

The Environmental Benefits of Solar Power

Solar: The Numbers

The average emission rates in the United States from coal-fired generation are:

- 2,249 lbs/MWh of carbon dioxide
- 13 lbs/MWh of sulfur dioxide
- 6 lbs/MWh of nitrogen oxides.

The average emission rates in the United States from solar generation are:

- **zero** lbs of carbon
- **zero** lbs of sulfur dioxide
- **zero** lbs of nitrogen oxides
- **zero** lbs of air toxics



An 8-year extension of the Investment Tax Credit (ITC) will provide clean, domestically-produced, secure electricity while producing no greenhouse gases, air toxics, acid-rain gases, noise pollution, or wasted water.

“An average U.S. household uses 830 kilowatt-hours (kWh) of electricity per month. On average, producing 1000 kWh of electricity with solar power reduces emissions by nearly 8 pounds of sulfur dioxide, 5 pounds of nitrogen oxides, and more than 1,400 pounds of carbon dioxide.



During its projected 28 years of clean energy production, a rooftop solar energy system will avoid conventional electrical plant emissions of more than half a ton of sulfur dioxide, one-third a ton of nitrogen oxides, and 100 tons of carbon dioxide. Solar electricity is clearly a wise energy investment with great environmental benefits!”

- National Renewable Energy Laboratory (NREL), “Energy Payback: Clean Energy from PV”

Clean, Green, and Electric

Powerlight 505 kw installation for Johnson & Johnson



“By avoiding the purchase of fossil fuel generated electricity, the solar system installed at Johnson & Johnson’s Skillman campus spares the environment from thousands of tons of harmful emissions, such as nitrogen oxide, sulfur dioxide and carbon dioxide, major contributors to smog, acid rain and global warming. It is estimated that over the next 30 years, the solar generated electricity will reduce emissions of carbon dioxide by nearly 7,000 tons. These

emissions reductions are equivalent to removing almost 1,400 cars from the roadways.”

Energy By Solar Means

- Less Air Pollution - Solar power produces none of the on-site air pollution associated with fossil fuel energy generation, which increase health care costs and harm the environment. Solar power is even welcome in Los Angeles, where other new power sources are impossible to site because of air quality, noise, or green space concerns.
- Lower Greenhouse Gas Emissions - Every residential PV system reduces greenhouse gas emissions as much as removing one car from the road.
- Lower Water Consumption - Solar power uses 98% less water per MWh generated than even the most efficient natural gas generation.



Solar Energy Industries Association (SEIA) is the national trade association of solar energy manufacturers, dealers, distributors, contractors, installers, architects, consultants, and marketers. We work to expand the use of solar technologies in the global marketplace.

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Technology Highlights

Electricity from Photovoltaics

Photovoltaic systems consist of wafers made of silicon or other conductive materials. When sunlight hits the wafers, photons liberate electrons, resulting in the release of electricity. PV systems create no emissions while generating electricity and do not require the use of any water.



Electricity from Concentrating Solar Power

Concentrating Solar Power plants are utility-sized generators of electricity that use no fuel other than the sun and so have negligible emissions. CSP technology may tap local water resources if the liquid that is being heated to create steam is water. In this case, the water can be re-used after it has been condensed from steam back into water. CSP plants do not discharge any water while creating electricity. Also, CSP technologies do not produce any substantial amount of solid waste while creating electricity.



Electricity from Solar Water Heating

SWH systems collect the energy from the sun to heat air or a fluid, which then transfers solar heat directly or indirectly to your water supply. By installing a SWH system, a typical household can meet 50 to 80 percent of their hot water needs. By avoiding the energy that would otherwise have to come from fossil fuel generation, this can offset the equivalent of 40% to 100% of the carbon dioxide emissions of automobile. A typical residential solar water heater will offset greenhouse gas emissions by about 1,500 pounds of carbon dioxide (CO₂) per year, the equivalent of not driving your car two days per week.



SOLAR CASE STUDY:

The FALA installation in Farmingdale, New York is a public/private partnership between the Clean Energy Initiative program of the Long Island Power Authority (LIPA) and Fala Direct Marketing. The PV system covers over 100,000 square feet of roof and can generate up to 1.01 megawatts of electricity in peak sunlight conditions.



Source for facts and photo: Long Island Power Authority

- » The solar electricity generated by the system is enough to power 125 homes.
- » The system reduces Fala's peak load (the amount of electricity it must purchase at the most expensive time of the day) by 33%.
- » Over the course of 25 years, the system will avoid emitting over 20,000 tons of carbon dioxide, more than 30 tons of nitrous oxides, and more than 75 tons of sulfur dioxide from burning fossil fuels.
- » To otherwise reduce the same amount of greenhouse gas emission would require planting 5,700 acres of trees, removing 3,900 cars from the road, or driving 50,000,000 less miles.
- » If the electricity created from the solar project was instead generated using oil, it would take 45,000 barrels.