

Project content:-

What is Renewable Energy?

Renewable energy comes from natural sources that are replenished faster than around us.

In contrast, fossil fuels like coal, oil, and gas are non-renewable resources. They take millions of years to form, and burning them releases harmful greenhouse gases, such as carbon dioxide, which contribute to climate change.

Generating energy from renewable sources produces far fewer emissions than fossil fuels. Switching from fossil fuels to renewables is essential to tackling the climate crisis.

we use them. For example, sunlight and wind are always available and are

constantly renewing. These sources of energy are abundant and can be found all

Renewable energy is now more affordable in most countries and creates three times more jobs than fossil fuel industries.

Types of renewable energy

What is a renewable energy source?

A renewable energy source means energy that is sustainable - something that can't run out, or is endless, like the sun. When you hear the term 'alternative energy' it's usually referring to renewable energy sources too. It means sources of energy that are alternative to the most commonly used non-sustainable sources - like coal.

What is zero-carbon or low-carbon energy?

Nuclear-generated electricity isn't renewable but it's zero-carbon(1), which means its generation emits low levels or almost no CO₂, just like renewable energy sources. Nuclear energy has a stable source, which means it's not dependent on the weather and will play a big part in getting Britain to net zero status.

The most popular renewable energy sources currently are:

- Solar energy
- Wind energy
- Hydro energy
- Tidal energy
- Biomass energy

How these types of renewable energy work

Solar energy:-



Sunlight is one of our planet's most abundant and freely available energy resources. The amount of solar energy that reaches the earth's surface in one hour is more than the planet's total energy requirements for a whole year. Although it sounds like a perfect renewable energy source the amount of solar energy we can use varies according to the time of day and the season of the year as well as geographical location. In the UK, solar energy is an increasingly popular way to supplement your energy usage. Find out if it is right for you by reading our guide to solar power.

Solar energy is the most abundant of all energy resources and can even be harnessed in cloudy weather. The rate at which solar energy is intercepted by the Earth is about 10,000 times greater than the rate at which humankind consumes energy . Solar technologies can deliver heat, cooling, natural lighting, electricity, and fuels for a host of applications.

Wind energy:-



Wind energy harnesses the kinetic energy of moving air by using large wind turbines located on land (onshore) or in sea- or freshwater (offshore). Wind energy has been used for millennia, but onshore and offshore wind energy technologies have evolved over the last few years to maximize the electricity produced - with taller turbines and larger rotor diameters.

Though average wind speeds vary considerably by location, the world's technical potential for wind energy exceeds global electricity production, and ample potential exists in most regions of the world to enable significant wind energy deployment. Many parts of the world have strong wind speeds, but the best locations for generating wind power are sometimes remote ones. Offshore wind power offers tremendous potential.

Hydro energy:-

As a renewable energy resource, hydro power is one of the most commercially developed. By building a dam or barrier, a large reservoir can be used to create a controlled flow of water that will drive a turbine, generating electricity. This energy source can often be more reliable than solar or wind power (especially if it's tidal rather than river) and also allows electricity to be stored for use when demand reaches a peak. Like wind energy, in certain situations hydro can be more viable as a commercial energy source (dependant on type and compared to other sources of energy) but depending very much on the type of property, it can be used for domestic off-grid generation. Find out more by visiting our hydro power page.

Hydropower harnesses the energy of water moving from higher to lower elevations. It can be generated from reservoirs and rivers. Reservoir hydropower plants rely on stored water in a reservoir, while run-of-river hydropower plants harness energy from the available flow of the river.



Tidal energy:-

This is another form of hydro energy that uses twice-daily tidal currents to drive turbine generators. Although tidal flow unlike some other hydroenergy sources isn't constant, it is highly predictable and can therefore compensate for the periods when the tide current is low. Find out more by visiting our marine energy page.



Biomass energy:-



This is the conversion of solid fuel made from plant materials into electricity. Although fundamentally, biomass involves burning organic materials to produce electricity, and nowadays this is a much cleaner, more energy-efficient process. By converting agricultural, industrial and domestic waste into solid, liquid and gas fuel, biomass generates power at a much lower economic and environmental cost.

What isn't a renewable energy source?

A **non-renewable energy source** is one that does not replenish itself quickly enough for sustainable use. Examples include:

- **Fossil Fuels:** These are natural resources like coal, oil, and natural gas that formed over millions of years from the remains of ancient plants and animals. Once used, they cannot be replaced on a human timescale.
- **Nuclear Energy:** While not a fossil fuel, nuclear energy relies on uranium, a mineral resource that is limited. The process of nuclear fission produces a significant amount of energy, but uranium deposits are finite and not renewable.

The future of renewable energy

As world population rises, so does the demand for energy in order to power our homes, businesses and communities. Innovation and expansion of renewable sources of energy is key to maintaining a sustainable level of energy and protect our planet from climate change. Renewable energy sources make up 26% of the world's electricity today, but according to the International Energy Agency (IEA) its share is expected to reach 30% by 2024. "This is a pivotal time for renewable energy, said the IEA's executive director, Fatih Birol. In 2020, the UK hit a new amazing renewable energy milestone. On Wednesday 10th June, the country celebrated two months of running purely on renewable energy for

the first time ever. This is a great step in the right direction for renewables.

Conclusion

In conclusion, renewable energy sources like solar, wind, hydro, and geothermal are essential for a sustainable future. These resources are abundant, constantly replenished, and produce minimal greenhouse gas emissions, making them crucial for combating climate change and reducing pollution.

Investing in renewable energy not only helps protect the environment but also supports economic growth through job creation and energy independence. By transitioning to these clean energy sources, we can create a healthier planet and secure a sustainable energy future for generations to come.

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