

Chapter 1 : energy | Definition of energy in English by Oxford Dictionaries

Energy can exist in a variety of forms, such as electrical, mechanical, chemical, thermal, or nuclear, and can be transformed from one form to another. It is measured by the amount of work done, usually in joules or watts.

Work and thus energy is frame dependent. For example, consider a ball being hit by a bat. In the center-of-mass reference frame, the bat does no work on the ball. But, in the reference frame of the person swinging the bat, considerable work is done on the ball. The total energy of a system is sometimes called the Hamiltonian, after William Rowan Hamilton. The classical equations of motion can be written in terms of the Hamiltonian, even for highly complex or abstract systems. These classical equations have remarkably direct analogs in nonrelativistic quantum mechanics. This formalism is as fundamental as the Hamiltonian, and both can be used to derive the equations of motion or be derived from them. It was invented in the context of classical mechanics, but is generally useful in modern physics. The Lagrangian is defined as the kinetic energy minus the potential energy. Usually, the Lagrange formalism is mathematically more convenient than the Hamiltonian for non-conservative systems such as systems with friction. A generalisation of the seminal formulations on constants of motion in Lagrangian and Hamiltonian mechanics and, respectively, it does not apply to systems that cannot be modeled with a Lagrangian; for example, dissipative systems with continuous symmetries need not have a corresponding conservation law. Chemistry In the context of chemistry, energy is an attribute of a substance as a consequence of its atomic, molecular or aggregate structure. Since a chemical transformation is accompanied by a change in one or more of these kinds of structure, it is invariably accompanied by an increase or decrease of energy of the substances involved. Some energy is transferred between the surroundings and the reactants of the reaction in the form of heat or light; thus the products of a reaction may have more or less energy than the reactants. A reaction is said to be exergonic if the final state is lower on the energy scale than the initial state; in the case of endergonic reactions the situation is the reverse. Chemical reactions are invariably not possible unless the reactants surmount an energy barrier known as the activation energy. This exponential dependence of a reaction rate on temperature is known as the Arrhenius equation. The activation energy necessary for a chemical reaction can be in the form of thermal energy. Biology Basic overview of energy and human life. In biology, energy is an attribute of all biological systems from the biosphere to the smallest living organism. Within an organism it is responsible for growth and development of a biological cell or an organelle of a biological organism. Energy is thus often said to be stored by cells in the structures of molecules of substances such as carbohydrates including sugars, lipids, and proteins, which release energy when reacted with oxygen in respiration. For example, if our bodies run on average at 80 watts, then a light bulb running at watts is running at 1. For tasks lasting a few minutes, a fit human can generate perhaps 1, watts. For an activity that must be sustained for an hour, output drops to around ; for an activity kept up all day, watts is about the maximum. Plants also release oxygen during photosynthesis, which is utilized by living organisms as an electron acceptor, to release the energy of carbohydrates, lipids, and proteins. Release of the energy stored during photosynthesis as heat or light may be triggered suddenly by a spark, in a forest fire, or it may be made available more slowly for animal or human metabolism, when these molecules are ingested, and catabolism is triggered by enzyme action. Any living organism relies on an external source of energy—radiant energy from the Sun in the case of green plants, chemical energy in some form in the case of animals—to be able to grow and reproduce. The food molecules are oxidised to carbon dioxide and water in the mitochondria C.

Chapter 2 : Energy - Wikipedia

a worker with boundless energy strength applies to the quality or property of a person or thing that makes possible the exertion of force or the withstanding of strain, pressure, or attack. use weight training to build your strength might implies great or overwhelming power or strength.

Alternative fuel vehicle converter: An organization including companies, government agencies and utilities , or individual that performs conversions involving alternative fuel vehicles. A vehicle designed to operate on an alternative fuel e. Alternative-rate DSM program assistance: These rates are intended to reduce consumer bills and shift hours of operation of equipment from on-peak to off-peak periods through the application of time-differentiated rates. For example, utilities often pay consumers several dollars a month refund on their monthly electric bill for participation in a load control program. American Indian Coal Lease: A lease granted to a mining company to produce coal from land held in trust by the United States for Native Americans, Native American tribes, and Alaska Natives in exchange for royalties and other revenues. Advanced Metering Infrastructure is a term denoting electricity meters that measure and record usage data at a minimum, in hourly intervals, and provide usage data to both consumers and energy companies at least once daily. An alloy of silica and hydrogen, with a disordered, noncrystalline internal atomic arrangement, that can be deposited in thin-film layers a few micrometers in thickness by a number of deposition methods to produce thin-film photovoltaic cells on glass, metal, or plastic substrates. The depreciation, depletion, or charge-off to expense of intangible and tangible assets over a period of time. In the extractive industries, the term is most frequently applied to mean either 1 the periodic charge-off to expense of the costs associated with non-producing mineral properties incurred prior to the time when they are developed and entered into production or 2 the systematic charge-off to expense of those costs of productive mineral properties including tangible and intangible costs of prospecting, acquisition, exploration, and development that had been initially capitalized or deferred prior to the time the properties entered into production, and thereafter are charged off as minerals are produced. The unit of measurement of electrical current produced in a circuit by 1 volt acting through a resistance of 1 Ohm. Automated Meter Reading is a term denoting electricity meters that collect data for billing purposes only and transmit this data one way, usually from the customer to the distribution utility. Decomposition in the absence of oxygen, as in an anaerobic lagoon or digester, which produces CO₂ and CH₄. A liquid-based organic waste management installation characterized by waste residing in water at a depth of at least 6 feet for periods of 30 to days. Services that ensure reliability and support the transmission of electricity from generation sites to customer loads. Such services may include load regulation, spinning reserve, non-spinning reserve, replacement reserve, and voltage support. The annual fuel consumption divided by the product of design firing rate and hours of operation per year. 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. This fuel typically has a heat content of 15 million Btu per ton or less. 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. The American Petroleum Institute, a trade association. American Petroleum Institute measure of specific gravity of crude oil or condensate in degrees. An arbitrary scale expressing the gravity or density of liquid petroleum products. The measuring scale is calibrated in terms of degrees API; it is calculated as follows: Coal production plus imports of coal, coke, and briquets minus exports of coal, coke, and briquets plus or minus stock changes. The sum of "Production" and "Imports" less "Exports" may not equal "Consumption" due to changes in stocks, losses, unaccounted-for coal, and special arrangements such as the United States shipments of anthracite to United States Armed Forces in Europe. Apparent consumption, natural gas international: Apparent consumption, petroleum international:

Consumption that includes internal consumption, refinery fuel and loss, and bunkering. For countries in the Organization for Economic Cooperation and Development OECD , apparent consumption is derived from refined product output plus refined product imports minus refined product exports plus refined product stock changes plus other oil consumption such as direct use of crude oil. For countries outside the OECD, apparent consumption is either a reported figure or is derived from refined product output plus refined product imports minus refined product exports, with stock levels assumed to remain the same. Apparent consumption also includes, where available, liquefied petroleum gases sold directly from natural gas processing plants for fuel or chemical uses. The product of the voltage in volts and the current in amperes. It comprises both active and reactive power. It is measured in "volt-amperes" and often expressed in "kilovolt-amperes" kVA or "megavolt-amperes" MVA. A piece of equipment, commonly powered by electricity, used to perform a particular energy-driven function. 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. A relative comparison of trends in new-model efficiencies for major appliances and energy-using equipment. Efficiencies for each year were efficiencies of different model types that were weighted by their market shares. The National Appliance Energy Conservation Act of established minimum efficiency standards for major home appliances, including furnaces, central and room air conditioners, refrigerators, freezers, water heaters, dishwashers, and heat pumps. Most of the standards took effect in The standards for clothes washers, dishwashers, and ranges took effect in , because they required only minor changes in product design, such as eliminating pilot lights and requiring cold water rinse options. The standards for central air conditioners and furnaces took effect in, because it took longer to redesign these products. Appliance efficiency standards for refrigerators took effect in The simultaneous purchase and sale of identical or similar assets across two or more markets in order to profit from a temporary price discrepancy. Hydrocarbons characterized by unsaturated ring structures of carbon atoms. Commercial petroleum aromatics are benzene, toluene, and xylene BTX. Coal in the condition as received by the user. As-received condition or as-received basis coal: Coal in the condition as received by the consumer or the laboratory analyzing the coal. A group of naturally occurring minerals that separate into long, thin fibers. Asbestos was used for many years to insulate and fireproof buildings. Asbestos treatment methods include removal, encapsulation or sealing, and enclosure behind a permanent barrier. Impurities consisting of silica, iron, alumina, and other noncombustible matter that are contained in coal. Ash increases the weight of coal, adds to the cost of handling, and can affect its burning characteristics Ash content is measured as a percent by weight of coal on an "as received" or a "dry" moisture-free, usually part of a laboratory analysis basis. A dark brown-to-black cement-like material obtained by petroleum processing and containing bitumens as the predominant component; used primarily for road construction. It includes crude asphalt as well as the following finished products: The conversion factor for asphalt is 5. A unique string of alphanumeric characters that identifies an assembly, bundle, or canister for aspecific reactor in which it has been irradiated. Each assembly is characterized by a fabricator, rod-array size, and model type. An eight-digit assembly type code is assigned to each assembly type based on certain distinguishing characteristics, such as the number of rods per assembly, fuel roddiameter, cladding type, materials used in fabrication, and other design features. The annual or biennial work performed on a mining claim or claims , after claim location and before patent, to benefit or develop the claim and to protect it from relocation by third parties. Assistance for heating in winter: Assistance for weatherization of residence: The household received services free, or at a reduced cost, from the Federal, State, or local Government. Any of the following services could have been received: See Associated-dissolved natural gas and 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. Also see Natural gas. American Society for Testing and Materials at wt: The abbreviation for atomic weight. Atmospheric crude oil distillation: The refining process of separating crude oil components at atmospheric pressure by heating to temperatures of about degrees to degrees Fahrenheit depending on the nature of the crude oil and desired products and subsequent condensing of the fractions by cooling. A surface mine in which the coal bed is removed by means of a large diameter drill. Usually operated only when the overburden becomes too thick for

economical strip mining. Authorized cash distribution to municipality: The authorized cash distributions to the municipality from the earned surplus of the utility department. Automatic set-back or clock thermostat: Automobile and truck classifications: Vehicle classifications for automobiles and light duty trucks were obtained from the EPA Environmental Protection Agency mileage guide book. Almost every year there are small changes in the classifications, therefore the categories will change accordingly. The EPA mileage guide can be found at any new car dealership. A generator at the electric plant site that provides power for the operation of the electrical generating equipment itself, including related demands such as plant lighting, during periods when the electric plant is not operating and power is unavailable from the grid. A black start generator used to start main central station generators is considered to be an auxiliary generator. Available but not needed capability: Net capability of main generating units that are operable but not considered necessary to carry load and cannot be connected to load within 30 minutes. Average Annual Percent Change Coal: The ratio of the total production at a mining operation to the total number of production days worked at the operation. The weighted average of all contract price commitments and market price settlements in a delivery year. Average household energy expenditures: A ratio estimate defined as the total household energy expenditures divided by the total number of households.

Chapter 3 : Energy Glossary

activation energy, energy of activation - the energy that an atomic system must acquire before a process (such as an emission or reaction) can occur; "catalysts are said to reduce the energy of activation during the transition phase of a reaction".

A vehicle designed to operate on an alternative fuel e. Alternative fuel vehicle converter: An organization including companies, government agencies and utilities , or individual that performs conversions involving alternative alternative fuel vehicles. Alternative-rate DSM program assistance: These rates are intended to reduce consumer bills and shift hours of operation of equipment from on-peak to off-peak periods through the application of time-differentiated rates. For example, utilities often pay consumers several dollars a month refund on their monthly electric bill for participation in a load control program. Advanced Metering Infrastructure is a term denoting electricity meters that measure and record usage data at a minimum, in hourly intervals, and provide usage data to both consumers and energy companies at least once daily. An alloy of silica and hydrogen, with a disordered, noncrystalline internal atomic arrangement, that can be deposited in thin-film layers a few micrometers in thickness by a number of deposition methods to produce thin-film photovoltaic cells on glass, metal, or plastic substrates. The depreciation, depletion, or charge-off to expense of intangible and tangible assets over a period of time. In the extractive industries, the term is most frequently applied to mean either 1 the periodic charge-off to expense of the costs associated with nonproducing mineral properties incurred prior to the time when they are developed and entered into production or 2 the systematic charge-off to expense of those costs of productive mineral properties including tangible and intangible costs of prospecting, acquisition, exploration, and development that had been initially capitalized or deferred prior to the time the properties entered into production, and thereafter are charged off as minerals are produced. The unit of measurement of electrical current produced in a circuit by 1 volt acting through a resistance of 1 Ohm. Automated Meter Reading is a term denoting electricity meters that collect data for billing purposes only and transmit this data one way, usually from the customer to the distribution utility. Services that ensure reliability and support the transmission of electricity from generation sites to customer loads. Such services may include: The annual fuel consumption divided by the product of design firing rate and hours of operation per year. 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. This fuel typically has a heat content of 15 million Btu per ton or less. 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. The American Petroleum Institute, a trade association. American Petroleum Institute measure of specific gravity of crude oil or condensate in degrees. An arbitrary scale expressing the gravity or density of liquid petroleum products. The measuring scale is calibrated in terms of degrees API; it is calculated as follows: Coal production plus imports of coal, coke, and briquets minus exports of coal, coke, and briquets plus or minus stock changes. The sum of "Production" and "Imports" less "Exports" may not equal "Consumption" due to changes in stocks, losses, unaccounted-for coal, and special arrangements such as the United States shipments of anthracite to United States Armed Forces in Europe. Apparent consumption, natural gas international: Apparent consumption, petroleum international: Consumption that includes internal consumption, refinery fuel and loss, and bunkering. For countries in the Organization for Economic Cooperation and Development OECD , apparent consumption is derived from refined product output plus refined product imports minus refined product exports plus refined product stock changes plus other oil consumption such as direct use of crude oil. For countries outside the OECD, apparent consumption is either a reported figure or is derived from refined product output plus refined product imports minus refined product

exports, with stock levels assumed to remain the same. Apparent consumption also includes, where available, liquefied petroleum gases sold directly from natural gas processing plants for fuel or chemical uses. The product of the voltage in volts and the current in amperes. It comprises both active and reactive power. A piece of equipment, commonly powered by electricity, used to perform a particular energy-driven function. 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. A relative comparison of trends in new-model efficiencies for major appliances and energy-using equipment. Efficiencies for each year were efficiencies of different model types that were weighted by their market shares. 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Environmental Protection Agency EPA Asbestos treatment methods include removal, encapsulation or sealing, and enclosure behind a permanent barrier. These methods needed to be created because of the well documented health problems caused by Asbestos fibers. Those interested should read some articles about Mesothelioma. Impurities consisting of silica, iron, alumina, and other noncombustible matter that are contained in coal. Ash increases the weight of coal, adds to the cost of handling, and can affect its burning characteristics. Ash content is measured as a percent by weight of coal on an "as received" or a "dry" moisture-free, usually part of a laboratory analysis basis. A dark brown-to-black cement-like material obtained by petroleum processing and containing bitumens as the predominant component; used primarily for road construction. It includes crude asphalt as well as the following finished products: The conversion factor for asphalt is 5. Coal in the condition as received by the user. As-received condition or as-received basis coal: Coal in the condition as received by the consumer or the laboratory analyzing the coal. A unique string of alphanumeric characters that identifies an assembly, bundle, or canister for a specific reactor in which it has been irradiated. Each assembly is characterized by a fabricator, rod-array size, and model type. An eight-digit assembly type code is assigned to each assembly type based on certain distinguishing characteristics, such as the number of rods per assembly, fuel rod diameter, cladding type, materials used in fabrication, and other design features. The annual or biennial work performed on a mining claim or claims , after claim location and before patent, to benefit or develop the claim and to protect it from relocation by third parties. Assistance for heating in winter: Assistance for weatherization of residence: The household received services free, or at a reduced cost, from the Federal, State, or local Government. Any of the following services could have been received: Natural gas that occurs in crude oil reservoirs either as free gas associated or as gas in solution with crude oil dissolved gas. Also see Natural gas. See associated-dissolved natural gas above and Natural gas. The acronym for the American Society for Testing and Materials. Atmospheric crude oil distillation: The refining process of separating crude oil components at atmospheric pressure by heating to temperatures of about degrees to degrees Fahrenheit depending on the nature of the crude oil and desired products and subsequent condensing of the fractions by cooling. The abbreviation for atomic weight. A surface mine where coal is recovered through the use of a large-diameter drill driven into a coalbed exposed by surface mining excavations or in natural sloping terrain. It usually follows contour, area, or open-pit surface mining, particularly when the overburden becomes too thick for further economical excavation. Authorized cash distribution to municipality: The authorized cash distributions to the municipality from the earned surplus of the utility department. Automatic set-back or clock thermostat: Automobile and truck classifications: Vehicle classifications for automobiles and light duty trucks were obtained from the EPA Environmental Protection Agency mileage guide book. Almost every year there are

small changes in the classifications, therefore the categories will change accordingly. The EPA mileage guide can be found at any new car dealership. A generator at the electric plant site that provides power for the operation of the electrical generating equipment itself, including related demands such as plant lighting, during periods when the electric plant is not operating and power is unavailable from the grid. A black start generator used to start main central station generators is considered to be an auxiliary generator. Available but not needed capability: Net capability of main generating units that are operable but not considered necessary to carry load and cannot be connected to load within 30 minutes. Average Annual Percent Change Coal: The ratio of the total production at a mining operation to the total number of production days worked at the operation. The weighted average of all contract price commitments and market price settlements in a delivery year. Average household energy expenditures: A ratio estimate defined as the total household energy expenditures divided by the total number of households. The ratio of the total value of the coal produced at the mine to the total production tonnage. Average production per miner per day: The product of the average production per miner per hour at a mining operation and the average length of a production shift at the operation. Average production per miner per hour:

Chapter 4 : What is energy? definition and meaning - calendrierdelascience.com

Written by the editor of The Encyclopedia of Energy, Cutler Cleveland, Dictionary of Energy gives professionals across the multi-disciplinary field of energy a tool to better communicate on energy matters and understand energy issues and opportunities.

Chapter 5 : Energy | Definition of Energy by Merriam-Webster

energy meaning: 1. the power and ability to be physically and mentally active: 2. the total of all your power and ability to be mentally and physically active: 3. the power from something such as electricity or oil that can do work, such as providing light and heat.

Chapter 6 : Glossary - U.S. Energy Information Administration (EIA)

enâ€œerâ€œgy (enâ€œÉ™r jĂ“), USA pronunciation n., pl. -gies.. the capacity for vigorous activity; available power: I eat chocolate to get quick energy. an adequate or abundant amount of such power: I seem to have no energy these days.

Chapter 7 : Energy | Define Energy at calendrierdelascience.com

A generator is a machine that converts mechanical energy into electrical energy. Electrical energy is power from electricity, measured in joules, that makes machines work or produces heat. renewable energy.

Chapter 8 : Conservation Of Energy | Definition of Conservation Of Energy by Merriam-Webster

Energy derived from the Sun's radiation. Passive solar energy can be exploited through architectural design, as by positioning windows to allow sunlight to enter and help heat a space. Active solar energy involves the conversion of sunlight to electrical energy, especially in solar (photovoltaic) cells.

Chapter 9 : Energy - Biology-Online Dictionary | Biology-Online Dictionary

Energy is defined as the capacity of a physical system to perform work. However, it's important to keep in mind that just because energy exists, that doesn't mean it's necessarily available to do work. Other forms of energy may include geothermal energy and classification of energy as renewable or.