Solar panels facts and information

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Solar energy is a renewable energy source in which it can generate clean and sustainable electricity without producing planet-warming greenhouse gas emission or toxic pollution in the process. As time is ticking before the world crosses the tipping point to limit global temperature increase under 1.5C, switching to renewable energy such as solar is now more crucial than ever. Here are 12 solar energy facts to help make the argument.

While solar energy can be dated all the way back in 700BC, it was not widely commercialised until about 40 years ago and accepted as a clean and effective alternative to fossil fuels. Though developing countries enjoy the advantage of being located in regions where they have optimal access to the sun"s rays, the lack of investment and climate debt means solar energy has been slow to grow in the region. Meanwhile, developed countries such as America, Australia, and more recently, China, have become the leaders in solar power generation.

Solar energy refers to light and heat radiation from the sun that is harnessed to generate electricity. While we scale up technologies across the globe to capture and convert solar energy, the Earth already receives it in spades. An hour and half"s worth of solar energy that reaches to the surface of the planet has enough power to meet all of humanity"s energy consumption for an entire year. Since the sun is not going away anytime soon, we have the ability and technology to depend on solar energy entirely and end the global use and consumption of fossil fuels.

In 2010, solar energy represented only 0.06% of the global energy mix. Within nine years, solar rose up to 1.11%. Solar also makes up the largest proportion of growth in the renewable energy mix, where it grew from 0.8% in 2010 to 10.3% in 2019. Solar power capacity is rapidly growing at the same time, meaning the amount of electricity it can generate from energy it captures. Global solar power rose by 22% in 2020 as installations have experienced a boom. Together with wind power, renewable output has more than doubled since 2015.

While the process of solar power generation does not emit any greenhouse gases, other stages of the life cycle do produce some, but minimal, emissions. This include the manufacture of solar cell and panel materials - primarily made of monocrystalline, polycrystalline, or thin film ("amorphous") silicon– transportation, installation, maintenance, and decommissioning and dismantlement. Most estimates of life-cycle emissions for photovoltaic (PV) solar cell systems are between 0.07 and 0.18 pounds of carbon dioxide equivalent per kilowatt-hour.

Power generation from solar PV in 2020 grew by a record 156 TWh to reach 921 TWh, marking 23% growth from 2019, and accounts for 3.1% of global electricity generation. China, one of the world"s top greenhouse

gas emitters, alone was responsible for 75% of the increase in annual solar PV installations from 2019 to 2020.

Aside from solar PV cell systems, energy can be generated with solar power plants where panels within an infrastructure can last at least 40 years. Panels can be easily replaced and updated with new and more efficient modules at relatively low costs, ensuring a long lifespan of these power plants.

According to the National Renewable Energy Laboratory (NREL), for a solar power plant to provide electricity for 1,000 homes, the facility would require 32 acres of land. In other words, to meet the energy consumption needs of the US, the plant would require 18,734,500 acres to be used for solar plants, which is equivalent to 0.8% of the entire country. Aside from land use, solar thermal power plants require water use and hazardous materials can be dangerous if not disposed of correctly.

One of the most notable solar energy facts is that solar costs will drop significantly within the next few years. Industry experts have predicted that the US will double its solar installations to four million by 2023 while global uptake is projected to soar as more countries turn to solar to help meet their climate goals. In 2021, Australia installed a record more than 3,000MW of rooftop solar panels, where almost one-third of Australian households have solar panels - the highest rate in the world. A positive uptake trend will allow solar costs to drop thanks to its accessibility. Some expect it decline by 15% to 35% by 2024, spurring further growth over the second half of the decade.

According to a 2020 report by the International Renewable Energy Agency (IRENA), solar power is now the cheapest electricity in history. In most major countries, solar technology is also cheaper than coal and gas.

The Noor Complex solar power farm is the world"s largest concentrated solar power (CSP) plant located in the Sahara Desert in Morocco. Its geographical location allows for optimal access to sunlight and is said to have a 580-megawatt capacity and can provide electricity to more than one million people.

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