

Iowa Solar and Agriculture

Solar and Prime Farmland

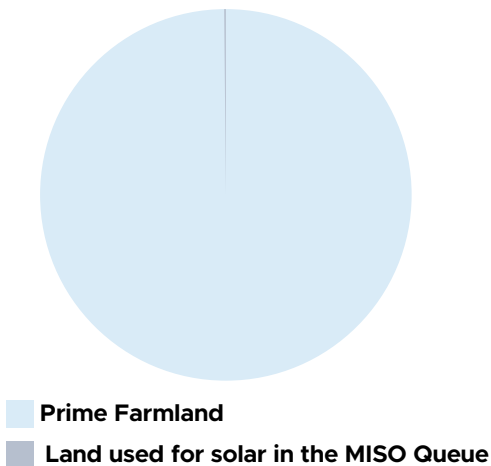
Iowa is home to about 30.6 million acres of farmland, about 18 million acres of which are considered “prime.”¹

- Wind and solar are compatible and profitable ways farmers can grow their business as the stewards of their own land.
- Solar farms are developed on prime farmland for a variety of reasons, including access to the electric grid.
- Iowa has a significant amount of prime farmland, which makes it hard to avoid.

For Perspective...

There are 3,000 MW of solar in the MISO Queue across Iowa,² requiring approximately 25,500 acres of land.³ If every solar farm were sited on prime farmland, only 0.14% of Iowa's total prime farmland would be used.

Iowa Prime Farmland¹



Solar Land Use

Land used for solar remains versatile, coexisting with a variety of conservation efforts.

- An average of between 7 and 10 acres of land are required to produce one megawatt (MW) of electricity from solar energy.³
- Some projects pair beehives with pollinator-friendly native plants and flowers in and around the project area, which can recharge groundwater and reduce soil erosion, at the same time increasing yield of pollinator-dependent crops, such as soybeans.⁴

prime·farm·land

NOUN

Land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses.

Agrivoltaics: A Value-Added Farmer Friendly Solution

Combining traditional farming and solar technology is called agrivoltaics, which have a wide range of benefits for farmers, both immediate and long-term.⁵

- Mowing under panels is expensive, especially at the utility-scale. Some projects employ sheep or even cattle grazing as a vegetation management strategy, which will become increasingly valuable as projects grow in size.^{6,7}
- Conservation and vegetation plans amidst renewables lead to healthier soil, improved water storage and filtration, sequestration of carbon, erosion reduction, habitat preservation and lower local energy costs.⁸

Property Rights

A landowner has the right to make decisions about how their land is used.

Renewables...

- Help diversify income portfolios.
- Are harvested all year long.
- Are drought-proof, high-yield land outputs that can produce for decades at a time without expensive inputs like fertilizers, pesticides, and irrigation.

American Clean Power Estimates
IA Farmers, Ranchers,
& Landowners Receive

\$850K

in annual land-lease
payments from solar

Crop	Production Value per 2,500 acres	Harvested Acreage Actual
Solar	\$13,062,540	2,500*
Corn	\$3,400,000	12,900,000
Soybeans	\$2,076,750	10,100,000
Hay	\$1,280,175	1,200,000
Oats	\$1,082,000	130,000

*Approximate
 Note: Crop values calculated using data from USDA NASS

Current Solar Crop Values in Iowa

Iowa has 260 MW of solar⁹, occupying approximately 2,500 acres of land.

- In 2021, IA solar projects generated over 224,906 MWh of electricity¹⁰
- At a value of \$58.08 per MWh,¹¹ Iowa's existing solar footprint has an annual production value of over \$13 million.

Our Calculations

SOLAR

MWh * Avg price of electricity = Production Value

CROPS

Yield per acre * 2,500 = Yield per 2,500 acres

Yield per 2,500 acres * Price per unit = Production Value

Sources

1. U.S. Department of Agriculture. 2020. Summary Report: 2017 National Resources Inventory, Natural Resources Conservation Service. https://www.nrcs.usda.gov/sites/default/files/2022-10/2017NRISummary_Final.pdf
2. MISO, 2022. Generator Interconnection Queue. https://www.misoenergy.org/planning/generator-interconnection/GI_Queue/
3. Birkholz, D. et al. 2020. "Solar Energy Production and Prime Farmland," Minnesota Department of Commerce and Minnesota Department of Agriculture. <https://mn.gov/eera/web/doc/13929/>
4. Siegner, K. et al. 2019. "Maximizing Land Use Benefits from Utility-Scale Solar," Yale Center for Business and the Environment. <https://cbey.yale.edu/research/maximizing-land-use-benefits-from-utility-scale-solar>
5. Lane, C. 2022. "Agrivoltaics: How Solar and Farmland Can Fight Climate Change." Solar Reviews Blog. <https://www.solarreviews.com/blog/all-about-agrivoltaics>
6. American Solar Grazing Association. <https://solargrazing.org/what-is-solar-grazing/>
7. University of Minnesota, Morris, "Agrivoltaics to Shade Cows." <https://wcroc.cfans.umn.edu/research/dairy/agrivoltaics>
8. Benage, Megan, et al. "Guidance for Developing a Vegetation Establishment and Management Plan for Solar Facilities." Environmental Review of Energy Projects, MN Commerce Department; Division of Energy Resources, Mar. 2021, <https://apps.commerce.state.mn.us/eera/web/page/home>
9. American Clean Power Association, 2022. Data Search, Clean Power IQ.
10. EIA, 2021. "State Electricity Profiles." <https://www.eia.gov/electricity/state/iowa/>
11. Calculated average MISO wholesale price of electricity based on EIA 2021 data.