

RENEWABLE ENERGY

There are many forms of renewable energy. Most of these renewable energy depend in one way or another on sunlight. Wind and hydroelectric power are the direct result of differential heating of the Earth's surface which leads to air moving about – wind and precipitation forming as the air is lifted. Solar energy is the direct conversion of sunlight using panels or collectors. Biomass energy is stored sunlight contained in plants. Other renewable energies that do not depend on sunlight are geothermal energy, which is a result of radioactive decay in the crust combined with the original heat of accretion of the Earth and tidal energy, which is a conversion of gravitational energy.



Figure 1: renewable energy.

<http://www.investmauritius.com/investment-opportunities/energy.aspx>

As we know, world is converting to electric mobility not only because we want to eliminate vehicle pollution but also because society wants to decrease pollution at energy production.

Let's look at the two different terms of energy sources.

Renewable energy is energy that is generated from natural processes that are continuously replenished. This kind of energy cannot be exhausted and is constantly renewed.

Alternative energy is an energy source that is an alternative to fossil fuels. These are energies that have low environmental impact. This is the key distinction which separates it from renewable energy which may or may not have significant environmental impact.

Now we will go over various renewable energy sources that are used to generate fuel for electric vehicles.



Figure 2: wind energy.
http://www.conserve-energy-future.com/disadvantages_windenergy.php

Wind Power. The atmosphere is moved by differences of temperature at the Earth's surface caused by the sunlight. Generating significant amount of energy requires extensive areal coverage.

Solar. Collecting and converting Sun's power can be done in few different ways. This ranges from solar water heating with solar collectors or cooling with solar attic fans to direct conversion of sunlight to electrical energy with photovoltaic cells.



Figure 3: hydro energy.
<http://www.a2energies.com/energy.php?keyword=Hydro%20Energy>

Hydroelectric energy. This form abuses gravitational forces of elevated water that flows through turbines that generate electrical power. Most of the locations with potential are already used in modernised world.



Figure 4: biomass energy.
http://www.renewableenergyworld.com/articles/2015/10/biomass-energy-potential-far-from-being-fully-exploited-in-china.html?utm_source=twitterfeed&utm_medium=twitter

Biomass. This is the energy captured in plants. The most popular is the burning of plant part to generate heat. Unfortunately this process releases large amounts of CO₂ into the atmosphere. Other forms of biomass are methane generation or alcohol generation for automobile fuel or to fuel power plants.



Figure 5: Hydrogen energy
<http://www.morningticker.com/2015/09/scientists-make-huge-hydrogen-energy-discovery/>

Hydrogen energy. This kind of energy falls into alternative energy sources since its broad availability and has very low pollution impact to the environment. Hydrogen can be burned as a fuel producing only water as a side product. Hydrogen can be also used in fuel cells which are very similar to batteries that power an electric motor. Significant energy is used to produce hydrogen. This means that pollution is relocated from cities to the factories that produce hydrogen.



Figure 6: Geothermal energy
<http://science.howstuffworks.com/environmental/energy/geothermal-energy.htm>

Geothermal power. This type of energy is left from the planet creation and is augmented by heat from radioactive decay. This possibility is limited only to a few locations. Another form of geothermal energy is heat stored in Earth's surface since it tends to stay at quite constant temperature. Difference can be used with heat pumps to heat buildings in winter or to cool them during the summer.

Other forms of energy. This includes energy from tidal waves or hot hydrogen fusion, both can be used to generate electric power. Such alternatives are not reliable to solve our energy problems.

Countries in modernised world are passing bills and legislations to slowly increase energy derived from renewable energy sources. Goal is to obtain 100% energy from renewable energy sources.