

Wind power/Solar power

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Solar energy



It is split up into two types, thermal and electric energy. These two subgroups mean that they heat up homes and generate electricity.

Solar energy is the radiant light and heat from the Sun. Solar radiation along with secondary solar resources such as wind and wave power, hydroelectricity and biomass account for most of the available renewable energy on Earth. Only a minuscule fraction of the available solar energy is used.

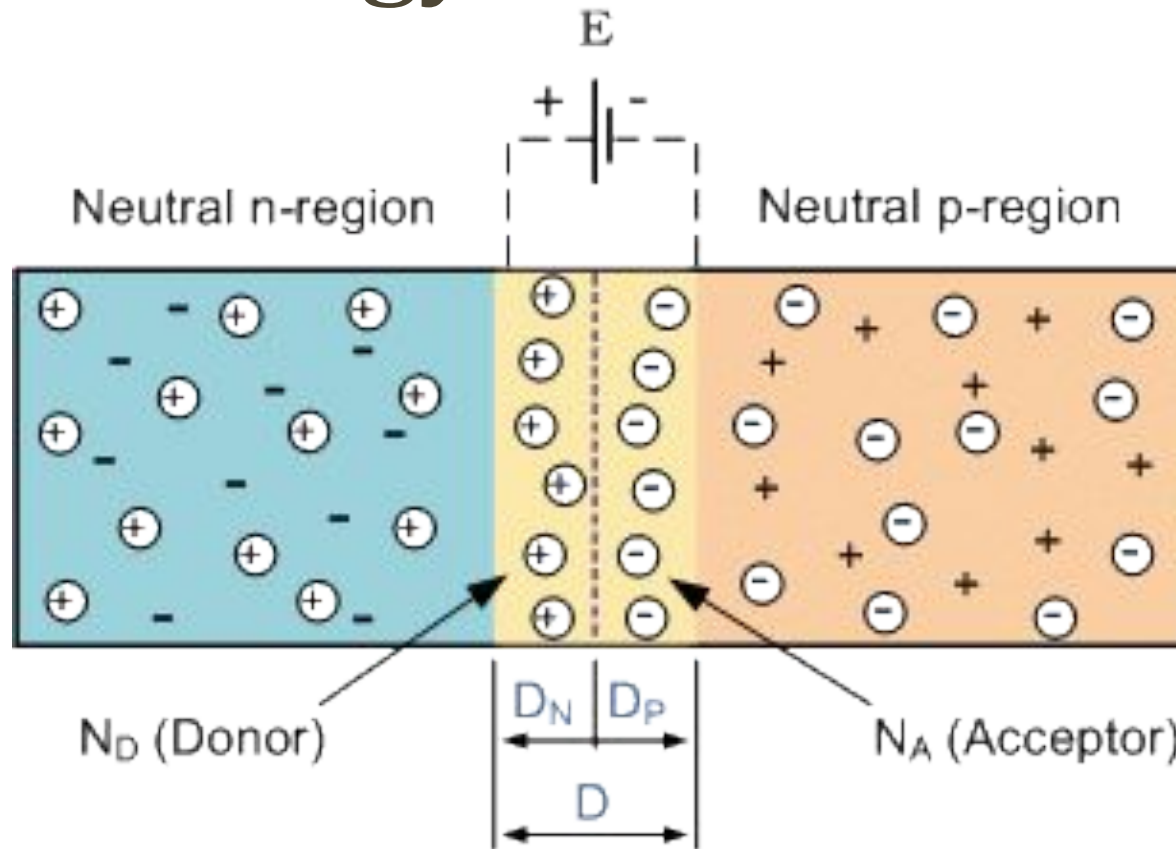
Solar energy



- About half the incoming solar energy reaches the Earth's surface.
- The Earth receives 174 petawatts (PW) of incoming solar radiation (insolation) at the upper atmosphere.
- Approximately 30% is reflected back to space while the rest is absorbed by clouds, oceans and land masses.
- The spectrum of solar light at the Earth's surface is mostly spread across the visible and near-infrared ranges with a small part in the near-ultraviolet.

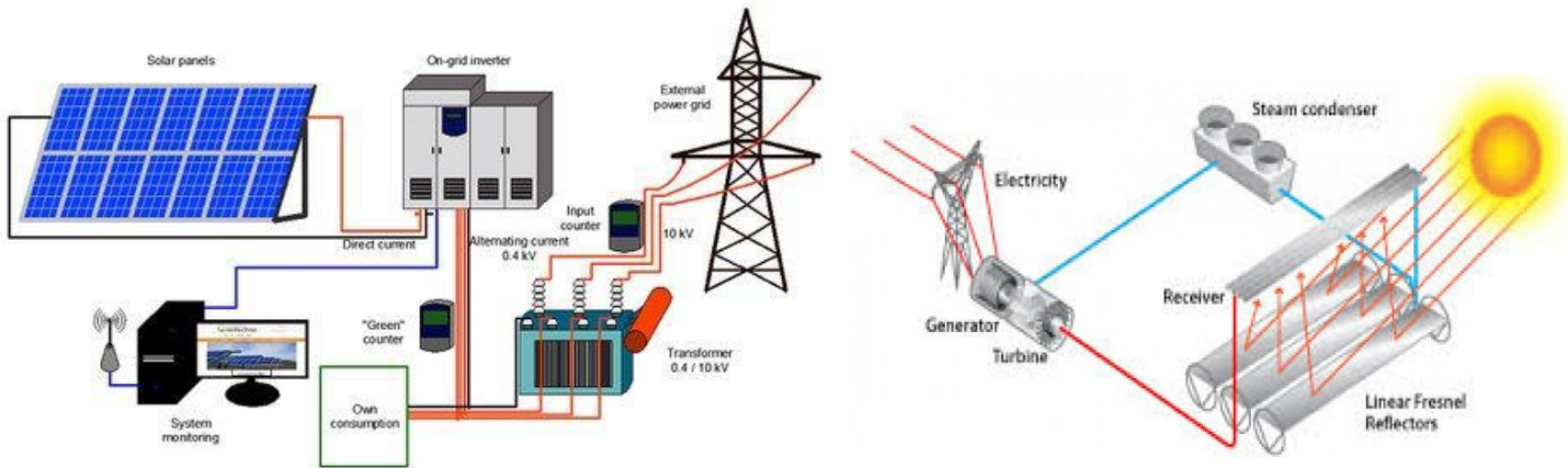
Earth's land surface, oceans and atmosphere absorb solar radiation, and this raises their temperature. Warm air containing evaporated water from the oceans rises, causing atmospheric circulation or convection. When the air reaches a high altitude, where the temperature is low, water vapor condenses into clouds, which rain onto the Earth's surface, completing the water cycle.

Solar energy



Solar photovoltaics turn sunlight directly into electric current. The cells that make up solar panels are composed of semiconductor materials that are sandwiched together and specially treated so one layer has an excess of electrons, while the other has an excess of "holes" that electrons can occupy.

Solar energy



The most common type of heat engine used in dish/engine systems is the [Stirling engine](#). Heated fluid from the dishes receiver is used to move pistons in the engine to create mechanical power.

This mechanical power then runs to a generator or alternator to generate electricity.

Solar dish/engine systems always point straight at the sun and concentrate the solar energy at the focal point of the dish. A solar dish's concentration ratio is much higher than linear concentrating systems, and it has a working fluid temperature higher than **749 degrees Celsius**.

Wind Power

Wind energy is the generation of electricity from the wind.



The most common kind of wind turbine has a horizontal axis and looks like a giant propeller, although some turbines have a vertical axis and look a little like eggbeaters. Small wind turbines provide up to 100 kilowatts, enough to sustain homes or store energy by recharging batteries; these are sometimes used in remote off-the-grid locations.

Wind Power

Wind farms consist of many individual wind turbines, which are connected to the electric power transmission network. Onshore wind is an inexpensive source of electric power, competitive with or in many places cheaper than coal or gas plants. Onshore wind farms also have an impact on the landscape, as typically they need to be spread over more land than other power stations and need to be built in wild and rural areas, which can lead to "industrialization of the countryside" and habitat loss. Offshore wind is steadier and stronger than on land and offshore farms have less visual impact, but construction and maintenance costs are higher. Small onshore wind farms can feed some energy into the grid or provide electric power to isolated off-grid locations.

