Agrivoltaics presents a pathway to achieve our clean energy goals, while preserving production in agricultural lands.

- Ambitious climate action goals established by New York and other states rely on solar energy development, which often occurs on farmland.
- Some stakeholders have raised concerns about potential impacts on agriculture.
- The need to rapidly deploy solar energy while maintaining agricultural production represents an opportunity for agrivoltaics.
- For this opportunity to be met, the costs associated with agrivoltaics must be addressed through research, sound policy, and incentives.

Agrivoltaics: Framing the Opportunity

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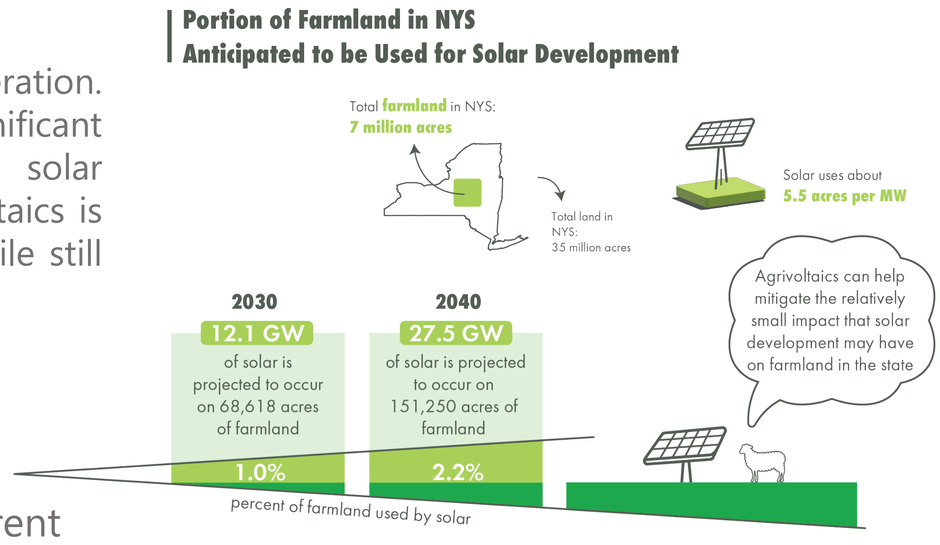
Introduction

Agrivoltaics is the use of land for both agricultural production and solar energy generation. New York and many other states have ambitious climate action goals that rely on significant solar energy development. For a variety of economic and ecologic reasons, solar development often occurs on farmland (see New York example to the right). Agrivoltaics is one potential tool to support rural economies and keep farmland in production, while still providing affordable renewable energy to ratepayers.



Methods and Results

EDR and ACENY worked with solar energy developers in the northeast to compile the costs and benefits of various agrivoltaic practices based on current research and industry experience. We found that agrivoltaic practices generally fall into two categories:

- **Conventional** agrivoltaic practices can be relatively easy to implement, but often require contracted external producers and result in limited agricultural income potential.
- **Emerging** agrivoltaic practices require extensive planning and high upfront costs and have not been as thoroughly studied as conventional practices. However, these practices may allow farmers to continue to utilize their land during operations and largely mitigate the agricultural impacts of solar energy development.

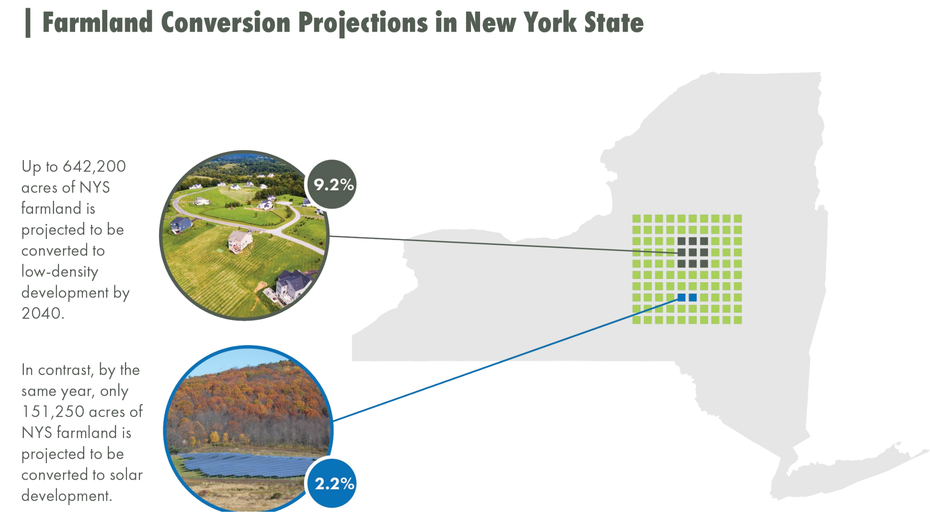
Agrivoltaic Practice	Relative Cost	Relative Agricultural Impact Mitigation Benefit	Potential Siting and Design Requirements
Conventional			
Sheep Grazing	Low to Moderate	Low to Moderate	Optimize design of the security fence, gating, and other components to support livestock access and movement. Install grazing-appropriate seed mixes and watering facilities, as needed.
Apiculture	Low	Low	Install pollinating seed mixes. Provide access and laydown areas for apiaries.
Emerging			
Cattle Grazing	Moderate to High	Moderate	Modify and reinforce overall design to be compatible with cattle grazing (e.g., increase panel height, reinforce equipment, and protect cables).
Row and Field Crop Production	High	High	Increase panel spacing and/or pile reveal heights, modify panel layout, tracking or tilt angles, implement alternative cable management practices, or otherwise modify the design to facilitate equipment use and access. Increase cable burial depths, install irrigation, or utilize emerging technologies (e.g., semi-transparent panels) to facilitate cultivation and production between and under the panels.

Discussion and Conclusion

To decarbonize the grid, the United States will need to dedicate approximately 10 million acres of land to solar development (DoE, 2021), approximately 2-4% of this solar development will occur in New York. Although solar projects are often sited on farmland, solar energy development is notionally a temporary land use, and its impacts can be partially or wholly mitigated through following agricultural best management practices during construction and implementing agrivoltaics during operations. When compared to other forms of land use (e.g., low-density development) the impacts of solar energy development are less expansive and less permanent (see New York example to the right).

The opportunity presented by agrivoltaics to help mitigate the effects of solar development can be realized through **research**, sound **policy**, and **incentives**, including:

- Working with researchers to develop scalable agrivoltaic practices that are transferable from smaller test sites to utility-scale solar projects.
- Promoting agrivoltaic operations that are adaptable to the complexities of agriculture.
- Safeguarding against cost increases to keep electricity prices affordable.



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