



WILD ENERGY:

Building a Renewable Energy Future for Wildlife and the Planet

Horned lizards and other wildlife have lost significant habitat to poorly-sited solar farms, and are examples of why we need wildlife-friendly renewable energy sources.

U.S. dependence on energy from fossil fuels is at the core of major threats to biodiversity worldwide, stripping wildlife of a healthy climate, habitat, and clean air and water they need to survive. But with wildlife-friendly renewable energy, we have the opportunity to produce power with minimal negative impacts to wildlife and wild places.

The transition to a wildlife-friendly renewable energy system is not only possible as technology improves and costs drop, but necessary to curb climate change, protect endangered species and avoid other environmental consequences of fossil fuel development and consumption. Every energy source comes with its own costs and benefits, but with wildlife-friendly renewable energy, we can ensure that the benefits far outweigh the costs.

WHAT IS “WILDLIFE-FRIENDLY RENEWABLE ENERGY”?

Wildlife-friendly renewable energy includes only those renewable energy sources that have a minimal impact on wildlife and the environment — including photovoltaic (PV) solar installations built on already existing structures and well-sited, well-managed wind and PV solar installations built on already-degraded environments.

Ideally wildlife-friendly energy sources will be built close to where the energy will be consumed to reduce the need for new transmission lines and the efficiency loss associated with long-distance energy transmission. It's important to keep in mind that not all energy projects commonly referred to as “renewable” are truly sustainable or good for wildlife. For example, dams to produce hydropower alter entire river ecosystems, biomass made from trees significantly contributes to climate change and habitat loss, and even large-scale solar and wind farms destroy habitat and can result in concerning levels of bird and bat mortalities when poorly designed or sited. These types of projects would not be considered wildlife-friendly renewable energy.

CLIMATE AND AIR

Climate change is one of the greatest threats to biodiversity. Fortunately most renewable energy sources produce little to no greenhouse gas emissions.¹ Compared with coal, which emits between 1.4 to 3.6 pounds of carbon dioxide equivalent per kilowatt-hour (CO₂ E/kWh) of energy produced, wind and photovoltaic (PV) solar emit only 0.02 to 0.04 and 0.07 to 0.2 pounds of CO₂ E/kWh, respectively.² According to a report by the Intergovernmental Panel on Climate Change, life-cycle global warming emissions from PV solar and wind — including emissions from producing and transporting materials — are minimal.¹

Wildlife-friendly renewable energy produces little to no global warming emissions or other harmful air pollutants.

Air-quality benefits from renewable energy extend beyond global warming emissions. Air pollutants such as mercury, nitrous oxides (NO_x), sulfur dioxide (SO₂), ozone and lead are all released into the environment by fossil fuel-based energy production, particularly from coal sources.³ Not only do these air pollutants cause serious health problems for humans, disproportionately affecting communities of color and low-income neighborhoods, but wildlife also suffer from fossil fuel-related health impacts such as respiratory disease and cancer.^{4,5,6} Fossil fuel-caused air pollution further threatens wildlife in that it can harm ecosystems by altering native plant communities. For instance, atmospheric ozone (O₃) can stunt growth in various plant species, and these changes in turn affect the quality of habitat and food sources available to wildlife. Most renewable energy sources, by contrast, release negligible emissions.¹

WATER

Water withdrawal for power production harms wildlife in several ways. In the simplest sense, when freshwater is consumed in energy production, it reduces the amount available for sustaining ecosystems, for both people and wildlife. Fossil fuel-based energy generation requires water for cooling power plants and extracting fuels, with varying amounts of water required depending on the energy source, while wildlife-friendly renewable energy sources require virtually no water to generate power. This contrast is especially significant in areas affected by drought. According to research on water consumed in electricity production from a variety of energy sources, the energy sector can most effectively reduce its water use by replacing fossil fuel and hydroelectric power with renewable sources such as PV solar and wind.⁷

Photovoltaic solar- and wind-energy sources require virtually no water to generate power.



Fossil fuel extraction, production and combustion have disastrous consequences for water systems that go beyond direct water consumption, including thermal pollution, physical effects on wildlife, ecosystem destruction and contamination. Even when water from fossil fuel-based energy generation is able to be recycled back into the environment, it is common for water to be returned at higher temperatures, harming fish and other wildlife.⁸ Water withdrawal to cool industrial energy plants can trap fish and other aquatic

wildlife in intake systems.⁹ Mountaintop-removal methods of coal mining have destroyed entire stream ecosystems, some of which were once the most biologically diverse in the United States.¹⁰

Examples of water contamination from fossil fuel development are extensive. Hydraulic fracturing, or “fracking,” has been linked to stream, river and aquifer contamination. Oil spills such as the Deepwater Horizon in the Gulf of Mexico in 2010 and the spill along the coast of Santa Barbara, Calif. in 2015 have resulted in thousands of wildlife deaths. Wildlife-friendly renewable sources, such as PV solar and wind, involve virtually no risk of thermal pollution or water contamination.

LAND

Land-use impacts of energy production vary by energy source. In general, electricity plants for both renewable and fossil fuel sources require large areas of land, with the exception of PV solar installations in the built environment, such as on rooftops of homes and businesses and in parking lots. The amount and type of land required depends on the facility. Unlike renewable energy sources, however, fossil fuels also require large amounts of land to extract, refine and transport the fuels, with serious associated risks. This makes their overall land-use impact far more destructive than that of siting renewable energy sources.¹¹

When renewable energy projects are planned with wildlife and sustainability in mind, they have a much smaller land-use footprint than traditional energy sources.

As with air and water concerns, all fossil fuel sources risk soil contamination during extraction and transportation, with oil spills and leaks being common occurrences. The process of extracting, refining and transporting fossil fuels also disrupts wildlife migration routes, alters wildlife behavior, fragments habitat, disturbs soil and assists the spread of invasive plant species.^{12,13} Also, fossil fuel projects often take place on public lands, with large projects in sensitive areas such as national wildlife refuges and national forests, sage brush steppe and grasslands. The Center for Biological Diversity is working to stop fossil fuel development and industrialization on public lands to keep them safe for wildlife, plants and people.

When renewable energy projects are planned with wildlife and sustainability in mind, they have a much smaller land use footprint than traditional energy sources. PV solar panels built on existing structures or already degraded environments have minimal wildlife-related land-use impacts, as these environments generally provide little habitat for sensitive species.^{14,15} Although most wind-energy projects require large amounts of land, the space around the turbines can sometimes be used by other species or for agriculture. Siting for new wind and PV solar projects should be prioritized on already disturbed land. Smart siting and management strategies to prevent wildlife



deaths from collisions with turbines are also necessary for wind-energy projects to be considered wildlife-friendly, although in some cases this will not be enough to sufficiently protect endangered birds or other animals. Therefore, all new large-scale renewable projects should include environmental reviews that take a fair look at alternative sites to avoid significant impacts to sensitive species, habitats, water and other resources from the project and the associated transmission lines and substations.

The climate crisis and environmental devastation caused by our energy system have made it clear that we can't wait any longer to end our addiction to fossil fuels. This is why the **Center for Biological Diversity** is reimagining where our energy should come from and how we use it to create a vision for a renewable energy future that is beneficial for both humans and wildlife. In fighting for the transition away from fossil fuels, we all have the opportunity and responsibility to plan renewable energy projects in ways that minimize negative impacts on wildlife: By accounting for sustainable materials in production, water use, protecting migration corridors and sensitive species habitats; by focusing development on already-built or degraded environments; and by significantly increasing energy efficiency, reducing consumption and human population growth. By doing so, we can ensure that our energy future is not just renewable, but one where all species can thrive.



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