SOLAR FARMS MAKE GOOD NEIGHBORS

Modern solar farms are quiet, safe, and do not create significant glare. Although they do modify the look of a landscape, they create no pollution, and they have not been found to adversely impact local property values.

Solar Energy and Human Health

Solar panels have not been linked to any adverse human health issues. On the contrary, they have proved beneficial to human health by displacing the air pollution caused by fossil fuel electric generation, conserving clean water, and reducing the harmful impacts of climate change. In fact, the health benefits created by the 20 GW of solar power that was installed in the United States through 2014 saved Americans about $890 million per year.[1] The amount of installed U.S. solar capacity has more than tripled since then.[2]

The North Carolina Clean Energy Center at North Carolina State University conducted an exhaustive study examining the fire, safety, and public health risks of utility-scale solar energy projects, including concerns regarding toxicity, electromagnetic fields, and electric shock potential. For each of these concerns, the study concluded that "the negative health and safety impacts of utility-scale PV development were shown to be negligible, while the public health and safety benefits of installing these facilities are significant and far outweigh any negative impacts."[3]

Solar Farms and Fire Risk

Evidence shows that fires caused by solar equipment are rare, and they only occur if an improper connection or other electrical fire hazard is present. In most circumstances, good system design, product selection, and installation procedures are enough to minimize the risk of fire to the greatest extent possible.[4] These concerns are further addressed by product safety standards, National Electrical Code provisions, and inspections that take place prior to solar facility energization.[5]

Another factor that limits solar panel fires is the small portion of materials in the panels that are flammable, which prevents them from self-sustaining a significant fire. The majority of each solar panel is composed of nonflammable material, primarily one or two layers of protective glass that make up over three quarters of the panel's weight.[6]

Solar Panels and Heat Islands

Like roads or parking lots, solar farms with dark modules may cause a small amount of local heating due to the panels' absorption of solar radiation and their minimal heat generation.[7] However, there is little evidence of any negative impacts from this effect. Research shows that any additional heating caused by panels is concentrated at the immediate solar farm site and dissipates quickly. No effect can be measured just 100 feet away from the solar facilities.[8]

SOLAR FARMS MAKE GOOD NEIGHBORS

Solar Farms and Sound

Solar panels have no moving parts, so they do not produce any sound on their own. Inverters convert direct current (DC) electricity generated by a solar panel into alternating current (AC) electricity that is used for our power supplies. The inverters, an integral component of the solar facility, generate a very low decibel "hum" during daytime operations. A study by the Massachusetts Clean Energy Center measured sound from inverters at various distances and found the sound they produce is negligible and becomes completely inaudible at 50 to 150 feet away.[9] The minimal amount of sound derived from an inverter can be controlled by insulating the inverter with sound-proofing material, shielding the inverter with landscape plantings, or siting the inverter so that it is located away from homes or businesses.

Conveniently, even these inverters are completely silent during nighttime hours, because solar farms are only actively producing power during the day. Furthermore, inverters used at solar facilities are subject to performance standards established by the Institute of Electrical and Electronics Engineers (IEEE) and Underwriters Laboratories (UL), which ensure that inverters do not generate excessive noise or harmonics that can affect the power grid.[10] Few studies have been performed to measure sound at solar projects, but this is because noise from solar farms has not emerged as a significant issue for existing projects.

Solar Farms and Glare

The solar panels that will be used on Apex projects have surfaces designed to absorb sunlight and minimize reflection. This design helps maximize the electricity production efficiency of the panels. According to the FAA's 2018 Airport Solar Guide, solar photovoltaic systems are "designed to absorb sunlight (rather than reflect it), minimizing potential impacts of glare."[11] Modern PV panels are estimated to reflect about 2% of the light that strikes them, a value that is lower than that of grass, forest, water, crops, and snow.[12] The fact that solar panels do not produce significant glare can be demonstrated by the fact that there are currently more than 15 airports in the United States that have solar energy facilities safely located and operating on site.[13]

1. Ryan Wiser et al., "On the Path to SunShot: The Environmental and Public Health Benefits of Achieving High Penetrations of Solar Energy in the United States," Lawrence Berkeley National Laboratory and National Renewable Energy Laboratory, 2016, https://www.nrel.gov/docs/fy16osti/65628.pdf.
2. Solar Energy Industries Association (SEIA), "Solar Industry Research Data," https://www.seia.org/solar-industry-research-data.
3. North Carolina State University, NC Clean Energy Technology Center, "Health and Safety Impacts of Solar Photovoltaics," May 2017, http://ncsolarcen-prod.s3.amazonaws.com/wp-content/uploads/2017/10/Health-and-Safety-Impacts-of-Solar-Photovoltaics-2017_white-paper-1.pdf.
4. Robin Whitlock, "Are solar energy inverters a fire risk? In a word – no," Interesting Engineering, January 20, 2016, https://interestingengineering.com/solar-energy-inverters-fire-risk-word-no.
5. Solar Energy Industries Association (SEIA), "Fire Safety and Solar," https://www.seia.org/initiatives/fire-safety-solar
6. North Carolina State University, NC Clean Energy Technology Center, "Health and Safety Impacts of Solar Photovoltaics," May 2017, http://ncsolarcen-prod.s3.amazonaws.com/wp-content/uploads/2017/10/Health-and-Safety-Impacts-of-Solar-Photovoltaics-2017_white-paper-1.pdf.
7. Greg A. Barron-Gafford et al., "The Photovoltaic Heat Island Effect: Larger Solar Power Plants Increase Local Temperatures," Scientific Reports 6, article no. 35070 (2016), https://www.nature.com/articles/srep35070.
8. Graham Binder, "Researchers discover solar heat island effect caused by large-scale solar power plants," Phys Org, November 7, 2016, https://phys.org/news/2016-11-solar-island-effect-large-scale-power.html#jCp.
9. Peter H. Guldberg, "Study of Acoustic and EMF Levels From Solar Photovoltaic Projects," TechEnvironmental, Inc., prepared for the Massachusetts Clean Energy Center, 2012, http://files.masscec.com/research/StudyAcousticEMFLevelsSolarPhotovoltaicProjects.pdf.
10. Soonwook Hong and Michael Zuercher-Martinson, "Harmonics and Noise in Photovoltaic (PV) Inverter and the Mitigation Strategies," Solectria Renewables, https://www.solectria.com/site/assets/files/1482/solectria_harmonics_noise_pv_inverters_white_paper.pdf.
11. Federal Aviation Administration (FAA), "Technical Guidance for Evaluating Selected Solar Technologies on Airports," April 2018, https://www.faa.gov/airports/environmental/policy_guidance/media/FAA-Airport-Solar-Guide-2018.pdf.
12. Spaven Consulting, "Solar Photovoltaic Energy Facilities: Assessment of Potential for Impact on Aviation," January 2011, https://www.solarchoice.net.au/wp-content/uploads/Reflectivity-of-Solar-Electric-PV-Modules.pdf.pdf.
13. FAA, "Technical Guidance for Evaluating Selected Solar Technologies on Airports."