

# Solar Energy vs. The Alternatives

Solar energy is power harnessed directly from the sun. Radiant heat and sunlight are captured and converted to generate electrical power. It is a relatively old idea in a new sector with the high potential of taking a leading position over all other energy types, thanks to abundant availability and environmentally-friendly qualities.

While solar energy can be harnessed and converted using various technologies, solar panels are most commonly used. As innovation continues to accelerate, the rate of adoption does as well. Improved storage capacity and technologies allow harnessed energy to be stored and used in off-peak times, such as during inclement weather or at night.

There are multiple benefits of solar energy, including:

- Saves money – cheaper energy leads to a significant reduction in your electricity bills.
- Environmentally safe – the harnessing and storage of solar power does not directly create any pollution or produce any greenhouse gases.
- Renewable and abundant – the sun is readily accessible to most people for most of each day.
- Easy to maintain – solar panels tend to require minimal upkeep while still offering peak performance.

Now, let us take a look into the alternatives to solar energy.

## Wind

Wind turbines harness kinetic energy from the wind's movement to provide power. It is typically used to charge industrial engines, usually used for pumping and milling. Wind power has been understood as far back as 5,000BC — however, the first modern wind turbine was created in Scotland by Professor Blyth James. It is a renewable energy source thanks to its overall abundance and availability.

## Hydroelectricity

With hydroelectricity, electric power is generated from moving water. Mostly located in dams and reservoirs, it harnesses energy by collecting the kinetic energy of gushing water propelling a water turbine. It is not only safe for the environment but is renewable as well. It has been understood since the first century, but the modern turbine

mechanism was created in 18th century France. Today, up to 85% of worldwide electricity is produced from hydroelectric power plants.

## **Bio-fuels**

Bio-fuels generate energy from recycling biomasses such as human and animal wastes, as well as organic materials. This organic matter is broken down and refined to create fuel that can produce energy. Some common examples of biofuels include biodiesel, ethanol, and even bio-jet fuel. If the type of biomass used can quickly regrow, this form of energy can be considered renewable.

## **Nuclear Power**

This form of energy uses nuclear energy to generate heat used to power steam turbines. This energy is produced by various nuclear reactions such as nuclear fission, nuclear, decay, and nuclear fusion. Atomic power stations utilize nuclear reactors that harness the heat from these reactions to power a turbine, which feeds into an electric generator to convert the mechanical energy into electrical energy.

## **Hydrogen Fuel**

Hydrogen fuel is zero-emission fuel burned with oxygen to produce energy. Since pure hydrogen does not occur naturally in vast quantities, it requires an energy input such as methane or electrolysis of water to be produced on an industrial scale. It produces no carbon emissions directly and only leaves water vapor as waste.

## **Tidal Energy**

This renewable form of energy is harnessed from ocean current and sea tides. A tidal generator converts tidal flow into electricity, with more significant tidal variation dramatically increasing the potential for tidal electricity generation. Tides are more predictable than both wind and solar, and rapid advancements in generation are quickly increasing its adoption.

## **Natural Gas**

Natural gas is a gas mixture primarily consisting of methane, but commonly includes varying amounts of other gases such as carbon dioxide, nitrogen, and helium. It is formed due to decomposing organic matter being exposed to intense heat and pressure for millions of years. It is non-renewable and is a greenhouse gas that directly contributes to climate change.

## Geothermal Energy

This form of energy is derived from heat stored within the sub-surface of earth. It is the result of radioactive decay and residual heat loss from the formation of the planet. While sustainable and environmentally friendly, it has been traditionally restricted to areas around tectonic plate boundaries where geothermal activity is most common.

## Wave Power

Wave power is harnessed by capturing the energy of waves to produce electricity. A wave energy converter harnesses the rising and falling movements of the ocean to charge an electricity-generating plant. The amount of power produced depends on wave frequency, height, length, and even water density. It has yet to see widespread adoption due to the potential negative impact on the marine environment, such as noise pollution and current disruption.

## Conclusions

While each form of energy has its own advantages and disadvantages, some forms are more popular than others due to availability and cost. While it does have its drawbacks, solar energy benefits help it stand above all other forms available. Ahead we directly compare solar energy to other popular sources of power.

### Environmental Differences Between Solar Energy And Other Sources

<b>Solar</b>  This type of energy produces minimal risks to the environment.	<b>Hydroelectricity</b>  Poses numerous threats to environmental safety such as; flooding, fluctuating flow patterns, as well as ecosystem and aquatic animal migration disruption.
<b>Solar</b>  No direct waste produced as power is captured directly from the sun.	<b>Nuclear Power</b>  May cause air and water pollution by producing radioactive wastes that are harmful to human and environmental health.
<b>Solar</b>  There is no direct or indirect link to global warming.	<b>Hydrogen Gas</b>  It directly contributes to global warming because of excessive ozone and methane.
<b>Solar</b>	<b>Natural Gas</b>  Requires fossil fuels and emits carbon

No fuels are required and does not emit carbon.	
<b>Solar</b> Does not emit any greenhouse gases.	<b>Geothermal Energy</b> May release greenhouse gases stored in the planet into the atmosphere.