



American Solar Grazing Opportunities for U.S. Sheep Industry

Presented to
California Wool Growers Association
162nd Annual Meeting & Convention

August 20, 2022

By Nick Armentrout ©2022

Solar Grazing: using livestock as a tool to manage vegetation, and to improve soil health and function at solar arrays



2020 Craig Scariot, Sky Pilot Farm, CO

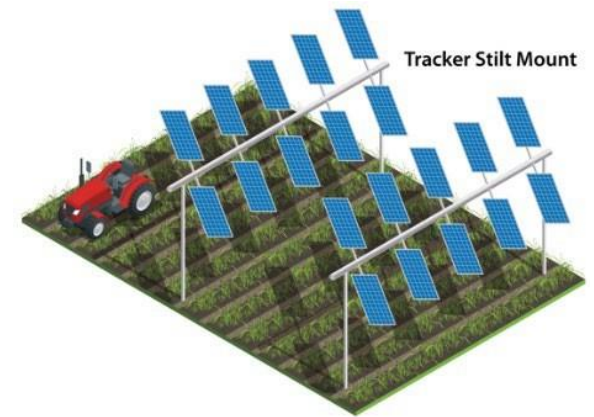
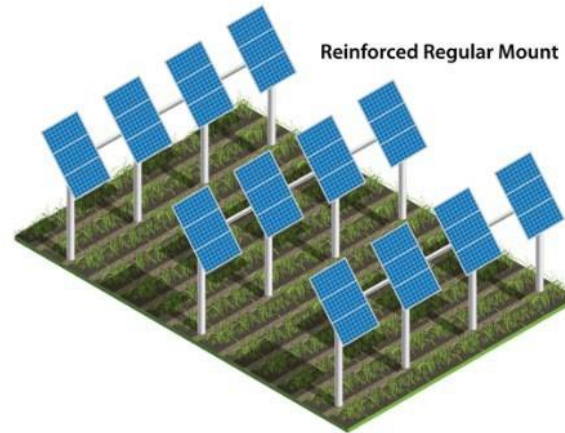
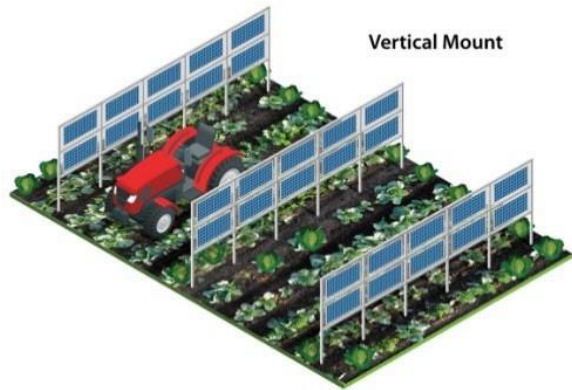
Solar Companies utilize grazing at solar facilities to keep vegetation from

- Shading the pv modules which reduces production
- Encroaching on rotating equipment and inhibiting function
- Allowing nuisance or noxious weeds to propagate
- Impacting worker safety by covering hazards and in some cases poisonous plant and animal species
- Reducing fire hazards at solar arrays
- Lowering maintenance costs as much as possible
- To maintain a clean & orderly site
- Minimize the carbon footprint associated with vegetation control at solar facility
- Increase soil organic matter over the life of the project
- Promote sustainability

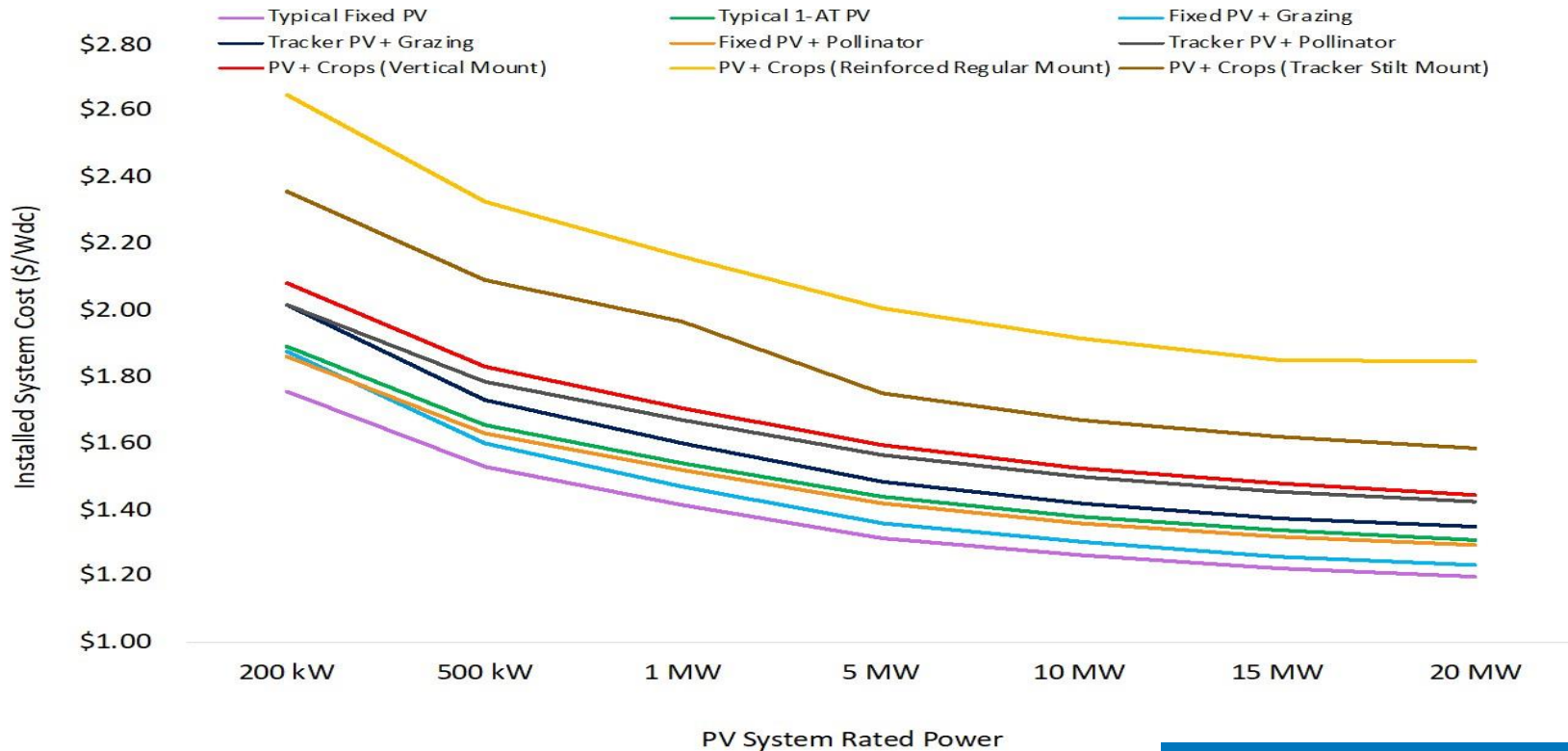


Source: PV Field Guide Vegetation Management, Acciona

“Agrivoltaics,” “Co-location” Dual-Use Scenarios



Dual-use system implementation costs



Potential for Sheep Industry Growth –
Wool too?



Operations & Maintenance - tough conditions for some crews, easy for others.



Grazing can be a superior management strategy for Cost Savings, Support for the Farm, the Regional Ag. Economy & Environment



Single axis tracker panels, drive shafts, utility scale site, PA



Fixed-tilt panels, low leading edge, DG site, ME

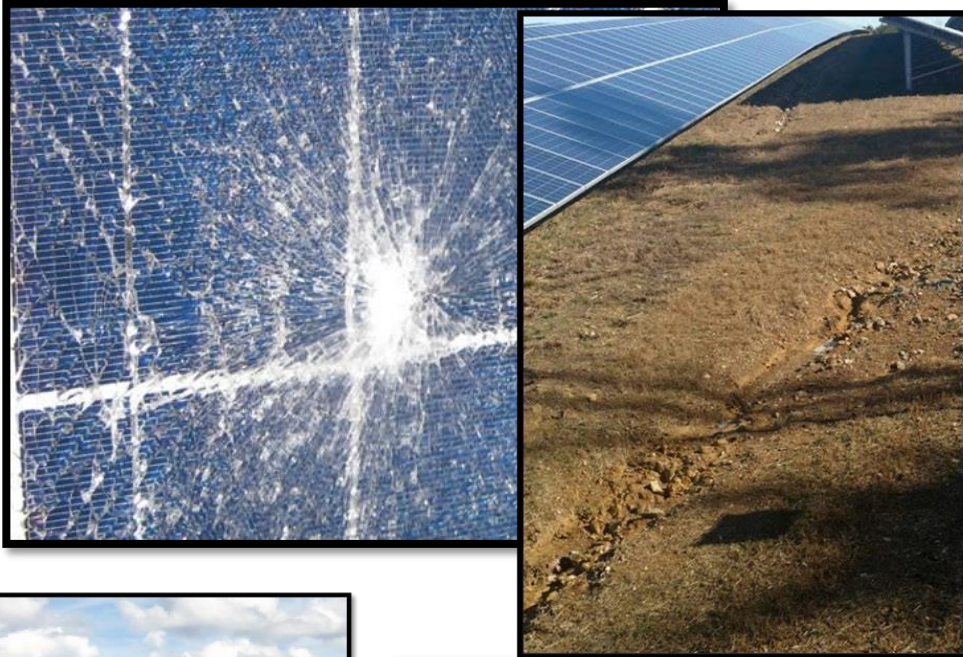
AgriSolar Clearinghouse: <https://www.agrisolarclearinghouse.org/>

American Farmland Trust: <https://farmland.org/project/smart-solar-siting-for-new-england/>

Institute for Energy and Environmental Research: www.ieer.org - Farming and Solar Synergies

Mount Morris New York Agrivoltaic Study: <https://solargrazing.org/resources/solar-grazing-budgets/>

Other management regimes



The Solar Grazing Opportunity: Paid Access to Fenced, Shaded Grasslands, and Corporate Partnership



Source: Craig Scariot, Sky Pilot Farm, CO



Source: Christian Stovall, Hidden Mt. Farm, MA



Lewis Fox, Agrivoltaic Solutions, VT



Source: Julie Bishop, Solar Sheep, LLC, NJ - Credit: Dan Charles, NPR

The American Solar Grazing Association Founded by Farmers to Promote Solar Grazing

www.solargrazing.org


Monthly Webinars
Member Network & Forum
Research & Outreach collaboration


- Solar Energy Industries Assoc. (SEIA)
- National Renewable Energy Laboratory (NREL)
- National Center for Appropriate Technology (NCAT)
- USDA/Cornell
- USDA-NRCS Extension Service



Search American Solar Grazing Association

Lewis Fox is going to this Event

 **Lexie Hain** • solar grazier



Today
5:00pm - 6:00pm


Zoom Meeting
Copy the Link


You're Going!
Change RSVP ▾


ASGA Teatime: Join Lewis Fox

Join us for ASGA Teatime: Live chat with Lewis Fox
Bring your tea and your questions, thoughts, or stories. RSVP to get the invitation reminder.
Lewis Fox is a founder of ASGA and a partner in...[CONTINUE](#)

Event Events Posted 1mo ago

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 **Chris Leonard** 3w Host
[Lewis Fox](#) Hows Pickle doing? She going to be in on the call?



American Solar Grazing Association

Founded by Farmers to Promote Solar Grazing

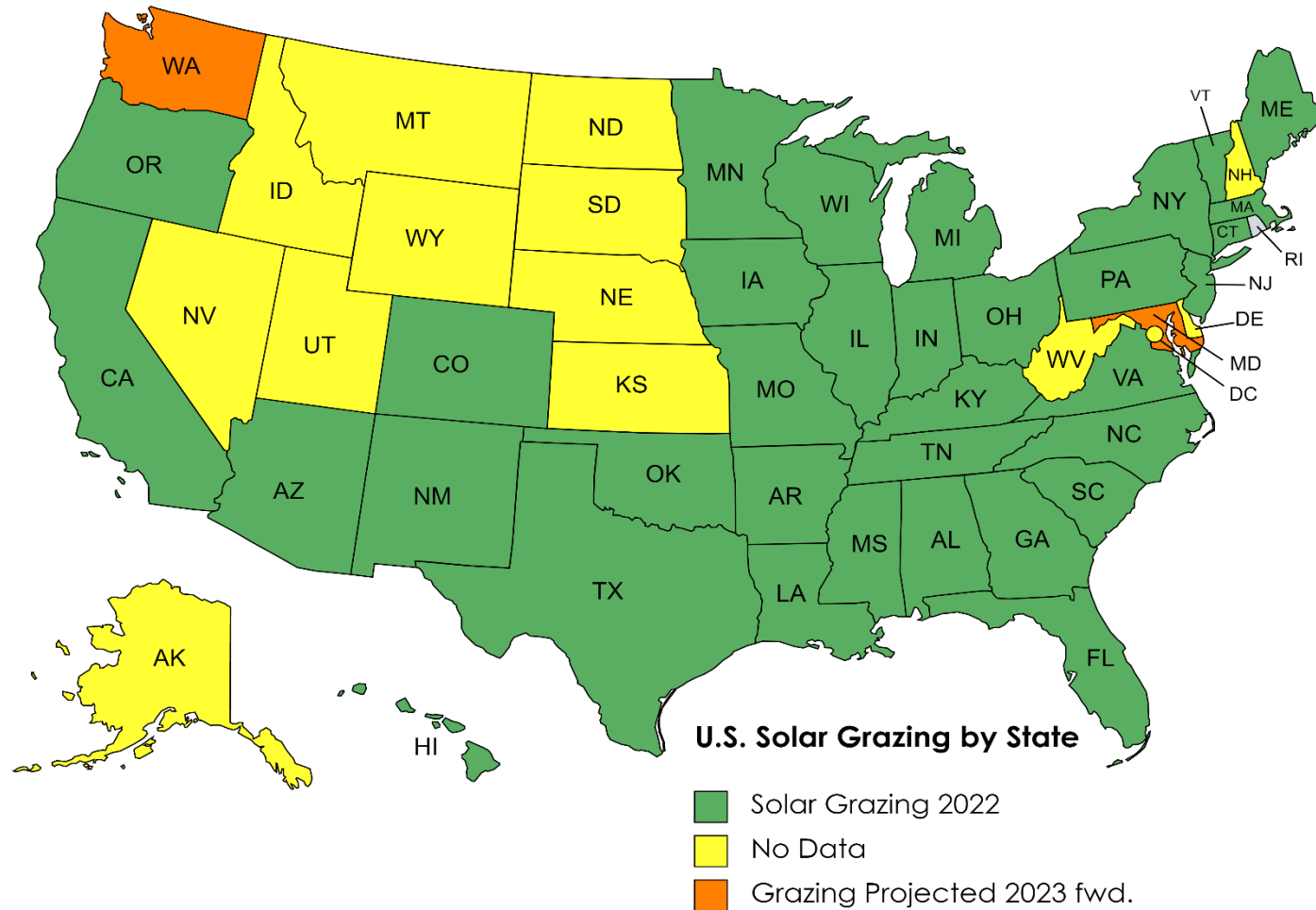
www.solargrazing.org

Develop Industry Tools & Identify Resources:

- Model contracts for solar grazing
- Solar Beekeeping contract 2021
- Solar Grazing budgeting tools
- Fuzz & Buzz Seed mixes
- Forage Testing
- Stocking rates and explanations
- Fact Sheets (outreach & education)
- University & Private Research



A growing branch of industry in high demand

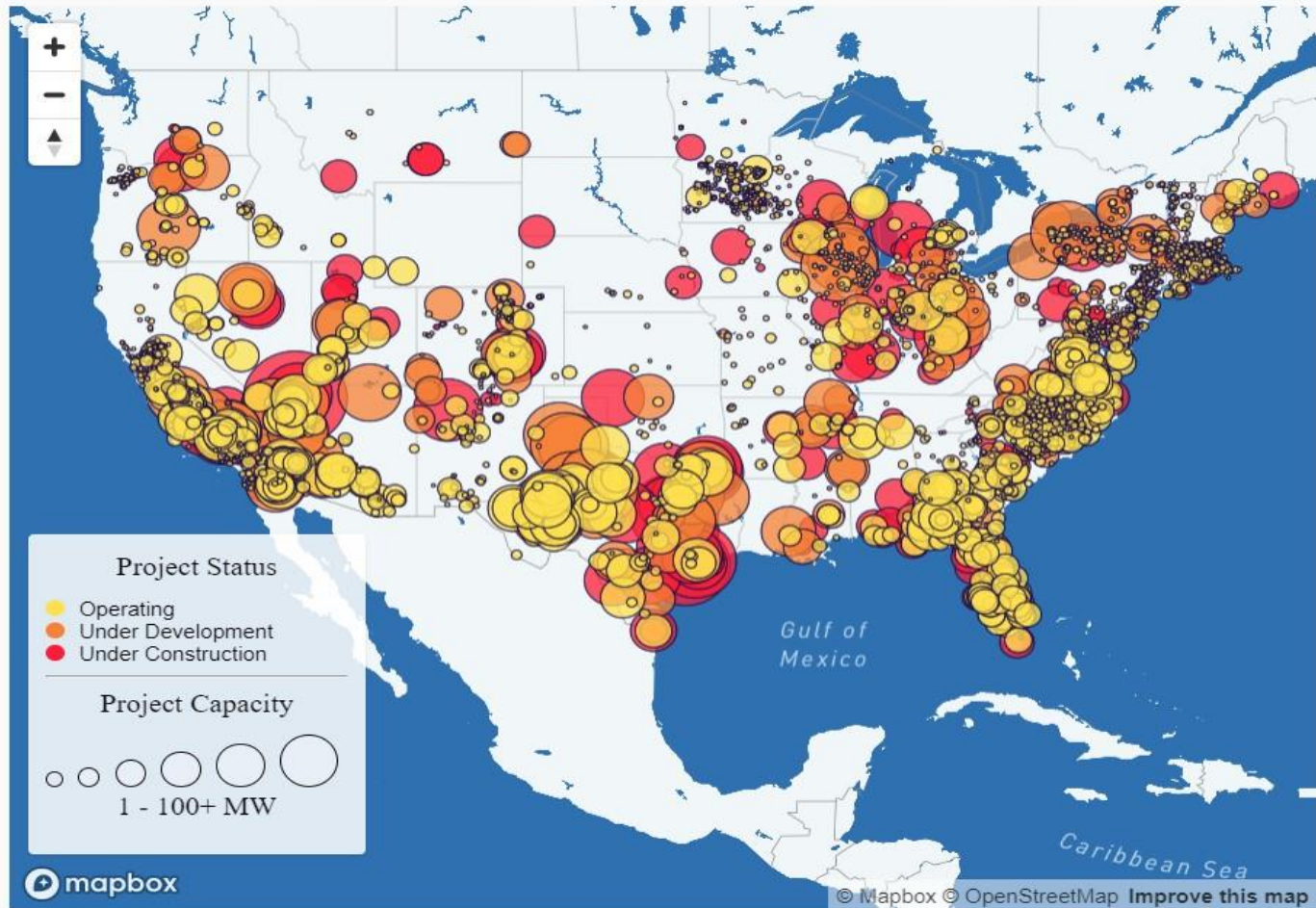


>400 Members & Subscriber Network of close to 900 and growing
31 U.S. States, Africa, Asia, Australia, and Europe
Farmers, Graziers, Researchers, Solar Firms, Landowners and Supporters

Created with mapchart.net

Project Location Map

See the locations of the major solar systems identified by this research on our interactive map.



The Solar Energy Industries Assoc. Major Projects List AUG2022

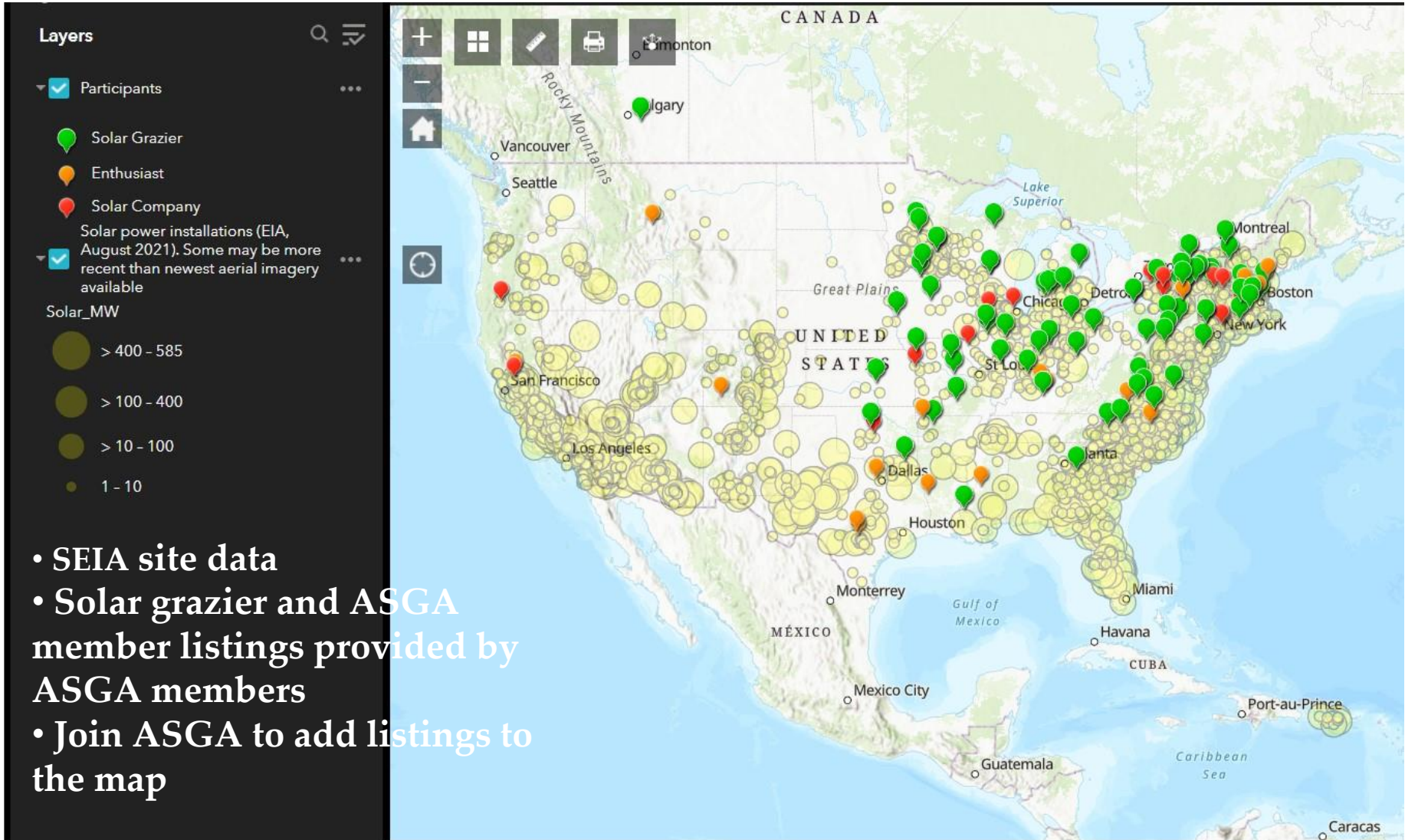
- Maintains a database of **ground-mount** solar projects 1 MW scale or larger, operating, under construction or in development.
- More than **5,600 major solar projects** currently in the database, representing **more than 155 GW_{dc} of capacity**.
- There are more than **560 major energy storage projects** currently in the database, representing **nearly 10,500 MWh of capacity**.
- The list shows that there are *nearly 84 GW of major solar projects currently operating.*
- There remains an enormous amount of capacity in the pipeline, with **more than 71 GW_{dc} of large-scale solar projects either under construction or under development**.
- *1 Gigawatt = 1000 Megawatt*
- *1 Megawatt requires approx. 6-7 acres of land space*
- *84 GW = 84,000 MW x 7 acres avg. = 588,000 acres x ___ sheep/acre.*
- *As of Jan. 1, 2022, there were 5.07 million head of sheep in the U.S.²*
- **We need more sheep!**

And Shepherds, and Shearers, and Processors, and...

Source: <https://seia.org/research-resources/major-solar-projects-list>

² Source: USDA, NASS, Sheep & Goats, Jan. 31, 2022.

Solar Grazing Map



<https://solargrazing.org/map/>

Lightsource bp operational site, Penn State Solar Facility, St. Franklin County, PA. Approx. 105 acres leased, private land— one of 3 sites, >500-acres, providing 70 MW to Penn State Univ.



EDF Renewables proposed 350 MW Ridge View Solar Facility. Leased, private land in Town of Heartland, Niagara County, New York

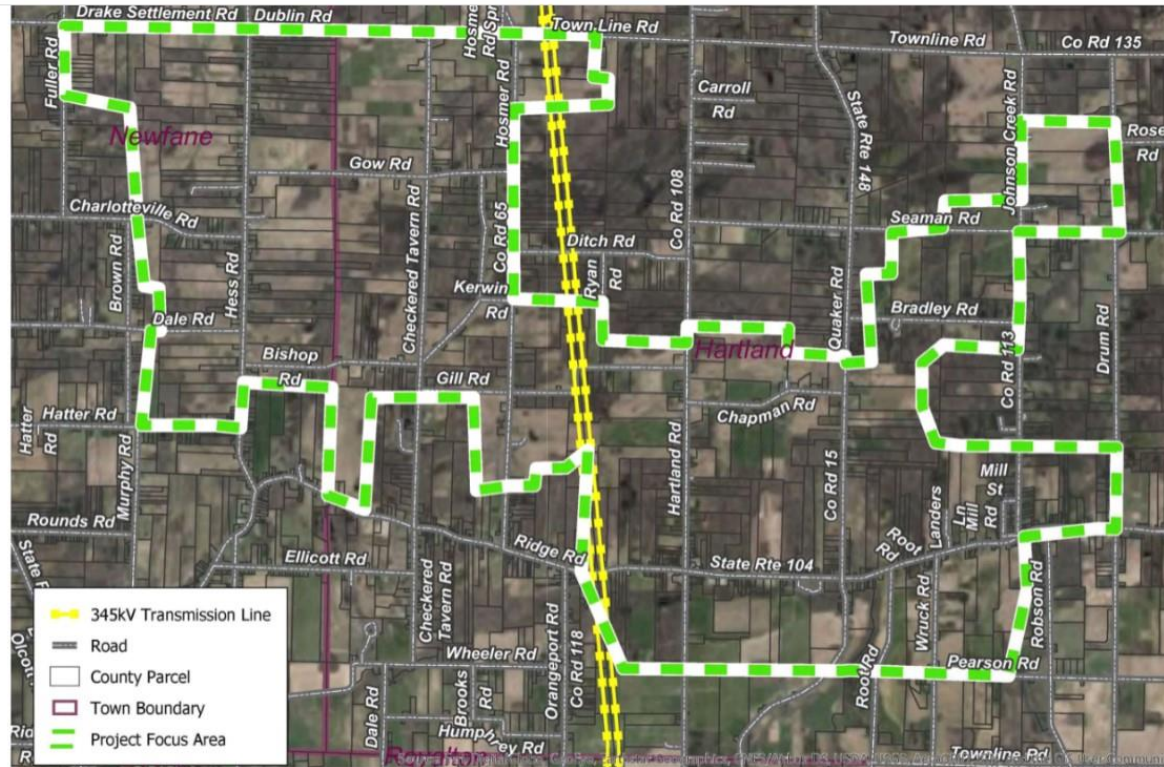
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RIDGE VIEW
solar energy center

PROJECT FOCUS AREA

- Targeting ~2,000 acres of privately owned land within the Project Focus Area in the Towns of Hartland and Newfane

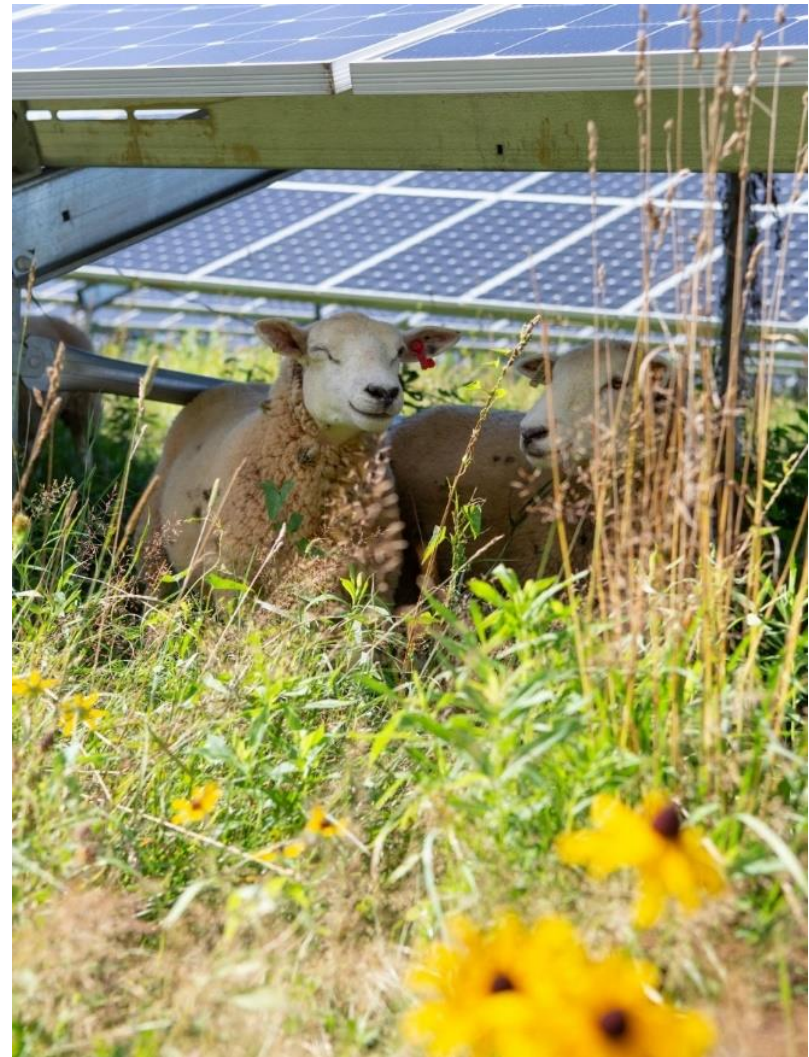




ASGA

AMERICAN SOLAR GRAZING ASSOCIATION

www.solargrazing.org



Thank you

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Grazing business income and expenses

 **PER ACRE, PER YEAR**



Per acre income and expense of solar grazing in New York and across the eastern United States.

Eastern United States	Directly contracted	Subcontracted
Income	\$326	\$308
Expenses	\$64	\$64
Net	\$262	\$244

New York State	Directly contracted	Subcontracted
Income	\$555	\$320
Expenses	\$46	\$46
Net	\$509	\$274