

What is Energy?



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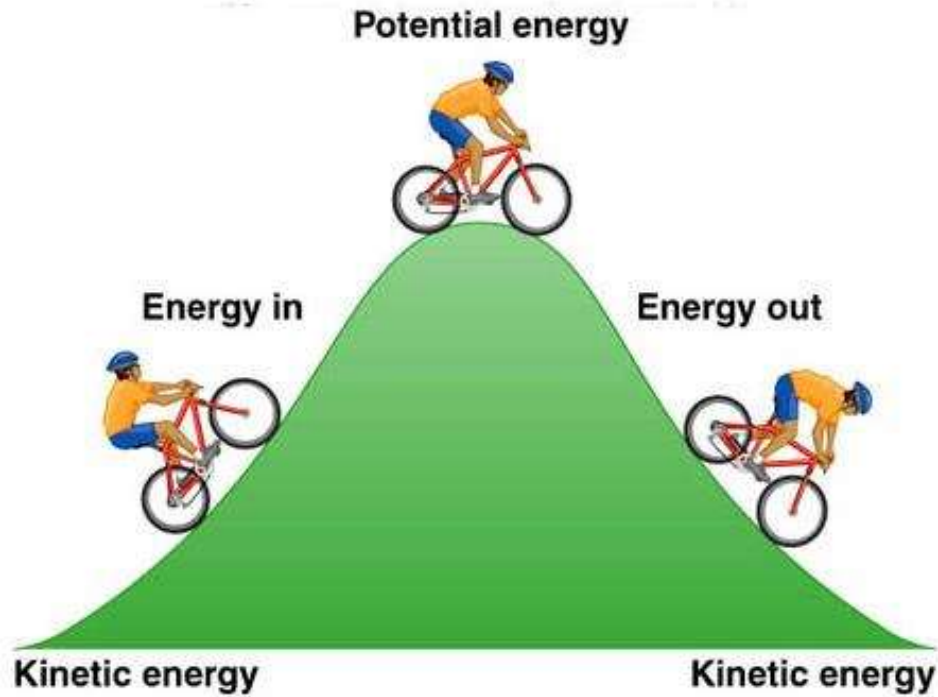
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What is Energy?

- Energy is the ability to perform work.
- Energy is a part of all things in the world and activities we do.

Energy is everywhere!

Forms of Energy



Forms of Energy

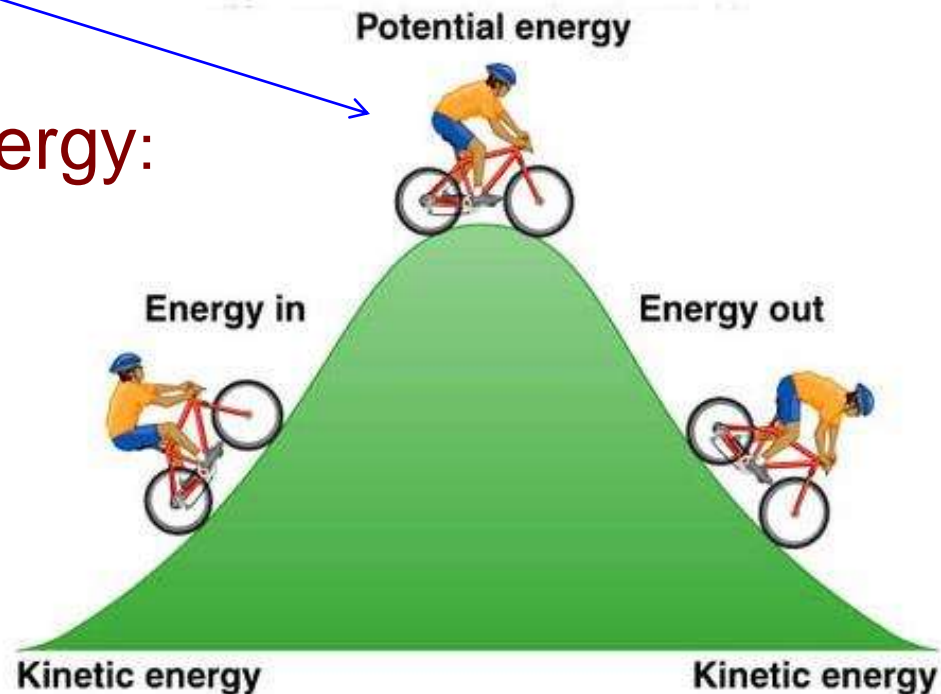
- Potential Energy
 - Stored energy as a result from the objects position, size and shape.
 - Forms of Potential Energy
 - Gravitational energy, chemical energy, nuclear energy and stored mechanical energy.

Forms of Energy

- Potential Energy

Examples of Potential Energy:

1. A charged battery
2. A car at the top of a hill
3. A stretched rubber band



Forms of Energy

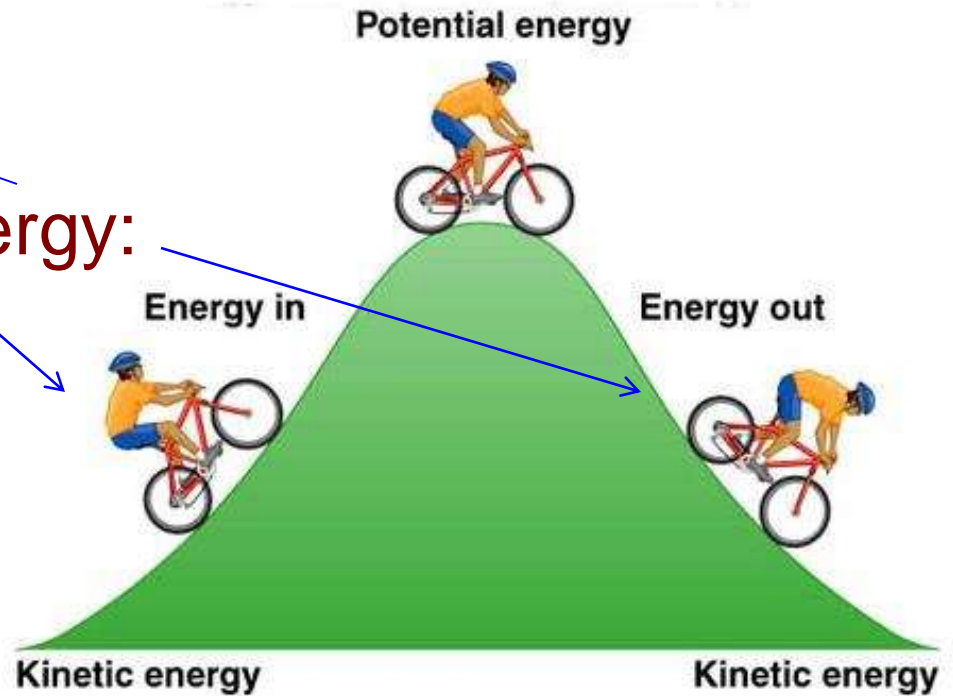
- Kinetic Energy
 - Energy from an objects movement (motion) – *motion from waves, electrons, atoms, molecules and substances.*
 - Forms of Kinetic Energy
 - Radiant energy, thermal energy, motion, sound and electrical energy.

Forms of Energy

- Kinetic Energy

Examples of Kinetic Energy:

1. A falling object
2. A running child
3. Heat



Forms of Energy

Elastic Energy

- Stored by stretching solid objects



Images.wisegeek.com

Chemical Energy

- Released when a fuel burns



Res.cloudinary.com

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Forms of Energy

Radiant Energy

- Carried by light



4.bp.blogspot.com

Thermal Energy

- Due to an objects temperature



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Non-Renewable and Renewable Energy



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What is Non-Renewable Energy?

Crude Oil (Petroleum), Natural Gas, Coal, Uranium

- Non-Renewable Energy are resources found in the Earth that have finite amount. The processes that created these resources took millions of years to produce.
- Non-Renewable Energy has a limited supply of resources available to maintain human consumption.

Non-Renewable Energy

Fossil Fuels

A mixture of hydrocarbons that formed from plants and animals that lived millions of years ago.

- Crude oil
 - Used to make petroleum products such as; gasoline, heating oil, plastics and nearly everything we use.
- Natural gas
 - Used for heating, electricity and cooking, vehicle fuel and the manufacturing of plastics.

Non-Renewable Energy

Fossil Fuels

A mixture of hydrocarbons that formed from plants and animals that lived millions of years ago.

- Coal
 - Used to make electricity, liquid fuel, cement and steel production. Also used for generating power.
- Uranium
 - Not a fossil fuel, but is a non-renewable energy source.
 - Used for the electricity production through nuclear fission (atom bond breaking).

Non-Renewable Energy

Fossil fuels

Burning fossil fuels for human consumption releases enormous amounts of greenhouse gases such as, carbon dioxide (CO₂) and Methane, into our atmosphere.

The increase CO₂ values contribute to climate change, ocean acidification, air pollution and acid rain.

What is Renewable Energy?

Solar, Wind, Biofuels, Biomass, Geothermal, Hydropower

- Renewable Energy has an energy source that can easily be replenished.
- These resources are produced by nature and are less likely to run out.

The logo for New Mexico State University, featuring the letters "NM" stacked above "STATE" in a white serif font, enclosed within a white outline of the state of New Mexico. The logo is set against a dark maroon background.

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Renewable Energy

Sunlight – Solar Energy



mediad.publicbroadcasting.net

Wind Energy



econews.com.au

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Renewable Energy

Sunlight – Solar Energy

- Solar Energy is used to generate electricity.
- Sunlight directly converted into electricity is called a solar cell or *Photovoltaic cell (PV)*.

Wind Energy

- Wind turbines convert Kinetic Energy into mechanical power used for electricity.

Renewable Energy

Sunlight – Solar Energy

- PROS
 - The Sun creates thermal and radiant energy
- CONS
 - The cost is somewhat high and not all localities have abundant sunlight globally.

Wind Energy

- PROS
 - Produces clean energy
- CONS
 - Endangers migratory birds and bats.
 - Not aesthetic
 - Noise pollution
 - Restricted to geographically windy locations

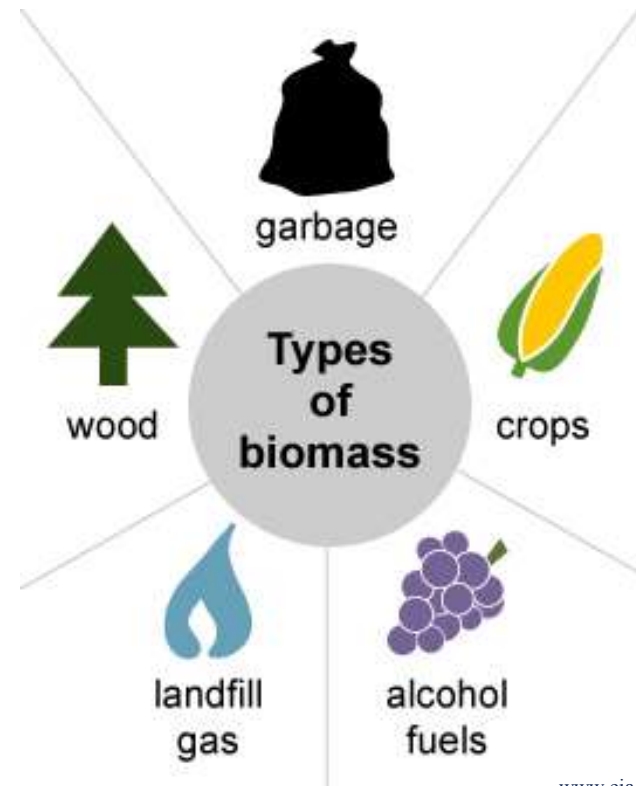
Renewable Energy

Biofuel



qpb.website

Biomass



www.eia.gov

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Renewable Energy

Biofuels

- Ethanol and biodiesel used as transportation fuel derived from *biomass*.

Biomass

- Plants like soybeans and corn are grown for the purpose of burning for the production of energy, such as fuel for automobiles, electricity and heat.
- Captured landfill gas

Renewable Energy

Biofuels

- PROS
 - Biomass needed for Biofuel can be replanted.
- CONS
 - Biomass is burned, emitting CO₂ into the atmosphere.

Biomass

- PROS
 - Plants such as corn and soybean can be replanted for use.
- CONS
 - The clearing of land causes destruction of natural ecosystems for the development of fields and tree farms.

Renewable Energy

Hydropower

Geothermal



www2.emersonprocess.com

www.american-analytical.com

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Renewable Energy

Water – Hydropower

- Moving water generates mechanical power that is used for electricity production.
- This conversion takes place at hydroelectric power plants near water sources.

Geothermal

- Heat taken from the Earth to produce heat and electricity for homes and buildings.

Renewable Energy

Water – Hydropower

- PROS
 - Clean and renewable source of energy
- CONS
 - Turbine blades of hydropower plants kill many migratory fish.

Geothermal

- PROS
 - Clean and renewable source of energy
- CONS
 - Geographically limited to areas where magma sources are closer to Earth's surface.

Perfect Solution?

- There is no perfect solution to the hazards caused by energy production.
- The best we can do is find a good balance of renewable energy sources.
- Get creative! Continue the science to address negative impacts from energy use.