40°; gasoline is about 60°.

### *Aramco*

Aramco (the Arabian-American Oil Company) is a U.S. corporation owned jointly by four U.S. oil companies: Exxon, Mobil, Texaco, and Standard Oil of California. All of its operations are within Saudi Arabia. Its major operation there is the extraction of crude oil, which it then sells to foreign subsidiaries owned by Aramco's shareholders for distribution and sale primarily in Europe (some amounts are imported into the United States). The Saudi Arabian Government has acquired a 60 percent interest in the operations of Aramco, and negotiations are proceeding for a 100-percent takeover.

### *Arithmetic mean*

The ordinary average of a series of numbers, computed by dividing the sum of the series by the number of numbers in the series.

*Ash*

Noncombustible mineral matter contained in coal. These minerals are generally similar to ordinary sand, silt and clay in chemical and physical properties.

*Automatic energy control systems*

Equipment, for example, thermostats, for controlling energy usage in space heating or cooling or manufacturing processes in a way which automatically minimizes such energy usage.

*Barrel*

A liquid measure of oil which equals 42 American gallons, or between 280-380 lbs, depending on API gravity. An average barrel of crude oil contains 5.8 million BTU's.

*Barrels per day*

A customary unit of measurement of rates of output of oil fields, and throughput of pipe lines, refineries and marketing facilities. Reference ordinarily is to the average number of barrels per calendar day over a specified period, usually a year. Abbreviated bpd or B/D.

*Base production control level*

The quantity of oil produced on a particular property below which oil production is considered "old oil" or lower tier oil under current price control regulations. Production in excess of the base production control level (abbreviated BPCL) is considered "new oil" or upper tier oil.

Currently the BPCL in any month is determined by first computing the total number of barrels of crude oil produced and sold from the property during calendar year 1975, divided by 365, and multiplied by the number of days in the particular month during 1975. A producer may elect to use the total number of barrels of crude oil produced and sold from the property during calendar year 1972, divided by 366, and multiplied by the number of days in the particular month during 1972. The producer then determines his BPCL by reducing this amount by a depletion factor which is related to the rate at which oil production on the property declined between 1972 and 1975.

*Bituminous coal*

A soft coal which yields substantial smoke and ash and which is the most prevalent type of coal mined in the United States. Extensive reserves of this coal are found in most of the Appalachian States, across the Central Plains States, and in some of the Rocky Mountain States. Generally, bituminous coal has a lower heat value than anthracite (hard coal) and contains a higher percentage of ash and sulfur. However, there are exceptions to this rule. High quality bituminous coal which exhibits certain properties is used largely to produce coke for the steel industry. It is also used for electric power generation. High quality bituminous coal can be used for space heating.

*Boiler fuel*

Material which is used to produce heat or power in a steam generator.

*Branded independent marketer*

A person who is engaged in the marketing or distribution of refined petroleum products pursuant to (1) an agreement or contract with a refiner (or a person who controls, is controlled by, or is under common control with a refiner) to use a trademark, trade name, service mark, or other identifying symbol or name owned by such refiner (or such other person), or (2) an agreement or contract under which any such person engaged in the marketing or distribution of refined petroleum products is granted authority to occupy premises owned, leased, or in any way controlled by a refiner (or person who controls, is controlled by, or is under common control with a refiner), but who is not affiliated with, controlled by, or under common control with any refiner (other than by means of a supply contract, or an agreement or contract described in parts (1) or (2) of this definition), and who does not control such refiner.

*Breeder reactor*

A reactor which both produces and consumes fissionable fuel, particularly a reactor which produces more than it consumes. For example, a plutonium fuel cycle nuclear reactor which produces more plutonium from uranium than it uses, thereby enlarging the fuel potential. There are three types of breeder reactors: the liquid metal fast breeder; the gas cooled fast breeder; and the molten salt breeder. (See "reactor.")

*British Thermal Unit (BTU)*

The amount of energy required to raise the temperature of 1 pound of water by 1 degree fahrenheit, and about equal to 252 calories.

*BTU equivalency price*

The price of a particular source of energy which would cause it to have the same price per unit of energy as some other source of energy. Thus, if a barrel of oil contains 6 times as much energy as one thousand cubic feet (mcf) of natural gas, and if oil costs \$12 per barrel, the BTU equivalency price of natural gas relative to oil would be \$2 per mcf.

*Ceiling price*

The maximum price at which a commodity, such as oil or gas, may be legally sold under a regime of price controls. (See lower tier ceiling price and upper tier ceiling price.)

*CEQ*

Council on Environmental Quality.

*Coal gasification*

A process, not yet commercially viable in the United States, which converts coal to a gas which is suitable for use as a fuel. The gas produced may be either a high-Btu or a low-Btu fuel. High-Btu gas is similar to natural gas and will range in energy content from 900 to 1,000 Btu per cubic foot. Low-Btu gas may range as low as 200 Btu per cubic foot.

*Coal liquefaction*

A process, not yet commercially viable in the United States, which produces liquid petroleum from coal.

*Cogeneration*

Production of electricity from steam, heat, or other forms of energy produced primarily for uses other than the generation of electricity. Various combinations of cogeneration can be applied in industry to increase fuel efficiency.

*Combustible gas recovery system*

Equipment used to recover unburned fuel from combustion exhaust gases.

*Combustion*

The act or instance of burning; a chemical process (as in oxidation) accompanied by the evolution of light and heat.

*Condensate*

Hydrocarbons that are in the gaseous state underground at high pressures, but which become liquid at the surface or when underground pressures are significantly reduced.

*Crude oil*

Oil in its natural state, before refining or processing.

*Crude oil domestic production*

Domestic production is crude oil produced in the United States or from the continental shelf and includes condensate which is not liquified at a gas processing plant.

*Crude oil imports*

The volume of crude oil imported which is reported by receiving refineries, including crude oil entering the U.S. through pipelines from Canada.

*Crude oil input to refineries*

Total crude oil used as input for the refining process, less crude oil lost or used for refinery fuel.

*Crude oil stocks*

Inventories of crude oil held at refineries and at pipeline terminals.

*Dealer tankwagon price*

The price at which a dealer purchases gasoline from a distributor or a jobber.

*Deep mining*

The exploitation of coal or mineral deposits at depths exceeding about 1,000 feet. Coal is usually deep mined at not more than 1,500 feet. Mineral mines are deeper.

*Degree day*

A unit, based upon temperature difference and time, used in estimating fuel consumption and specifying nominal heating load in winter. For any one day when the mean temperature is less than 65° F., there exist as many degree days as there are Fahrenheit degrees difference in the temperature between the average temperature for the day and 65° F.

The number of degree days during a year equals the sum of degrees by which the mean temperature for each day of the year falls below 65°F.

*Demonstrated coal reserve base*

Measured economically recoverable quantities of bituminous coal and anthracite located in beds 28 inches or more thick, and subbituminous coal in beds 60 or more inches thick which are located in depths up to 1,000 feet. The demonstrated coal reserve base includes also small quantities of coal located in beds thinner and/or deeper than coal presently mined, for which there is evidence that mining is commercially feasible at this time. The data for lignite include beds 60 inches or thicker that can be surface mined. These are generally located at depths no greater than 120 feet. In general, the amount of coal that can be recovered from a deposit ranges from 40 to 90 percent of the reserve base.

*Distillate fuel oil*

The lighter fuel oils condensed from gases during the refining process. Included are products known as American Society for Testing Materials (ASTM) grades Nos. 1 and 2 heating oils, diesel fuels, and No. 4 fuel oil. The major uses of distillate fuel oils include heating, fuel, fuel for diesel engines, and railroad diesel fuel.

*Domestic demand for refined petroleum products*

A calculated value, computed as domestic production plus net imports (imports less exports), less the net increase inventories.

*Double glazing*

Glass sheets which create one or more sealed air spaces in order to resist heat flow.

*Drilling footage*

The depth of a well, or alternatively, the sum of the depths of all wells drilled in a period of time.

*Dry hole*

A completed well drilled that does not yield oil or gas in commercially marketable quantities.

*Economizer*

Equipment used to recover energy from combustion exhaust gases to preheat boiler feedwater.

*ECPA*

Energy Conservation and Production Act of 1976.

*Electrostatic precipitator*

A device to remove certain solid pollutants (dust) from a gas, for example, from the exhaust from power plants. The dust particles are charged either positively or negatively and are therefore attracted to each other and to an oppositely charged receptacle in the bottom of the precipitator. Thus, they are removed from the gases rather than being discharged into the air.

*Energy action*

Certain energy-related powers which the Congress has delegated to the President under the Energy Policy and Conservation Act of 1975 (EPCA), as amended by the Energy Conservation and Production Act of 1976. Before the President exercises any of these powers, i.e., implements any energy action, he must submit it to both Houses of Congress where it is subject to an either-House congressional veto for 15 days after its transmittal. Matters which are treated as energy actions are specifically legislated and include exemption from crude oil or petroleum price or allocation regulations, emergency conservation and rationing measures, and exclusive Federal authority to import and purchase foreign petroleum and petroleum products.

*Entitlement program*

Under present law, there is an entitlements program which is designed to equalize the cost of crude oil to refineries in the United States, regardless of their actual mix of price-controlled and uncontrolled oil. Those U.S. refineries using more than the national average percentage of price-controlled crude oil must buy entitlements from refineries using less than the national average. This purchase and sale of entitlements among refiners offsets the advantages that would otherwise result for the refiners who have access to a disproportionate amount of price-controlled crude oil. The FEA sets the price of entitlements each month based on price differences between old, new and stripper oil. Small refiners receive advantages under the entitlements program.

*Environmental impact statements*

The analytical statements that balance costs and benefits with regard to environmental effects of a Federal decision. Required by the National Environmental Policy Act.

*EPA*

Environmental Protection Agency. A Federal agency created in 1970 to permit coordinated and effective governmental action for protection of the environment by the systematic abatement and control of pollution through integration of research, monitoring, standard setting and enforcement activities.

*EPCA*

Energy Policy and Conservation Act of 1975.

*ERDA*

Energy Research and Development Administration. Created in October, 1974, by the Energy Reorganization Act of 1974. ERDA and the Nuclear Regulatory Commission are the successors to the abolished Atomic Energy Commission.

*ESECA*

Energy Supply and Environmental Coordination Act of 1974.

*Ethane*

A colorless, odorless gaseous hydrocarbon found in natural gas and used especially as a fuel or a petrochemical feedstock.

*Excise tax*

An excise tax is usually a tax imposed on the sale of a commodity. The tax may be expressed as a percentage of the sales price, e.g., 5 percent of the price paid, or as a specific amount per unit sold, e.g., 4 cents per gallon of gasoline. In practice, excise taxes are levied on all levels of commercial transactions and often have other names.

Excise taxes include taxes on: sales (e.g., retailers taxes, manufacturers taxes, alcoholic beverage taxes, and tobacco taxes) or other transfers (e.g., estate and gift taxes), employment or wages (e.g., payroll taxes for social security, medicare, unemployment compensation) using facilities or services (e.g., telephone tax, taxes on transportation by air, highway use tax, and airway use tax), using certain articles (e.g., adjunct to retailers and manufacturers taxes), engaging in certain occupations (e.g., wagering, selling alcoholic beverages, and selling tobacco), exercising privileges (e.g., tax on private foundations investment income), and engaging or failing to engage in certain transactions (e.g., taxes on public charities, private foundations, qualified pension, etc., plans, and real investment trusts).

*FEA*

Federal Energy Administration. An agency established in May, 1974, to deal with energy allocation and supply problems.

*Firm natural gas service*

High priority gas service in which the pipeline company is under contract to deliver a specified volume of gas to the customer on a non-interruptible basis. Residential and small commercial facilities usually fall into this category.

*Fission*

The splitting of an atomic nucleus resulting in the release of large amounts of energy. All nuclear reactors currently in use are fission reactors.

*Fleet average fuel economy*

The harmonic average fuel economy of the automobiles sold by a particular manufacturer, or alternatively, of all cars sold in the United States.

*Flue gas desulfurization (FGD)*

Removal of sulfur from smokestacks with "scrubbers." (Same as "gas desulfurization.")

*Fossil fuel*

Any fuel, such as coal, oil, and natural gas, derived from the remains of ancient plants and animals. These sometimes are called conventional fuels or conventional energy sources (as compared with nuclear, power, solar and wind energy, etc.) because the bulk of energy is derived from them and most of the industrial economy is based upon them.

*FPC*

The Federal Power Commission, which regulates the sale, transportation and price of natural gas and of wholesale electric power moved in interstate commerce.

*Fusion*

The union of atomic nuclei to form heavier nuclei resulting in the release of enormous quantities of energy when certain light elements unite. Fusion reactors are not technologically possible, in part, because the production of energy by fusion can only take place at enormous temperatures under controlled circumstances. However, in the long run if the technological problems can be solved, fusion may provide virtually unlimited amounts of energy because the raw materials necessary for fusion can be extracted from sea water, rocks and other plentiful materials.

*Gas cooled reactor*

Nuclear reactor whose core is cooled by gas, usually liquid sodium.

*Gas desulfurization*

Removal of sulfur from smokestacks with "scrubbers." (Same as "flue gas desulfurization".)

*GATT*

The General Agreement on Tariffs and Trade (GATT), which took effect in 1948, is a multilateral trade agreement of reciprocal rights and obligations. Currently, more than 80 countries are full contracting parties to GATT. It provides a set of rules to govern the conduct of international trade, procedures to settle trade disputes, and a framework for negotiations to reduce obstacles to international trade.

*Geothermal energy*

Geothermal energy is the natural heat contained in the earth's crust. Geothermal energy may rise to the surface through natural pressures. It can also be tapped by drilling. Five types of geothermal resources have been defined: hydrothermal convective, geopressed, hot dry rock, magma, and normal gradient. Of these types, the hydrothermal convection systems, which occur where ground waters infiltrate into formations of heated rock, represent a small fraction of the total resource, but provide the only resource presently being utilized (primarily in the form of dry steam) and the greatest potential for immediate industrial expansion. The other four forms of geothermal energy represent the bulk of the resource, but each of them requires substantial technological research, development and demonstration to bring it to the point of commercial exploitation. There are about 90 known places in the continental United States where geothermal steam could be harnessed for power. These are in California, Idaho, Nevada and Oregon. Geothermal energy can be used to generate electric power, to heat residences and industries, and for process heat.

*Harmonic mean*

When averaging miles per gallon (mpg) across a series of autos, the harmonic mean or average is the inverse or reciprocal of the average gallons per mile of the cars. The reciprocal of a number equals one divided by that number. For example, if there are two cars, one with mpg of 10 and the other with mpg of 20, the harmonic mean is  $13\frac{1}{3}$  mpg, as contrasted with the arithmetic mean of 15 mpg. (The average of  $1/10$  and  $1/20$  is  $1/13\frac{1}{3}$ .) Generally, averages of gas mileage are computed harmonically.

*Heat exchanger*

Equipment used to recover energy, usually in the form of waste heat, which transfers heat between high temperature fluids of industrial processes and low temperature fluids, and which consists, in part, of a fixed heat transfer surface separating the two fluids.

*Heat pipe*

A device used to recover energy, usually in the form of waste heat, from high temperature fluids to heat low temperature fluids, and consists, in part, of a sealed heat transfer chamber containing a working fluid which is alternatively vaporized and condensed as it travels from one end to the other.

*Heat pump*

Equipment used to heat, circulate and filter, or alternatively cool, air in environmental spaces consisting of, as a minimum, a compressor, two heat transfer devices, one indoors and one outdoors, and a means for automatically controlling the heating and cooling functions.

*Heat wheel*

Equipment used to recover energy, usually in the form of waste heat, from exhaust gases to preheat incoming gases, and consisting, in part, of a regenerator which rotates through the two gas flows.

*Independent producer*

A person engaged in the extraction of oil or natural gas who is not also engaged in some other aspect of the oil or gas business, such as refining, transportation, or marketing.

*Indicated reserves*

Oil in the ground which is economically recoverable with secondary recovery.

*Inferred reserves*

Estimated additions to so-called "proved reserves" of oil or gas that result from revisions of estimates after the initial discovery (which are usually upward revisions), extensions of existing fields and certain other reasons. (See "proved reserves.")

*Insulation*

Material or assembly of materials used to resist heat flow between two spaces for heating or cooling purposes. The strength of insulation is measured in R-value. (See "R-value.")

*Interstate natural gas*

Natural gas transported by pipeline between two or more States or produced offshore. Interstate gas is subject to regulation by the Federal Power Commission.

*Intrastate natural gas*

Natural gas produced, transported and used within its State of origin. Intrastate gas is subject to State regulatory power or jurisdiction.

*Interruptible natural gas service*

Low priority gas service in which the pipeline company has the contractual option temporarily to terminate deliveries to customers by reason of needs of firm service customers or higher priority users. Large commercial facilities, industrial users, and electric utilities usually fall into this category.

*Jet fuel*

Includes both naphtha-type and kerosene-type fuels meeting standards for use in aircraft turbine engines. Although most jet fuel is used in aircraft, some is used for other purposes, such as for generating electricity in gas turbines.

*Jobber*

A petroleum distributor who purchases refined products from a refiner or terminal operator for the purpose of reselling to retail outlets and commercial accounts or for the purpose of retailing through the jobber's own retail outlets.

*Jobber margin*

The difference between the price at which a jobber purchases refined petroleum products from a refiner or terminal operator and the price at which the jobber sells to retail outlets. This does not reflect margins obtained by jobbers through retail sales or commercial accounts.

*Jobber price*

The price at which a petroleum jobber purchases refined products from a refiner or terminal operator.

*Kilowatt*

One thousand watts.

*Long ton*

Two thousand, two hundred and forty (2,240) pounds.

*Kilowatt-hour*

A unit of work or energy equal to that expended by one kilowatt in one hour.

*Landed price*

The price of imported crude oil after transportation costs and profits have been added to the sale price of oil at its source; i.e., the cumulative cost of oil at its destination before processing.

*Lease condensate*

Petroleum that emerges from the well as gas but is converted to liquids at the wellhead.

*Light water reactor*

A nuclear reactor whose core is cooled by ordinary water. There are two commercial light-water reactor types—the boiling water reactor (BWR) and the pressurized water reactor (PWR).

*Lignite*

A low grade coal of a variety intermediate between peat and bituminous coal found principally in western North Dakota and eastern Montana. Lignite, which is sometimes called "brown coal" has a low heat value and a high moisture content. It is expensive to transport and is therefore mainly used for steam electric power generation near lignite mines.

*Limited work authorization*

A Limited Work Authorization (LWA) may be granted by the Atomic Safety and Licensing Board of the Nuclear Regulatory Commission to an applicant who wants to construct a nuclear powerplant providing that the project has been cleared for all requirements of the National Environmental Protection Act and that the geologic and topographic suitability of the reactor site has been found satisfactory. The LWA allows an applicant to proceed with site excavation, install temporary construction and service facilities, construct service roads, and erect structures and components not subject to normal quality assurance inspections. It may save a utility from 6 to 8 months in total construction time. However, because the ultimate approval of a construction permit is based on all evidence revealed during the licensing hearings, the successful award of an LWA is no guarantee that a construction permit will also be granted.

*Liquid metal fast breeder reactor*

A breeder reactor which is cooled by a liquid metal such as liquid sodium. (See "breeder reactor.")

*LNG*

Liquefied natural gas (LNG) is a clear flammable liquid generated by refrigerating natural gas.

*Lower tier ceiling price*

The ceiling price of "old oil." The lower tier ceiling price for a particular grade of domestic crude oil in a particular field is the sum of (1) the highest posted price at 6 a.m., local time, May 15, 1973, for transactions in that grade of crude oil in that field; or if there was no posted price in that field for that grade of domestic crude oil, the related price for that grade of domestic crude oil which is most similar in kind and quality in the nearest field for which prices were posted; and (2) \$1.35 per barrel.

*Lower tier crude oil*

Old crude oil, as defined below. Also called first tier oil.

*LPG*

Liquefied petroleum gas, including propane and butane, and propane/butane mixes, but not ethane.

*Major brand of gasoline*

Lundberg Survey, Inc., defines a major brand of gasoline as one of an integrated company that produces, refines, transports, and markets in interstate commerce under its own brand name in 20 or more States.

*MCF*

An abbreviation for a thousand cubic feet of gas, which, in the case of natural gas, contains approximately one million BTU's.

*MMCF*

An abbreviation for one million cubic feet of gas.

*Megawatt*

One million watts.

*Megawatt-century*

The quantity of electricity produced during 100 years by a generating plant which produces 1 million watts constantly over the 100-year period.

*Motor gasoline production*

Total production of motor gasoline by refineries, measured at refinery outlet. Relatively small quantities of motor gasoline are produced at natural gas processing plants, but these quantities are not included.

*Motor gasoline stocks*

Primary motor gasoline inventories held by gasoline producers. Inventories held at natural gas processing plants are not included.

*MWE*

An abbreviation for megawatts.

*Natural gas*

A naturally occurring mixture of hydrocarbons and varying quantities of nonhydrocarbons that exists either in the gaseous phase or in solution with crude oil in underground reservoirs; primarily methane and ethane.

*Natural gas liquid products*

Products obtained from natural gasoline plants, cycling plants, and fractionators after processing the natural gas. Included are ethane, liquefied petroleum (LP) gases (propane, butane, and propane-butane mixtures), natural gasoline, plant condensate, and minor quantities of finished products such as gasoline, special naphthas, jet fuel, kerosene, and distillate fuel oil.

*New crude oil*

Under existing price control regulations, new oil is oil produced on a property in excess of the base production control level, defined above. Also called upper tier or second tier oil.

New crude oil prices are generally controlled at a price averaging \$11.45 per barrel.

*New gas*

Under the Administration proposal, natural gas produced from a well more than 2½ miles away from a producing well or more than 1,000 feet deeper than any well within 2½ miles or from an offshore lease entered after April 20, 1977.

*New crude oil*

Under the Administration proposal, oil discovered after April 20, 1977, in a well that is either more than 2½ miles from an existing on-shore well, or more than a thousand feet deeper than any well within the 2½ mile radius, or oil from an offshore lease entered into after that date. The price of new oil would rise ratably over a 36-month period from the current controlled price for new oil (about \$11.45 per barrel) to the April 1977 price of imported oil (about \$14 per barrel) plus an inflation factor.

*Nonbranded independent marketer*

A person who is engaged in the marketing or distribution of refined petroleum products, but who (1) is not a refiner, (2) is not a person who controls, is controlled by, is under common control with, or is affiliated with a refiner (other than by means of a supply contract), and (3) is not a branded independent marketer.

*NRC*

Nuclear Regulatory Commission. (See also "ERDA.")

*Nuclear power plant*

Any device, machine, or assembly that converts nuclear energy into some form of useful power, such as mechanical or electrical power.

A nuclear fuel core replaces fossil fuel in the generation of steam which in turn drives turbines which generate electricity. A nuclear fuel core contains uranium, fuel which has been enriched in its fissionable Uranium-235 (U-235) content. When U-235 is bombarded by neutrons, the uranium atoms release energy in the form of heat plus additional neutrons which sustain the nuclear reaction. The heat is transferred to the primary coolant, which can be boiling water, pressurized sub-cooled water, gas or liquid metal. The resulting steam turns a turbine generator which in turn produces electricity.

*Nuclear reactor*

A device in which a fission chain reaction can be initiated, maintained, and controlled. Its essential component is a core with fissionable fuel. It usually has a moderator, reflector, shielding coolant and control mechanisms. It is the basic machine of nuclear power.

*Oil shale*

A convenient expression used to cover a range of materials containing organic matter (Kerogen) which can be converted into crude shale oil, gas and carbonaceous residue by heating.

*Oil swap*

Exportation of domestic oil made as part of an exchange in return for an equivalent amount of foreign oil generally in order to reduce costs.

*Old crude oil*

The total number of barrels of crude oil produced and sold from a property in a specific month up to the amount of base period production. Base period production equals the lesser of 1972 or 1975 production, with a downward adjustment to take account of depletion of the oil field. (See "base production control level.")

Old crude oil is lower tier oil. It is all oil that is neither new oil nor stripper oil. It is controlled at a price averaging about \$5.17 per barrel. (The \$5.17 figure is an average of prices ranging from about \$2.50 to about \$7.50 per barrel, depending on the quality and location of the oil.)

*OPEC*

OPEC (the Organization of Petroleum Exporting Countries) was founded in 1960 to coordinate petroleum policies of the members. The members and dates of membership are: Abu Dhabi (1967); Algeria (1969); Ecuador (1973); Indonesia (1962); Iran (1960); Iraq (1960); Kuwait (1960); Libya (1962); Nigeria (1971); Qatar (1961); Saudi Arabia (1960); and Venezuela (1960). OPEC headquarters is in Vienna, Austria. It is estimated that in 1976 approximately one-half of the total world crude oil production was produced by OPEC members.

*Petrochemical feedstocks*

Organic chemicals and analogous materials such as crude oil, residual fuel oil and refined petroleum products which are processed in industrial plants and substantially converted to other products containing hydrocarbon equal to at least 30 percent of the initial product (feedstock) fed into the plant.

*Plowback*

A deduction or credit provision whereby all or part of a tax is forgiven if the taxpayer invests certain amounts, generally some part of the profit upon which the tax is imposed, in a qualified manner. The percentage of the tax forgiven, and the nature of the investments which qualify under the provision, depend upon legislative determination.

*Plutonium*

A radioactive metallic element chemically similar to uranium. Plutonium undergoes slow disintegration with the emission of a helium nucleus to form uranium 235, which is fissionable.

*Power ascension nuclear powerplant*

A nuclear powerplant that has been licensed by the Nuclear Regulatory Commission to operate, but which is in the initial testing phase during which production of electricity may not be continuous. In general, when the electric utility is satisfied with the plant's performance, it formally accepts the plant from the manufacturer, and places it in commercial operation status. A request is then submitted to the appropriate utility rate commission to include the powerplant in the rate base calculation.

*Preheater*

Equipment used to recover energy, usually in the form of waste heat from either combustion exhaust gases or steam, and to preheat incoming combustion air or boiler feedwater, and consisting, in part, of a fixed heat transfer surface separating the two fluids.

*Primary recovery*

The initial extraction of oil from the ground, bringing it to the surface by natural pressures or by pumping. Primary recovery includes some methods of injecting fluids into or near an oil or gas reservoir to delay the inevitable decline in pressure resulting from oil extraction (so-called "pressure maintenance").

*Primary stocks of refined petroleum products*

Inventories held at refineries, bulk terminals, and pipelines. They do not include inventories held in secondary storage facilities, such as those held by jobbers, dealers, independent marketers, and consumers.

*Propane*

The chemical  $C_3H_8$  in its commercial form made from natural gas or natural gas liquids and including propane-butane mixes and other mixtures in which propane constitutes greater than ten (10) percent of the mixture by weight. Excluded from the definition are mixtures containing propane (other than propane-butane mixes) when such mixtures are used for refinery fuel use.

Propane is used for crop drying and for household space heating in rural areas. Heaviest use tends to be in rural areas of Midwestern farm States where grain is harvested. Some natural gas users stock propane as a substitute fuel in case of natural gas shortages.

*Property (as related to oil)*

Prior to September 1, 1976, a property was defined for FEA purposes as the right to produce domestic crude oil which arises from a lease or from a fee interest. On September 1, 1976 the definition of a property was changed so that a producer may treat as a separate property each separate and distinct producing reservoir subject to the same right to produce crude oil, if such reservoir is recognized by the appropriate governmental regulatory authority as a producing formation, i.e., reservoir that is separate and distinct from, and not in communication with, any other producing reservoir. Whether oil is considered old or new oil is determined with reference to a particular property.

*Proved reserves*

The amount of oil and gas reserves which can be extracted economically with existing technology. Proved reserves do not include "indicated reserves," as defined above, which are those economically recoverable with secondary recovery techniques.

*Quad*

An abbreviation of a quadrillion (a 1 followed by 15 zeroes), usually used to mean that many British Thermal Units (BTU's) of energy. A quad equals the energy that can be produced from approximately one trillion cubic feet of natural gas or 170 million barrels of oil (500,000 barrels per day).

*Reactor*

An apparatus in which a chain reaction of fissionable material is initiated and controlled.

*Recompletion well*

A well that is reentered and completed in a different reservoir or producing zone than the initial completion zone.

*Recuperator*

Equipment used to recover energy, usually in the form of waste heat, from combustion exhaust gases to preheat incoming combustion air, and consisting, in part, of a fixed heat transfer surface separating the two gas flows.

*Refined petroleum product imports*

Imports (into the 50 States and the District of Columbia) of motor gasoline, naphtha-type jet fuel, kerosene-type jet fuel, kerosene, distillate fuel oil, residual fuel oil, liquefied petroleum gases, petrochemical feedstocks, special naphtha, lubricants, waxes, asphalt, natural gas, plant condensate, and unfinished oils. Included are imports of fuels into bonded storage and receipts from U.S. territories.

*Refiner acquisition cost*

The cost to the refiner, including transportation, import duties and fees, of crude petroleum. The composite cost is the average of domestic and imported crude costs and represents the amount of crude cost which refiners may pass on to their customers under existing price control regulations.

*Reflective glass coating*

A thin film of material or assembly of materials, usually transparent, applied to glass to reflect solar heat.

*Regenerator*

A device used to recover energy by efficiently storing heat while exposed to high temperature gases and then releasing heat when exposed to low temperature gases.

*Reprocessing*

Chemical recovery of unburned uranium and plutonium and certain fission products from spent fuel elements that have produced power in a nuclear reactor.

*Residual fuel oil*

The heavier oils that remain after the distillate fuel oils and lighter hydrocarbons are boiled off in refinery operations. Included are products known as ASTM grades Nos. 5 and 6 oil, heavy diesel oil, Navy Special Oil, Bunker C oil, and acid sludge and pitch used as refinery fuels. Residual fuel oil is used for the production of electric power, for heating, and for various industrial purposes.

*Retrofitting*

The installation of a replacement device, piece of equipment or integrated unit on an existing structure or in an existing production process that will reduce energy consumption by making the direct use of energy more efficient or by increasing the efficiency of the production process. Retrofitting can also apply to the installation of equipment that permits the change from a scarce fuel, e.g., oil, to a more abundant fuel, e.g., coal.

*Rotary rig*

Machine used for drilling wells that employs a rotating tube attached to a bit for boring holes through rock.

*R-value*

A measure of the thermal (heat) resistance of a material. Its reciprocal is a measure of thermal conductance. Thermal conductance is measured by BTU's per square foot per hour per degree difference. Degree difference is the temperature difference between the two surfaces.

*Scrubber*

A device to remove sulphur from emissions from a smokestack.

*Secondary recovery*

A technique whereby pressurized water or gas is injected into an oil field to force the oil into a position where it can be pumped out of producing oil wells. There is no clearcut distinction between secondary recovery and tertiary recovery, defined below.

*Separative work unit*

The measure of work required to produce enriched uranium from natural uranium. Enrichment plants separate natural uranium feed material into two groups, an enriched product group with a higher percentage of U-235 than the feed material and a depleted tails group with a lower percentage of U-235 than the feed material. To produce 1 kilogram of enriched uranium containing 2.8 percent U-235, and a depleted tails assay containing 0.3 percent U-235 (requires 6 kilograms of natural uranium feed and 3 kilograms of separative work units (3 SWU)).

*Shale oil*

Low-sulphur, low-nitrogen oil which is processed from a rock containing organic matter (kerogen) and which is similar in nature and use to conventional crude oil.

*Short ton*

Two thousand pounds.

*Slurry pipeline*

A pipeline which carries finely ground coal suspended in a fluid, such as water or oil. Slurry pipelines require substantial water supplies where the coal is mined. The pipelines also require substantial, initial capital investments, and rights-of-way must be acquired. Purifying the water after its use in the pipeline has caused additional problems.

*Solar energy*

Energy produced through the use of equipment designed to generate power from the sun.

*Spot price*

The price of a commodity (such as coal) applying to immediate delivery, as distinguished from future delivery under a long-term contract.

*Strip mining*

A type of surface mining whereby overburden (earth and other surface material above the coal deposit) and coal are removed from successive long parallel cuts, with overburden from the second and successive cuts being placed in the previously mined cut. This system is practicable only where the coal lies close to the surface. Strip mines operate where the depth of the minable coal beds increases gradually, allowing mining to proceed at distances of up to a mile or more into the coal layer which is exposed at some point at or near the surface. This method is common in the Midwest and West.

*Stripper oil*

Oil produced from a stripper well property, as defined below. Stripper oil currently is not subject to price control and sells at the world price.

*Stripper well property*

A property whose average daily production of crude oil per well (excluding condensate recovered in nonassociated production) did not exceed 10 barrels per day during any preceding consecutive 12-month period beginning after December 31, 1972.

*Super tanker*

An oil-transporting tanker with a displacement greater than 100,000 deadweight tons. The U.S. presently has no port deep enough to accommodate the large tankers. Some tankers displace between 200,000 and 250,000 deadweight tons.

*Surface mining*

The obtaining of coal from the outcroppings, that is, coal layers exposed at some point at or near the earth's surface, or by the removal of surface material above the coal deposit as opposed to underground mining; or any mining at or near the surface. Also called strip mining; placer mining; opencast; opencut mining; open-pit mining.

*Synthetic natural gas (SNG)*

A product resulting from the manufacture, conversion, or reforming of petroleum hydrocarbons which may be easily substituted for or interchanged with pipeline quality natural gas.

*Tariff*

A payment to a government imposed on the importation of an article.

*Tertiary recovery*

A technique whereby steam or chemicals are injected into an oil field to liquefy viscous oil to make it easier to pump out. Includes techniques to heat oil in the reservoir to make it more liquid.

*Turbulator*

A small baffle placed in the upper passes of the firetubes of boilers to increase the rate of transfer of heat from combustion gases to the firetube surface.

*Uncontrolled crude oil*

Oil not subject to price controls, generally stripper oil.

*Unit train*

A system developed for delivering coal more efficiently in which a string of cars, with distinctive markings, and loaded to full visible capacity, is operated without stops along the way for cars to be cut in and out. In this way, the customer receives his coal quickly and the empty car is scheduled back to the coal fields as fast as it came.

*Unrecouped costs*

Costs of an oil refiner which have not been recovered in the current month's product prices but which have been banked for later use and which can be passed on in the future under existing price control regulations.

*Upper tier crude oil*

Same as "new crude oil," defined above.

*Upper tier ceiling price determination*

The upper tier ceiling price for a particular grade of domestic crude oil in a particular field is (1) the highest posted price on September 30, 1975, for transactions in that grade of upper tier crude oil in that field in September 1975, or if there was no posted price in that field for that grade of domestic upper tier crude oil, the related price for that grade of domestic crude oil which is most similar in kind and quality in the nearest field for which prices were posted; less (2) \$1.32 per barrel.

*Uranium*

A silvery, heavy, radioactive, polyvalent, metallic element, found especially in pitchblende and uraninite. An element basic to atomic energy sources.

*Waste heat boiler*

A boiler which uses waste heat as its primary energy source, usually in the form of combustion exhaust gases.

*Well*

Hole drilled for the purpose of finding or producing crude oil or natural gas or providing services related the production of crude oil or natural gas. Wells are classified as oil wells, gas wells, dry holes, stratigraphic tests, or service wells.

*Wellhead price*

The price received by the producer of oil or gas for sales of oil or gas taking effect at the oil or gas well.

*Windfall profits tax*

A tax imposed on sales at a price in excess of a specified base price. A windfall profits tax on crude oil usually contemplates decontrol of the price of domestically produced crude oil, and is intended to capture all or part of the difference between the controlled price and the higher world price. The tax rate equals some fraction of the difference between the actual selling price and the base price.

*World price of oil*

Currently, the price of crude oil set by the Organization of Petroleum Exporting Countries (OPEC).

*Yellowcake*

An oxide of uranium used to make nuclear fuel rods after further refinement. About 520 tons of ore must be milled to obtain one ton of yellowcake. Over the last 18 months, the price of yellowcake has risen from \$10 to \$40 per pound.

## APPENDIX

### Comparative Energy Contents of Coal, Oil, Natural Gas and Electricity

|  |    |                          |
|--|----|--------------------------|
| 1 ton bituminous coal                    | == | 23 million Btu           |
| 1 pound bituminous coal                  | == | 11,500 Btu               |
| 1 ton subbituminous coal                 | == | 17 million Btu           |
| 1 pound subbituminous coal               | == | 8,500 Btu                |
| 1 ton lignite                            | == | 13.5 million Btu         |
| 1 pound lignite                          | == | 6,750 Btu                |
| 1 barrel crude oil (42 gallons)          | == | 5.8 million Btu          |
| 1,000 cubic feet (1 MCF) natural gas     | == | 1.0 million Btu          |
| 1 Kilowatt hour of electricity           | == | 3,412 Btu                |
| 1 horsepowerhour of mechanical<br>energy | == | 0.746 kwhr or 2,545 Btu  |
| 1 million Btu                            | == | 0.17 B. crude oil        |
| "  | == | 7.1 gal. crude oil       |
| "  | == | 1000 MCF natural gas     |
| "  | == | 0.043 T. bituminous coal |
| "  | == | 86 lbs. bituminous coal  |
| "  | == | 293 kwhr                 |
| "  | == | 393 hphr                 |

Source: Library of Congress, Congressional Research Service.













