

# FACT SHEET: ENVIRONMENTAL IMPACTS OF RENEWABLE ENERGY— WIND AND SOLAR

Renewables have been the fastest growing energy source since 2017 when costs reached a key milestone. Costs dropped enough to make wind and solar the cheapest form of conventional energy.<sup>1</sup> Rural communities often carry this infrastructure. This fact sheet looks at the environmental impacts of wind and solar development.

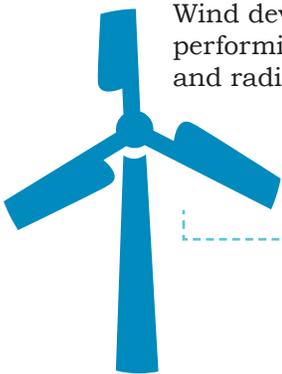


## WIND

- Bird and bat species are a top concern for protection from wind turbines.



Especially key protected, threatened, or endangered species: Indiana bat, northern long-eared bat, little brown bat, tri-colored bat, and bald eagles.



Wind developers are now performing acoustic surveys and radio tracking of threatened species to understand migration, mating, and nesting habits.

- Each developer must file for an Incidental Take Permit with the nearest U.S. Fish & Wildlife Service Ecological Services Office, which sets a limit to the amount of damage by wind turbines to vulnerable species.



That application includes a Habitat Conservation Plan detailing how the developer will not only avoid damaging, but protect vulnerable species.<sup>2</sup>

- These plans are part of complying with the Endangered Species Act.<sup>3</sup>
- Operating wind farms must conduct baseline bird and bat fatality monitoring in compliance with state and federal law.
- ✓ Turbines are checked weekly for bird and bat fatalities.
- Investing in habitat conservation and considering the nesting and migration patterns are also options to meet requirements.

1 “Levelized Cost of Energy and Levelized Cost of Storage 2018.” Lazard, Nov. 8, 2018, [lazard.com/perspective/levelized-cost-of-energy-and-levelized-cost-of-storage-2018/](https://www.lazard.com/perspective/levelized-cost-of-energy-and-levelized-cost-of-storage-2018/). Accessed December 2018.

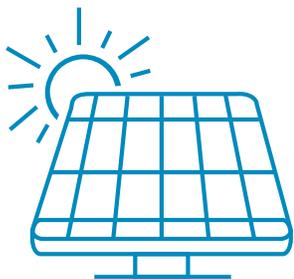
2 “Habitat Conservation Plan Handbook.” U.S. Fish & Wildlife Service, Jan. 18, 2018, [fws.gov/endangered/what-we-do/hcp\\_handbook-chapters.html](https://www.fws.gov/endangered/what-we-do/hcp_handbook-chapters.html). Accessed December 2018.

3 “Habitat Conservation Plans: Section 10 of the Endangered Species Act.” U.S. Fish & Wildlife Service, Aug. 29, 2018, [fws.gov/midwest/endangered/permits/hcp/hcp\\_wofactsheet.html](https://www.fws.gov/midwest/endangered/permits/hcp/hcp_wofactsheet.html). Accessed December 2018.



# SOLAR

- Land used for utility scale solar projects can cause habitat loss.
  - » Pollinator-friendly solar sites can combine habitat for pollinators with solar arrays, and has been supported through state policy in Maryland, Minnesota, New York, and Illinois.<sup>4,5</sup>
- Three states—Connecticut,<sup>6</sup> North Carolina,<sup>7</sup> and Washington<sup>8</sup>—have passed policies restricting siting solar projects on agricultural land through either state legislation or county ordinances.
  - » As an alternative, low-impact solar and co-location of solar and agriculture is a growing area of research with three categories of design:
    1. Solar-centric
    2. Vegetation-centric
    3. Co-location<sup>9</sup>



**Solar developers have found that combining solar generation with pollinator habitat or grazing land can reduce operations and maintenance costs.<sup>10</sup>**

4 “Conservation: (525 ILCS55/1) Pollinator Friendly Solar Site Act.” Illinois General Assembly, Aug. 21, 2018, [ilga.gov/legislation/ilcs/ilcs3.asp?ActID=3900&ChapterID=44](http://ilga.gov/legislation/ilcs/ilcs3.asp?ActID=3900&ChapterID=44). Accessed December 2018.

5 “Department of Natural Resources - Solar Generation Facilities - Pollinator-Friendly Designation.” General Assembly of Maryland, June 1, 2017, [mgaleg.maryland.gov/webmg/frmMain.aspx?pid=SB1158&stab=01&pid=billpage&tab=subject3&ys=2017rs](http://mgaleg.maryland.gov/webmg/frmMain.aspx?pid=SB1158&stab=01&pid=billpage&tab=subject3&ys=2017rs). Accessed December 2018.

6 “File No. 275: An Act Concerning the Installation of Certain Solar Facilities on Productive Farmlands.” State of Connecticut General Assembly, March 28, 2017, [cga.ct.gov/2017/fc/2017SB-00943-R000275-FC.htm](http://cga.ct.gov/2017/fc/2017SB-00943-R000275-FC.htm). Accessed December 2018.

7 “PB 16-28.” Currituck County Board of Commissioners, Feb. 20, 2017, [co.currituck.nc.us/wp-content/uploads/2017/12/pb-16-28-currituck-county-udo-amendment-chapter-4-use-standards-02-20-2017.pdf](http://co.currituck.nc.us/wp-content/uploads/2017/12/pb-16-28-currituck-county-udo-amendment-chapter-4-use-standards-02-20-2017.pdf). Accessed December 2018. This ordinance was put in place in February 2017 and repealed 18 months later.

8 “Solar Regulations.” Kittitas County Washington, Aug. 24, 2018, [co.kittitas.wa.us/uploads/cds/comp-plan/SFCAC/Proposed-Amendments-KCC-Regarding-Solar-Power-Production-Facilities.pdf](http://co.kittitas.wa.us/uploads/cds/comp-plan/SFCAC/Proposed-Amendments-KCC-Regarding-Solar-Power-Production-Facilities.pdf). Accessed December 2018.

9 Mow, Benjamin. “Solar Sheep and Voltaic Veggies: Uniting Solar Power and Agriculture.” U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy–National Renewable Energy Laboratory, June 6, 2018, [nrel.gov/state-local-tribal/blog/posts/solar-sheep-and-voltaic-veggies-uniting-solar-power-and-agriculture.html](http://nrel.gov/state-local-tribal/blog/posts/solar-sheep-and-voltaic-veggies-uniting-solar-power-and-agriculture.html). Accessed December 2018.

10 Macknick, Jordan. “Overview of Opportunities for co-location of agriculture and solar PV.” U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy–National Renewable Energy Laboratory, June 14, 2016, [eandt.org/wp-content/uploads/2013/01/NREL-Overview-of-opportunities-for-co-location-of-agriculture-and-solar-PV-1.pdf](http://eandt.org/wp-content/uploads/2013/01/NREL-Overview-of-opportunities-for-co-location-of-agriculture-and-solar-PV-1.pdf). Accessed December 2018.

