The Compact Guide to Renewable Energy

Renewable energy is energy (e.g. electricity) which comes from sustainable sources and is naturally replenished.

These renewable energy sources conform to the high electricity demands of the world and have little negative effects to the world we live in. In fact, they contribute little to no pollution and do not poison the earth's atmosphere.

Here are the various types of renewable energy:

Hydro-electric renewable energy

Hydropower uses flowing water (passing through a turbine which activates a generator) to create energy. It is very popular around the world as rainfall makes it easy to gather large amounts of water and produce electricity.

Hydro power accounts for 20% of the world's electricity and is the most favoured form of renewable energy, at a staggering 90% of the world's renewable output.

Dams are efficient, relatively cheap and easy to build. Hydro power usually takes place in the form of a dam, but smaller scale water mill houses are also used.

Advantages

- Clean source of energy with minimal amounts of carbon produced during generation
- Cheap and easy to maintain
- No pollutants associated with hydropower
- Corresponds to energy demand, i.e. hydropower produces the most amount of energy in winter which is when the highest amount of energy is needed

Disadvantages

- Hydropower dam's come at a large social and environmental cost. Often, people are displaced to build the dam and lake. Wildlife and entire ecosystems are disrupted due to dams
- Some countries such as the UK don't have the facilities and scope for large scale hydropower

Wind Renewable energy

Harnessing the power of wind is a very effective way to create energy. Wind turbines are used all over the world to create a renewable source of energy.

Wind turbines use large blades to catch the wind and turn the rotor, ultimately this spins the turning shaft and the generator creates electricity.

Wind power is accessible to countries all over the world. The towering turbines are used both onshore and offshore, however, offshore turbines provide larger amounts of energy as there's more powerful and greater supply of wind offshore.

Advantages

- Wind is readily available in many areas
- No pollutants associated with wind power
- Simple technology
- Cheap and easy to maintain
- Gives landowners, such as farmers, a secondary source of income while continuing to use the land as before

Disadvantages

- Offshore wind farms are expensive (one of the most expensive forms of generating electricity per unit)
- Only produces energy when windy
- Can impact wildlife (e.g. may affect migratory patterns of birds, and birds fly into them and are killed (although a vastly smaller number than bird deaths from buildings) – this can be overcome with paint).

Solar renewable energy

Solar energy (also known as photovoltaic energy) uses solar cells which turn sunlight into electricity.

Although photovoltaic energy is a complicated technology, it has been cleverly adapted into compact panels, allowing homeowners and businesses to turn their roofs into energy generators.

Solar renewable energy has become popular all over the world, particularly in southern Europe.

Advantages

- Highly effective technology in sunny areas of the world
- Easy to run and maintain
- Solar energy can be applied in a variety of ways

Disadvantages

- Upfront cost can be high

Biomass renewable energy

Biomass, or bioenergy, is the energy produced from organic and plant matter, such as wood, agricultural waste and residue, vegetation and even industrial waste.

The organic matter is incinerated which then produces steam to turn a turbine which generates electricity.

Most biomass is grown specifically to burn and generate electricity. Once the organic matter has been incinerated, the organic matter is replanted in order to keep the method sustainable and also to absorb the carbon which the organic matter releases during combustion.

Advantages

- Huge range of waste can be incinerated to generate electricity, including many that would normally have a high cost
- Produces ash as a by-product and is a rich fertiliser.

Disadvantages

- Needs to be properly managed – sometimes more trees are burned than planted to reduce costs, contributing to deforestation.

Anaerobic digestion renewable energy

Anaerobic digestion involves placing large amounts of manure, vegetation and dead organic matter in silos. Electricity is then produced due to the organic matter decomposing.

The organic matter usually involves matter and many more. Bacteria is added and the oxygen is removed. This produces methane when the organic matter breaks down. The methane is then burned, which drives the turbines and creates electricity.

It is a very common method of creating renewable energy in the United States as waste is plentiful as well as land space, as the silos require a considerable amount of space.

Advantages

- Extremely efficient way of gathering methane
- Puts methane to good use instead of it becoming a greenhouse gas
- Produces valuable fertiliser

Disadvantages

- Expensive up-front cost
- The breakdown of the resources can be slow in cold conditions

What about nuclear power – is it renewable? Some say yes; however uranium, the most common fuel for nuclear reactors, is not classified as renewable.

Geothermal energy – using the heat from deep in the Earth to generate electricity - is also strictly speaking not renewable as we cannot re-create it.

Can you think of any more renewable energy sources? Do you think renewable energy can ever compete with fossil fuels? Please let us know in the comments below.

This blog was written by Jennifer Smith on behalf of Enviko, the renewable energy specialists. It was published on EcoFriendlyLink – your link to everything green and eco-friendly