

Questions and Answers

What is Concentrated Solar Power (CSP)?

CSP forms include solar trough, linear Fresnel, power tower, and dish. Solar trough, linear Fresnel, and power tower use a steam cycle, which entails using an energy source to generate steam that spins a turbine, thereby generating electricity. After generating electricity, the steam passes through a condenser to cool. Dish involves a mechanical engine that uses heat energy to move piston.

Why has there been support for utility-scale?

Utility-scale solar refers to projects with greater than 20 MW generating capacity and remains attractive for its ability to generate and store large quantities of energy. U.S. policy regarding renewable energy has made it a target to produce large quantities of electricity given high demand. In order to shift the country from fossil fuels, the federal government targeted expansion of renewable sources. In fact, in 2012, the Bureau of Land Management produced a Programmatic Environmental Impact Statement (PEIS) for utility-scale solar energy development on BLM administered lands in six southwestern states.

The PEIS made it possible for utility-scale developers to expedite projects in the region.

Is Rooftop Solar a feasible replacement?

Storing power and fluctuations in the capacity to generate power challenge PV solar's viability. To meet energy demand while avoiding utility-scale projects, microgrids and community scale-projects could supplement rooftop solar. .

References:

Morgan Walton, A Lesson From Icarus: How The Mandate for Rapid Solar Development Has Singed A Few Feathers, 40 Vt. L. Rev. 131.

Robert Glennon & Andrew M. Reeves, Solar Energy's Cloudy Future, 1 Arizona J. Env'tl. L. & Pol'y 91

Rachel Y. Chock, Evaluating Potential Effects of Solar Power Facilities on Wildlife from an Animal Behavior Perspective, Conservation Science and Practice, Apr. 27, 2020

International Renewable Energy Agency and International Energy Agency Photovoltaic Power Systems, End-of-Life Management: Solar Photovoltaic Panels, (2016).

W Lands Project v. United States BLM, 2014 U.S. Dist. LEXIS 87189, at *1 (S.D. Cal. June 25, 2014).

Aiman Alshare et al., *Environmental Impact of Wind and Solar Energy*, J. Sustain Devel., (2022).

Why incentivize rooftop solar and recycling PV panels?

Solar energy is a burgeoning field. To reduce carbon emissions and maintain living standards, the world must transition to renewable energy systems. In 2022, the U.S. still obtained about 60% of its power through fossil fuels. Only 3.4% of U.S. energy came from solar power. In order to comply with sustainability initiatives, the transition to renewables, including solar seems inevitable, but should occur in a sustainably to avoid perpetuating environmental and ecological damages. .

Does Rooftop PV threaten wildlife?

No. Rooftop solar makes use of already existent structures like homes and businesses. By using existent establishments, rooftop solar avoids land alterations associated with utility-scale projects. Unlike power tower projects, rooftop panels do not present a risk of burning avian species in a solar flux zone. Clustering panels on rooftops as opposed to across vast spaces avoids the "lake effect" that harm avian species.

Will the solar industry oppose residential incentives and recycling?

No. Solar manufacturers can continue to generate profits by producing PV panels and through any relevant innovations. Likewise, recycling can reduce the costs of production helping profit margins. It is likely that like California's proposed legislation, interests of both consumers and producers will need consideration when assigning recycling costs.

Changing Solar Policy

Overview:

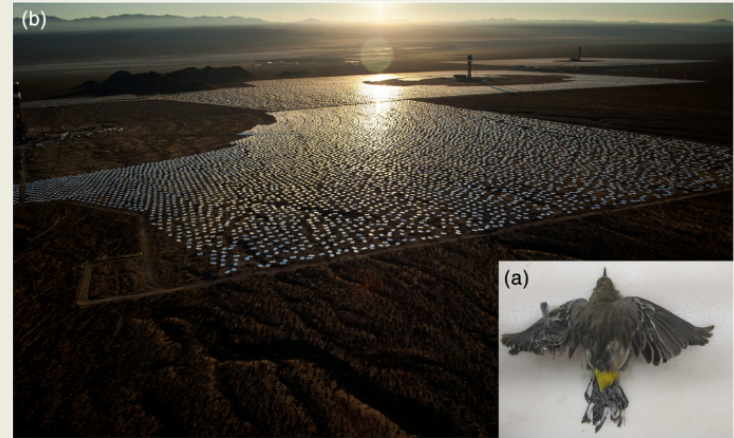
Solar energy provides a bright solution to help reduce carbon emissions. Utility-scale projects, however, can harm wildlife through habitat degradation and heat-related mortality for avian species. A common means to generate solar power--photovoltaic panels--can support residential and communal projects that avoid many negative impacts on wildlife associated with utility-scale projects. Photovoltaics have a lifecycle however, and can contribute to electronic waste without proper measures in place. To continue the shift to renewable energy and role for solar, a means for recycling panels established before panels go offline.

Background:

- Utility-scale solar generated an estimated 3.4% of electricity in the country for 2022
- The Clean Energy Innovation and Deployment Act of 2020 targets establishing net-zero greenhouse gas emissions that reliably meet the nation's projected energy demand by 2050
- Public Land Renewable Energy Development Act of 2023 indicates that the Secretary of the Interior, in consultation with the Secretary of Energy, establish priority areas on covered land for geothermal, solar, and wind energy projects.
- Utility-scale projects use either concentrated solar power(CSP) or Photovoltaic (PV) methods to harness solar energy

Issue:

- Land use requirements for utility-scale projects can directly and indirectly alter habitat use via functional habitat fragmentation, dispersal limitations, population isolation, and altered habitat quality.
- CSP projects require cooling which affects local climates and hydrology.
- Construction of utility-scale projects involves disturb soil, challenging habitat and vegetation
- At power tower projects, birds, bats, and bugs die because of acute exposure to the zone of solar flux
- Birds also perish because of electrocution on energized portions of the project, entrapment or entanglement with project infrastructure such as fencing, and drowning in solar evaporation ponds.
- Ivanpah, a California solar tower project, killed an estimated 7.19 birds per gigawatt hour in 2015.
- Solar facilities' maintenance creates dust, which can disrupt habitat in arid and semiarid regions
- Estimates suggest the U.S. will have as much as one million tons of solar panel waste by 2030
- Some solar panels contain harmful metals like lead and cadmium



Proposed Solution:

A policy package that targets increasing the use of rooftop solar in an area, while also ensuring a responsible PV market through a recycling program provides a full circle approach to sustainable solar. Increasing the use of rooftop solar will help spur a reduction in carbon emissions. By increasing individual residences' energy independence through PV panels, the need for utility-scale projects will decrease. By decreasing the need for utility-scale projects, the incentive for investment will decrease, lowering the number of new projects, and preventing greater disturbances to wildlife. Ensuring the proper treatment of PV panels after their useful lifespan will enable the use of rooftop solar while minimizing waste and problems associated with obtaining the necessary materials for renewable energy. With an increase in PV solar use in residential and small-scale areas, the importance of properly dealing with decommissioned panels grows. A global e-waste problem already abounds, attempting to reduce carbon emissions in the energy sector should not facilitate additional problems of pollution. Implementing a recycling program like that in the state of Washington and recently proposed in California can help avoid problems associated with solar panel waste..



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