Solar & Agricultural Land Use

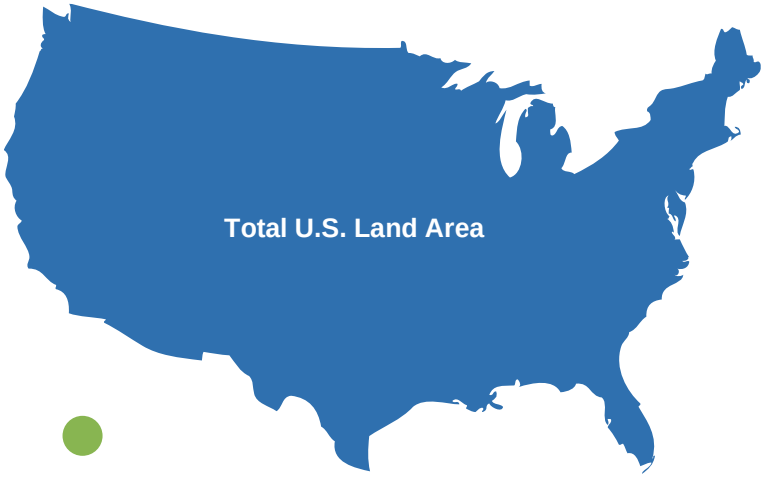
Solar and Agricultural Land Use Can Occur Harmoniously

As solar continues to expand into new markets, both rural and urban, land use discussions are likely to occur. In these discussions, it's important for participants to understand that solar in not a threat to agricultural activity, but rather a harmonious development that can assist the farming community.

- Solar can provide land with an opportunity to recover, when paired with the planting of native grasses and pollinators and be used for agricultural purposes in the future.
- Farmers can utilize solar as a steady revenue stream to help smooth out the impact of grain and produce market volatility.
- Installations of utility-scale solar continue to expand; however, they are still not a significant cause of the loss of agricultural land.

Solar Land Needs in the U.S.

As ground-mounted solar is expanding into more states, developers and farmers are looking to agricultural land for installations. Though renewable energy critics have claimed that ground-mounted solar farms are taking up large swaths of viable agricultural land, expanding urban areas and residential development accounted for nearly all lost farmland.[1] In the last decade, while North Carolina rose to become the #2 state in the U.S. in solar installations, the state lost one million acres of cropland to development and housing, yet only 1% of that total was due to solar development.[2] Moreover, many solar developments strengthen agricultural communities and augment local agricultural production.



Even as installations of utility-scale solar continue to expand, they still do not pose a significant risk to the loss of agricultural land. To generate enough electricity to power the entire country, solar facilities would need to occupy roughly the same area devoted to surface coal mining,[3] with a much cleaner outcome.

In Pennsylvania, the Department of Environmental Protection found that only 124 square miles (79,200 acres) of land will be needed to increase grid solar sufficiently to generate 10 percent of electricity.[4] This is less than three-tenths of 1 percent of Pennsylvania's total land area of 46,055 square miles. In addition, land that is already in use, such as landfills and abandoned mine land, could also host grid-scale solar installations.

Solar Allows Land to Recover

Land Area Needed to Power the U.S. with Solar PV

[1] https://www.agweek.com/business/agriculture/4443480-31-million-acres-lost-development-cuts-us-farmland
[2] North Carolina Sustainable Energy Assn, "North Carolina Solar & Agriculture" (April 2017). https://energync.org/wp-content/uploads/2017/04/NCSEA_NC_Solar_and_Agriculture_4_19.pdf.
[3] https://solar.gwu.edu/how-much-land-would-it-take-power-us-solar
[4] https://www.dep.pa.gov/Business/Energy/OfficeofPollutionPrevention/SolarFuture/Pages/Pennsylvania's-Solar-Future-Plan.aspx

Soil can be improved by planting native grasses/pollinators and effectively letting the soil rest. In the future, when a solar project is decommissioned, farming can once again resume on that land. This is a stark contrast to other development, which often leaves land unusable for agriculture.[5,6] After the panels are installed, native vegetation—often friendly to bees and other pollinators—is planted. The deep roots of the planted native vegetation retain more water than turf grass and gravel during heavy storms and periods of drought. They also help retain topsoil and improve soil health over time, even in "brownfield" areas with polluted soils.[7]

Solar Projects Provide Economic Benefits to the Farming Community

Solar paired with native grasses and pollinators can provide overused soil an opportunity to recover and a healthy revenue stream to farmers.

- Keeps farmers on their land
  - Solar lease payments tend to be higher than leasing for traditional agriculture operations.
  - Farming is an extremely low-margin, competitive industry. If a farmer can add solar to a portion of their property and get a long-term steady income, it can help them to keep their farm.
  - Steady income from solar projects means that farmers are less vulnerable to fluctuations in market prices or crop yields.
- Downstream benefits from O&M and tax revenue have lasting positive community impact
- Solar can offset power required for pumping and provide electricity to remote irrigation systems
- Provides substantial tax revenue to local communities.[8] Detailed data collection in NC shows local tax revenues up 2000% after the state's big solar build up through 2017.[9]
- Provides local construction jobs

NREL, Photos by Dennis Schroeder

Co-location of Agricultural Activities and Solar

Solar and agriculture are not mutually exclusive. In fact, the U.S. Government incentivizes co-locating solar with agricultural production. USDA's REAP program provides grants to those interested in investing in solar energy. However, to qualify, applicants must receive at least 50% of their income from agricultural operations.[10] Additionally, pollinators and sheep farmers are two examples of co-located agricultural activities that exist in harmony with solar projects.[11] According to a study, co-location and solar grazing bring net positive benefits for both farmers, in the form of additional income, and solar facilities, through increased energy production and reduced maintenance expenses. Please see SEIA's Multiuse Farming Factsheet for more information.

[5] https://www.nrel.gov/news/features/2019/beneath-solar-panels-the-seeds-of-opportunity-sprout.html
[6] https://www.energy.gov/eere/solar/farmers-guide-going-solar
[7] https://www.nrel.gov/news/features/2019/beneath-solar-panels-the-seeds-of-opportunity-sprout.html
[8] North Carolina Sustainable Energy Assn, "North Carolina Solar & Agriculture" (April 2017). https://energync.org/wp-content/uploads/2017/04/NCSEA_NC_Solar_and_Agriculture_4_19.pdf.
[9] https://energync.org/wp-content/uploads/2019/07/Small_Increased-NC-County-Tax-Revenue-from-Solar-Developmentv3.pdf
[10] https://www.rd.usda.gov/files/RD_FactSheet_RBS_REAP_RE_EE.pdf
[11] https://energync.org/wp-content/uploads/2017/04/NCSEA_NC_Solar_and_Agriculture_4_19.pdf