

Cattle Voltaics: Maximizing Land Use with Solar Cattle Grazing

Solar grazing has emerged as a valuable practice with the rising demand for solar energy projects. Using livestock to manage vegetation at solar sites helps maintain the agricultural use of the land, provides new income streams for local farmers, and offers economic and environmental benefits.

Solar grazing refers to the practice of managing vegetation on solar farms with livestock, typically sheep. However, integrating cattle with solar grazing has become an increasingly popular approach in dual-use solar. Often referred to as “cattle voltaics,” the dual-use solar practice combines cattle grazing with solar energy generation.



Photo: Huwa Enterprises

Economic benefits

Solar grazing offers a range of economic benefits for farmers and livestock owners.

- By allowing pastures to serve as dual-use solar sites, farmers can generate additional income through lease payments while continuing to use their land for grazing livestock.
- The diversification strengthens farm resilience and provides a stable revenue stream.
- Additionally, the shade created by solar panels reduces heat stress in cattle, which can lead to improved lactation rates and increased weight gain, further enhancing livestock productivity.¹



Dual-use solar, often referred to as agrisolar or agrivoltaics, is the practice of combining solar generation and agricultural production on the same land.

Sources

¹ Sharpe, K.T., et al. “Evaluation of Solar Photovoltaic Systems to Shade Cows in a Pasture-based Dairy Herd.” *Journal of Dairy Science*, March 2021, doi.org/10.3168/jds.2020-18821. Accessed December 2024.



Environmental benefits

Solar grazing can enhance the agricultural land value of a solar array site by integrating livestock with native vegetation.

- The vegetative cover prevents topsoil loss and soil degradation while supporting the restoration of the land for future use.²
- The deep roots of native vegetation encourage water infiltration and reduce runoff.³
- The movement of cattle on the land spreads fertilizer naturally to promote healthier soils.

Management considerations

Developers and farmers must collaborate to establish contracts that address the needs of both parties, as long-term agreements enable farmers to invest in best practices tailored to their requirements.

- Site managers should prioritize the maintenance of fences, gates, and water access while ensuring appropriate insurance is in place.⁴
- Clear contracts specifying site access permissions are crucial for safeguarding animals, equipment, and personnel.
- The size of cattle used for solar grazing is also important to consider; cow-calf pairs, yearlings, or feeder cattle are ideal for solar grazing, and employing rotational grazing strategies can optimize land use effectively.⁵

Structure considerations

When incorporating cattle grazing with solar projects, the cattle's size and behavior require unique site design and management considerations. Tailored adaptations ensure both the cattle's safety and the solar infrastructure's functionality.

- Solar panels should be installed at a height of 6 to 8 feet to accommodate cattle grazing; if rotation-axis panels are used, they can be set at 6 feet when cattle are present.
- A distance of 17 to 20 feet should be maintained between rows, although this can vary based on agreements between developers and landowners.⁶
- To further protect the solar panels from cattle interference, measures such as fencing, burying cables, benching, and proper placement of inverters can be implemented.⁷
- Additionally, solar sites should provide water access for cattle.



Photo: Huwa Enterprises

Sources, continued

2 Dreves, Harrison. "Beneath Solar Panels, the Seeds of Opportunity Sprout: Low-Impact Development of Solar Installations Could be Win-Win-Win for Food, Water, and Renewable Energy." National Renewable Energy Laboratory, April 1, 2019, [nrel.gov/news/features/2019/beneath-solar-panels-the-seeds-of-opportunity-sprout.html](https://www.nrel.gov/news/features/2019/beneath-solar-panels-the-seeds-of-opportunity-sprout.html). Accessed December 2024.

3 Ibid.

4 "Recommendations." American Solar Grazing Association, solargrazing.org/recommendations. Accessed December 2024.

5 Personal communication, Josh Bennett and Brent Huwa, Huwa Enterprises, Jan. 13, 2025. Huwa Enterprises is a company located in Colorado that consults with developers and ranchers to create solar farms that work for cattle grazing.

6 Ibid.

7 Ibid.

