

Resource Activity 1

Teaser: Let's discuss renewable energy and the three main technologies, which generate the biggest share of renewable energy.

Renewable energy

Renewable energy includes:

HYDROPOWER – extracting kinetic or potential energy of water, usually using dams and turbines. Since ancient times, waterwheels have been used for irrigation and for operating mechanical devices (e.g. sawmills). In modern times, hydropower is almost exclusively concerned with hydroelectric power, in which the water passes through a turbine, the rotation of which is used to drive a generator and produce electricity. Hydropower has a significant share in electricity production – the largest of all renewable energy technologies.



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SOLAR POWER – harvesting energy from the sunlight, usually using solar cells, arranged in solar panels. Here, the energy transformation involves a photon that is used to extract free electrons from a semiconducting material and use those electrons for electricity. Semiconducting material is a material that allows exactly for this effect to take place, namely semiconductors eject electrons when exposed to sunlight, but do not conduct electricity in the darkness. We call this a photoelectric effect, firstly discovered by Edmund Becquerel in 1839.



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WIND. Here, the fluid is air which rotates a specially designed wind-turbine with blades shaped as aerofoils. The most common configuration is a horizontal axis wind turbine (HAWT), though some vertical axis systems exist. Industrial-sized wind turbines are designed to produce 2 MW power (sufficient to provide electricity to about 1200 houses). They weigh 22 tonnes, are 80-90 m high, and have three white blades to be noticeable from the air. These turbines are about 50 times more powerful than turbines that were produced 20 years ago.



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