

- **What is Energy?**

energy is defined as the ability of a system to cause external action

Forms of energy: mechanical energy (i.e. potential or kinetic energy), thermal, electric and chemical energy, nuclear energy and solar energy

- The ability to perform work becomes *visible* by force, heat and light
- The ability to perform work from chemical energy, nuclear and solar energy is only given if these forms of energy are transformed into mechanical and/or thermal energy

- **Energy resources are generally distinguished:**

- Fossil energy resources are stocks of energy that have formed during ancient geologic ages by biologic and/or geologic processes.
 - fossil biogenous energy resources (i.e. stocks of energy carrier of biological origin) E.g: hard coal, natural gas, crude oil deposits-fossil mineral energy resources (i.e. stocks of energy carrier of mineral origin or non-biological origin) E.g: energy contents of uranium deposits and resources to be used for nuclear fusion processes.
- Recent resources are energy resources that are currently generated, for instance, by biological processes; E.g: the energy contents of biomass and the potential energy of a natural reservoir.

The term of **Renewable energy** refers to primary energies that are regarded as inexhaustible in terms of human (time) dimensions.

- **Characteristics:**

- They are continuously generated by the energy sources solar energy, geothermal energy and tidal energy.
- The energy produced within the sun is responsible for a multitude of other renewable energies (such as wind and hydropower) as well as renewable energy carriers (such as solid or liquid biofuels).
- The energy content of the waste can only be referred to as renewable if it is of non-fossil origin (e.g. organic domestic waste, waste from the food processing industry).

Properly speaking, only naturally available primary energies or primary energy carriers are renewable but not the resulting secondary or final

energies or the related energy carriers.

However, in everyday speech secondary and final energy carriers derived from renewable energy are often also referred to as renewable.

- **Applications of renewable energies...**

The energy flows available on earth that directly or indirectly result from these renewable energy sources vary tremendously, for instance, in terms of energy density or with regard to spatial and time variations.

