

Forms of Energy

Form of Energy	Description	Examples/Illustration
Mechanical	The total energy of motion and position. Mechanical $E = PE + KE$	The flow of water through a turbine. The swinging of a pendulum. The falling of a rock. The Spinning of a windmill. The movement of air in wind.
Thermal	The kinetic energy in the particles of matter. Increase thermal energy = increase molecular motion	Add heat to ice, molecules move faster and melt to water. Add heat to water, molecules move faster and evaporate to water vapor.
Chemical	A form of potential energy. Energy is stored in the bonds of a molecule. When the bonds break to form a new molecule, energy is released.	Chemical energy is in glucose, gasoline, firewood. Anything that can burn has chemical energy.
Electrical	The energy of moving electrons. A magnet rotating in a coil of wire can cause electrons to start to flow and move along the wire.	Anything that is plugged into an outlet or uses batteries is using electrical energy.
Sound	The energy in vibrating particles. Sound must have a medium through which to travel because particles get compressed in waves.	Any disturbance that causes particles to vibrate produces sound: guitar strings, voice, clapping hands.
Light	Produced by the vibrations of electrically charged particles. Does not require a medium through which to travel. This is why light can get to us from the sun.	Electromagnetic spectrum: Visible light, infrared light, ultraviolet light. Wavelengths of light can be separated through a prism.
Nuclear	Energy produced when the nucleus of an atom splits (fission) or when two nuclei combine (fusion).	Fusion of two hydrogen atoms to form helium (on the sun). Fission of Uranium atom in a nuclear power plant.

Energy Resources

Energy Resource	Description	Advantages	Disadvantages
Coal	Non-renewable fossil fuel in the solid state. Mostly burned for producing electricity.	Easy to get and transport. Provides much energy. Dependable.	Nonrenewable. Produces smog and acid rain. Contributes to global warming. (CO ₂)
Petroleum	Non-renewable fossil fuel in the liquid state. Must be refined to get gasoline, tar, etc.	Easy to get and transport. Provides many products! (petrochemicals)	Nonrenewable. Contributes to acid rain and global warming. Risk of oil spills.
Natural Gas	Non-renewable fossil fuel in the gas state. Mostly used for heating homes, cooking.	Easy to transport and use. Provides much energy. Dependable. Cleanest fossil fuel.	Nonrenewable. Contributes to global warming. Lowest supply of fossil fuels.
Nuclear	Fission of Uranium in a reactor produces much heat to turn water to steam for electricity.	Small amount of Uranium produces much energy. No smog or CO ₂ emissions.	Nonrenewable. Expensive. Produces radioactive waste and thermal pollution.
Solar	Sunlight converted into electric energy in photovoltaic cell. Or Sunlight into heat.	The sun is a limitless source. No pollution or CO ₂ emissions.	Only useful in parts of the world with much sun. Expensive for large-scale energy use.
Water	A dam is built to back up water behind it. Water flows through spinning a turbine.	Renewable. Does not produce pollution. Dependable where rain is plentiful.	Only useful in areas with much rainfall and bodies of water. Disrupts wildlife.
Wind	Mechanical energy of wind spins turbine to generate electricity.	Renewable. Fairly inexpensive. Does not produce pollution or CO ₂ .	Only practical in windy areas.
Geothermal	Pumps water underground into hot rock so that it can turn to steam to spin turbine	Renewable. Power plants require little land.	Only practical in locations near hot spots. Waste water can damage soil. Expensive.
Biomass	Organic matter can be burned for energy. Plant material can ferment to form alcohol to burn for fuel. (Ethanol)	Renewable	Requires large areas of farmland to produce. Produces smoke when burned and some CO ₂ .