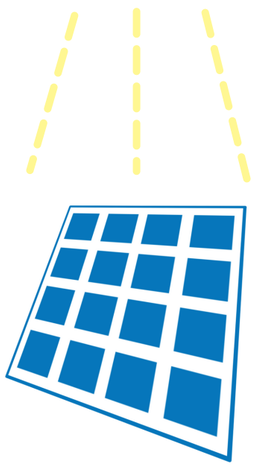
Solar Energy

What Is It?

Solar energy refers to collecting energy from the sun and converting it into electricity. The two primary methods are **photovoltaics** and concentrated/thermal solar.



How Clean Is It?

Solar panels produce no emissions while generating electricity. Mining, building, and installing solar technology generates emissions and requires significant land use.

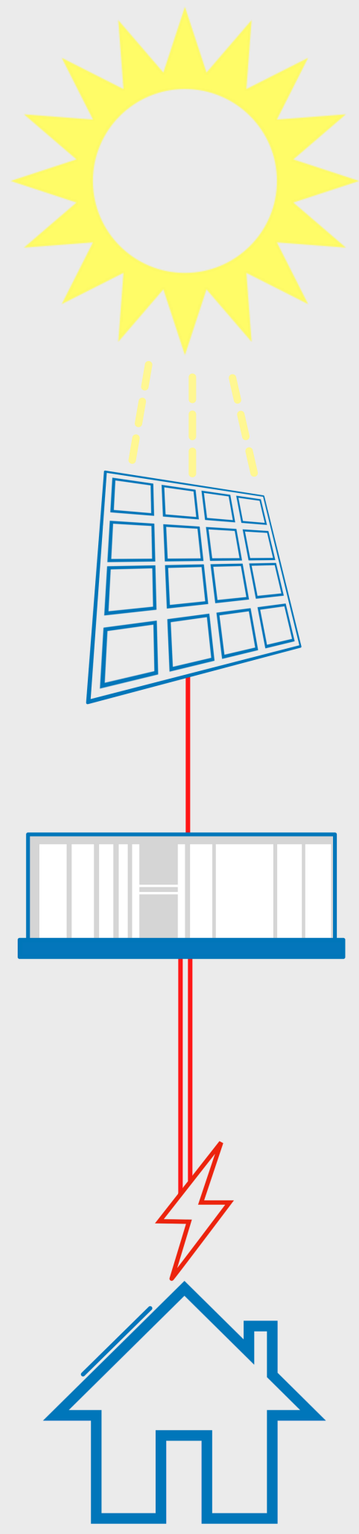
What Does It Cost?

The cost of solar panels varies by efficiency, with rooftop solar being less efficient and cheaper than utility-scale installations.

Space

In the U.S., utility-scale solar power uses half a million acres of land, not accounting for rooftop solar installations. Increasing solar power to the energy grid will require significant additional land use.

How Does It Work?



1. The sun radiates energy.

2. Photon particles travel 93 million miles.

3. Silicon in the panels absorb the photon particles.

4. Electrons begin to move in an electric field, initializing the flow of electricity.

5. Metal conductive plates on cell collect electrons and transfer to wires.

6. Direct Current (DC) leaves the panel.

7. DC power is converted into usable Alternating Current (AC) electricity by the solar inverter.

8. AC power is either fed directly into the grid from a solar farm or directly into a breaker box for domestic use.

Point ⟷ Counterpoint

Point	Counterpoint
• Solar energy is a renewable form of power.	○ Solar technology requires mining and produces waste.
• Utility-scale installations can generate significant amounts of energy.	○ Large solar farms can harm or displace surrounding wildlife.
• Solar energy produces no emmissions.	○ The process to build and install solar generates emissions.
• Solar enery has the lowest fatality rate of any energy source.	○ Death and injury can occur at every stage, from mining to installation to maintenance.
• Greater use of solar power can offset power from fossil fuels, becoming a greater share of the energy mix.	○ Solar power is largely dependent on the weather and has a low maximum efficiency.

Did You Know?

At over 3,200 acres, Solar Star is America's largest solar farm. Solar Star is located in Kern and Los Angeles counties and has over 1.7 million solar pannels. It produces 579 megawatts of energy, which is enough energy to power over 250,000 homes.

What's Next?

A report by the U.S. Department of Energy Solar Energy Technologies Office (SETO) and the National Renewable Energy Laboratory (NREL) found that with major cost reductions and aggressive infrastructure policies, solar energy could make up as much as 40% of the U.S. energy mix by 2035 and 45% by 2050. The Department of Energy claims that this massive effort would employ 1.5 million people and keep the price of energy the same. To build the solar panels required to reach this increase, though, would put a massive strain on the manufacturing industry, and create a higher demand for aluminum, silicon, steel, and glass.