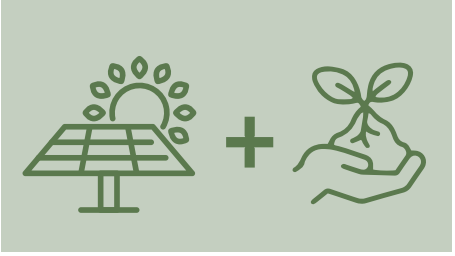
Fact Sheet:

Unlocking the Dual Benefits of Solar Energy and Conservation Practices



As the demand for clean, renewable energy grows, so does the opportunity to explore how to best manage the land used to host these projects. Solar energy development, often seen as a trade-off with agriculture or natural ecosystems, can be a powerful tool for conservation and good land stewardship.

By combining solar panels with conservation practices like prescribed grazing, native grass plantings, and pollinator habitat, landowners can generate clean energy, improve soil health, and enhance local biodiversity—all while keeping the land productive with a reliable income stream. Combining solar energy projects with land enrolled in federal conservation programs may offer landowners an opportunity to align their energy needs and conservation values. Furthermore, cost saving from on-farm generation or revenue from land-lease payments for solar projects could offer the financial support farmers need to adopt conservation practices that might otherwise be economically infeasible.

Solar compatibility with federal conservation programs

Combining solar energy with conservation practices allows landowners to generate steady income while supporting their ecological goals. With thoughtful design, this dual-use approach strengthens the economic and environmental benefits of the land.

Several conservation practices may be solar-compatible and eligible for financial and technical assistance through federal working lands conservation programs. Administered by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), these programs provide assistance to producers seeking to implement conservation on their land while maintaining agricultural production.

- **Conservation Stewardship Program (CSP)—** CSP supports continued conservation on productive agricultural lands, commonly referred to as working lands. It is designed to consider a producer's entire operation and help them care for the land and local resources without taking land out of production. Eligible producers must demonstrate that they are addressing regional resource concerns with approved conservation practices and are willing to implement enhancements into their operations.[1]

- **CSP enhancements—**CSP enhancements allow producers to further improve their conservation efforts with various activities beyond what the minimum standard requires.[2]

- **Environmental Quality Incentives Program (EQIP)—**This program is for farmers implementing conservation methods for the first time, in contrast to CSP, which supports continued conservation efforts. EQIP offers assistance for single practices or projects to help producers address a particular resource concern.[3]

With both programs, the producer will develop a conservation plan with support from local NRCS staff to ensure the implemented practices benefit natural resources and meet the producer's conservation goals.

Landowners interested in combining solar with conservation practices should work with their local NRCS field office to review their specific contracts, discuss the project, and determine compatibility. Find local field offices at nrcs.usda.gov/contact/find-a-service-center.

Sources

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Conservation practices to consider with solar

Pollinator habitat

Planting pollinator-friendly vegetation beneath and around ground-mounted solar arrays can create essential habitats that benefit both pollinators—like bees, butterflies, and other insects—as well as the surrounding agricultural areas. Native plants are well-suited to local soils and conditions, with most pollinator varieties offering deep, resilient roots that boost solar project performance and efficiency, while reducing environmental and community impact.[4] Once established, deep-rooted native plants lower costs by preventing erosion, suppressing weeds, retaining water, and requiring minimal maintenance.[5]

- **Federal programs supporting vegetation establishment and pollinator habitat**
  - » CSP offers enhancements like E420A for pollinator habitat establishment.[6]
  - » Seeding disturbed land with native species post-solar installation restores ecological function. EQIP supports vegetation establishment and invasive species control.[7]

Photo provided by Center for Pollinators in Energy

Soil and water conservation

Solar panels reflect sunlight and create shade, which reduces extreme temperature fluctuations, helps the soil stay cooler, and slows down water loss from heat.[8] Solar panels can lower plant evaporation, which is the process through which water is released into the atmosphere, and increase the amount of water soil can store and make available for plant use.[9] Shading creates a more favorable microclimate, potentially leading to increased yields, improved water conservation, and enhanced plant quality.

To maximize protection for soil and water during the construction and operation of a solar array, considering disturbance and compaction from heavy machinery, methods to preserve on-site topsoil, and an optimal design to control runoff and wind erosion is important.[10] Practices such as no-till, minimal grading, and use of existing access routes help preserve soil structure and promote natural erosion control on solar farm sites.[11] In addition, establishing new and preserving existing vegetation around project sites while incorporating deep-rooted vegetation can reduce erosion and runoff.

- **Federal programs supporting soil health and water management practices**
  - » Soil health: Implementing practices like cover cropping and no-till under solar arrays has the potential to reduce erosion and enhance soil organic matter. Both EQIP and CSP support such conservation practices.[12]
  - » Water management: Incorporating managed drainage or solar-powered water systems can improve water use efficiency. Both EQIP and CSP support water management practices.

Sources, continued

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Wildlife habitat

When designing a solar site, assessing how impacts on local wildlife could be minimized and habitat can be enhanced is important. Considering the layout and vegetation around solar panels can allow suitable habitats to be established for different birds, small mammals, and other species.[13] Incorporating permeable fencing and establishing wildlife corridors can allow solar farms to coexist with surrounding habitats and promote sustainable solutions.[14] In addition, careful selection of vegetation within the solar site and establishing vegetative buffers around the solar site with native species can help further foster biodiversity, stabilize soil, and provide food and shelter for wildlife.[15]

- **Federal programs supporting wildlife management practices**
  - » Installing fencing that allows movement of small animals maintains ecological connectivity. CSP's E382A enhancement focuses on wildlife-friendly fencing.[16]
  - » Wildlife corridors are important for maintaining healthy ecosystems and species populations by connecting fragmented habitats, enabling animal movement. CSP's E512J enhancement focuses on establishing wildlife corridors to provide habitat continuity.[17]

Grazing

Grazing livestock, like sheep, on solar sites offers a practical way to manage vegetation and reduce the need for mowing or using herbicides.[18] This approach not only reduces maintenance costs but also supports regenerative agriculture by improving soil health and promoting plant diversity. When done thoughtfully, solar grazing complements conservation goals by maintaining open habitat, supporting pollinators, and providing dual land use that benefits both farmers and ecosystems.

- **Federal programs supporting vegetation management with grazing practices**
  - » Integrating livestock grazing under solar panels can manage vegetation and improve land health. Both EQIP and CSP support conservation grazing efforts. CSP's E528 series includes enhancements for grazing management that benefit wildlife and soil health.

Conclusion

The intersection of solar energy and conservation presents a forward-thinking path toward sustainable land use. Rather than viewing clean energy development and ecological stewardship as competing interests, landowners, policymakers, and communities can embrace solar projects that support both. By integrating conservation practices into solar installations, growing energy demands can be met at the same time habitats are restored, soil resilience is built, local ecosystems supported, and financial benefits provided to landowners. Mindful solar energy project design can be a win for the environment, for land productivity, and for the future.

Sources, continued

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