#### **DISCOVER CALS**

# Global Development

Implications of Large Solar Installations and Leasing on Farmland

> David Kay, Senior Extension Associate dlk2@cornell.edu

Cornell Climate Smart Farming Program 2021 Webinar February 12, 2021



# NYS POLICY



# Net metering – on farm generation

Net metering allows farmers with onsite solar panels "to offset their utility electricity bill"

## Net metering: maximum size

- Solar: 25 kW for residential, 100 kW for farms, 2 MW for non-residential
- Wind: 25 kW for residential, 500 kW for farm-based, and 2 MW for non-residential
- Biogas: 2 MW (farm-based only)

See https://programs.dsireusa.org/system/program/detail/453/net-metering



# **RECENT NYS CLIMATE CHANGE POLICY MAJOR NEW LEGISLATION**

- Climate Leadership and Community Protection Act
  - > Governs overall decarbonization of the economy
- The Accelerated Renewable Energy Growth and **Community Benefit Act** 
  - > Establishes new rules for siting electricity generating facilities

#### Policy already in place

#### Buildings

#### New Efficiency: New York

- Carbon Neutral Buildings Roadmap
- Leadership by Example

#### BuildSmart (EO88)

EO166

#### Transportation

- EVolveNY
- Charge Ready NY
- Drive Clean Rebate
- Municipal Clean Vehicle Rebates

#### Resilience

> Community Risk and **Resiliency Act** > Resilient New York

#### Electricity

#### > Regional Greenhouse Gas

#### Local Governments > Climate Smart Communities

> Clean Energy Communities

#### Short-Lived **Climate Pollutants**

... and more

- > Methane Reduction Plan
- > Clean Energy Standard
- > NY-Sun

Initiative

- > HFC Reduction Strategy
- > Offshore Wind
- > Energy Storage

# Focusing on solar electricity generation



# Solar in New York: metrics





# NY SUN Projects (NYS supported)

Cumulative installed: 2,071 *MW* "In pipeline": 2,080 *MW* 114,716 projects (2000- Nov 2020) *240 (0.2%) of these 5-10 MW* 

NYSERDA staff says: "Distributed solar" = 5 MW or less

Lots of "distributed" projects
Residential location follows population

~4.2 GW total,
here or on the way



#### APRIL 21, 2020

Wind and natural gas-fired generators led U.S. power sector capacity additions in 2019

U.S. electric generating capacity additions (2019) megawatts (MW) natural gas other wind solar U.S. total 23.328 3.464 West South 10.326 Northeast 4.413 Midwest 5.125 eia 25.000 20.000 5.000 10.000 15.000 mation Administration, Preliminary Monthly Electric Generator Inventory Source:

How much solar electric does the state need?

# Vall Stre Owntown & The market will decide

#### NY SUN ~4 GW total already here or on the way

Guesstimate: ~ 23 GW solar

# ~19 GW more than NY SUN's 4 GW

https://pv-magazine-usa.com/2019/06/20/new-york-state-is-goingto-need-15-gw-of-solar-power/

#### Figure 7 - Utility-Scale Solar PV Potential Sites by Size Categories



http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7bDCA9763C-D2DA-4FD1-9801-D859E7ED8FE3%7d

Figure 4 - Land-based Wind LCOE Supply Curve



### Figure 8 - Utility-Scale Solar PV LCOE Supply Curve



http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7bDCA9763C-D2DA-4FD1-9801-D859E7ED8FE3%7d

# **Electricity Supply**

- + New York State has significant potential renewable energy resources and zero-carbon technology options, as well as access to adjoining states, provinces, and regional transmission systems, which offer additional options for energy supply.
- + Significant in-state renewable development will require careful siting considerations



Energy+Environmental Economics

# Projects in the NYISO "Queue"

NYISO governs interconnection to the electric grid Officially proposed projects are assigned a position in the queue





# Solar Projects in NYISO Queue by Size Number and MW of Projects



# Projects in Article 10 review (25 MW+)... ... and now ORES review

# 20-25 MW facilities and larger

Article 10: Solar Projects under Review

Plus... under ORES review Solar: 2 (0.2 GW) (4 more pending transfer from Art. 10)

# **Projects Under Review**

Step 1: Public Involvement Program Submittals	18	Projects, 3.7 GW
Step 2: Preliminary Scoping Statement Submittals	9	Projects, 1.5 GW
Step 3: Applications Submitted	3	Projects, 0.5 GW
Step 4: Applications Deemed Compliant	1	Projects, 0.1 GW
Step 5: Applications Approved	4	Projects, 0.3 GW
Step 6: Certified Projects	3	Projects, 0.2 GW

https://www3.dps.ny.gov/W/PSCWeb.nsf/All/14359 5FA3BE36AEA852579D00068B454 About 6.2 GW total



# A Sense of Scale

Livingston County = 640 mi sq Town of Mt. Morris = 50 sq mi

Acreage in project boundary shown ~ 24 sq mi

- "Facility will ultimately be sited on approx. 1,000 acres [~1.6. sq mi.] of leased private land within the Facility Area, which consists primarily of cleared land."
- 1000 acres implies 5.7 acres/MW

Agricultural land Within Boundary

23% of parcels
65% of acreage
72% of assessed land value
45% of assessed land + building value



What categories of **land cover** are within proposed Article 10 project boundaries?



40 active projects analyzed

Soils within the boundaries of 40 Article 10 projects under review

Prime farmland, 21% Prime farmland if drained. 25% Not prime farmland, 23% Farmland of statewide importance, 31%

Note: Analysis of "land cover" (satellite data) is similar: 48% agriculture, forest 33%, woody wetland 12% NYS Agricultural land "under" solar: What's a "small" fraction of farmland???



40 Article 10 projects account for 6.5 GW capacity in 28 counties

1.8% of all soils with agricultural potential in the 28 counties hosting projects 1.4% of **prime** farmland soils in those counties

3 \* 6.5 GW capacity 20 GW capacity (~projected need?)

~ 6% of all soils with agricultural potential (28 counties only) ~ **4% of prime farmland soils (28 counties only)** 

# What if we need 50 GW?

- ~ 15% of all soils with agricultural potential (28 counties only)
- ~ 10% of prime farmland soils (28 counties only)



NYS Agricultural land "under" solar: What's a "small" fraction of farmland???



[3 \* 6.5 GW capacity  $\longrightarrow$  ~ 20-50 GW capacity (~projected need?)]

Figure 8 - Utility-Scale Solar PV LCOE Supply Curve



Or maybe closer to 2 GW capacity from solar????

#### @ 5 acres per MW:

- 50 GW needs 250,000
- 20 GW needs 100,000 acres
- 2 GW needs 10,000 acres

Or if as much as 10 acres per MW:

- 50 GW needs 500,000 acres
- 20 GW needs 200,000 acres
- 2 GW needs 20,000 acres



Is 10,000 acres a little or a lot?

Is 500,000 acres a little or a lot?



# NYS Agricultural land "under" solar: What's a meaningful context? Local? Regional? Statewide?





## STATEWIDE:

- 6.9 million acres land in farms, 2018 Ag Census
- 9.2 million acres of "ag land use" (incl. 4.6 million in crops, 2.3 in pasture), AFT estimate
  - about 5 million acres of "high quality agricultural land"
- Compare to other forms of farmland loss
  - 253,500 acres of farmland were permanently converted over 15 years, or ~17,000 acres per year on average.
    - Of that, 128,300 is in AFT's Nationally Significant farmland class, a conversion of about 8,600 acres per year.

# COUNTIES:

6.9 million acres 118,703 acres, 57 county mean 114,922 acres, 57 county median 2018 Ag Census land in farms



Is 10,000 acres a little or a lot? Is 500,000 acres a little or a lot?







# Co-Location of Agriculture and Solar: Opportunities to Improve Energy, Food, and Water Resources





What crops grow well under solar panels?

What crops can be grown under solar panels economically?

What kinds of famers would do this?

What makes sense for a solar company?

Where do different crop/solar design interactions work well?



### Grazing Sheep on Solar Sites in New York State: Opportunities and Challenges





https://blogs.cornell.edu/grazing/home-2/solar-grazing-project/



Nikola Kochendoerfer and Michael L. Thonney Department of Animal Science, Cornell University, Ithaca, NY 14850, USA February 2021

### Grazing Experiment at Cornell University

"Preliminary data show that the management of flocks of up to 150 ewes (yearly stocking rate of 3 sheep per acre) is feasible and provides a realistic prospect for job creation and ample opportunities for new and beginning sheep farmers, as well as ecosystem services"

#### Smaller facilities (1 to 20 MW on 6 to 120 acres) v. Larger facilities (> 20 MW, > 120 acres)

- Context
- Opportunity
- Benefits
- Challenges
- Barriers

SUMMARY: Solar grazing provides an opportunity for growth of the NY sheep industry. Expansion of related services and businesses are needed to support the numerous benefits of this emerging industry

# New USDA Solar Leasing Project

# **Project Goals**

- Develop legal guidance for solar energy leases for large installations on farmland
- Profile relevant laws & policy in NY, MD and OK
- Use leasing data to assess equity, economic and environmental implications of solar energy development







# Advice from Attorney Paul Goeringer about leases



My major point is almost always to read it.

- If you don't understand it, ask questions to better understand it
- Always get an outside opinion on it (trust but verify).

### Understand the lease:

- how will it impact current uses?
- how long it will last?
- what are your obligations?
- how do you get paid?
- what happens when the project ends?

Landowners should consider asking an attorney to carefully examine the land lease terms.!

Landowner Considerations for Solar Land Leases

Identifying key questions and potential impacts of leasing land for solar projects.



Section Contents **1. Community Solar** 2. Solar For Your Land 2.1 Per Acre Lease Rates **3. Agricultural Assessments For Your Property** 3.1 Conversion penalty 3.2 Solar Panels and Taxes 3.3 Exemptions from School, County, Town, and Village Taxes 4. Other Potential Impacts 4.1 Responsibility of Dismantling Solar Arrays 4.2 Selecting your Solar Array Location 4.3 Local Solar Laws in your Community

https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjC4tGI7uLuAhUNnOAKHSbuDtEQFjAA egQIBRAC&url=https%3A%2F%2Fwww.nyserda.ny.gov%2F-%2Fmedia%2FNYSun%2Ffiles%2FLand-leaseconsiderations.pdf&usg=AOvVaw1zhmDjo-V\_UHYtkI7V-LfV



### NEW YORK STATE DEPARTMENT OF AGRICULTURE AND MARKETS

Guidelines for Agricultural Mitigation for Solar Energy Projects

https://farmlandinfo.org/law/new-york-department-of-agriculture-marketsguidelines-for-agricultural-mitigation-for-solar-energy-projects/

#### Consult an attorney prior to signing a lease!



Leasing Your Farmland For Wind & Solar Energy Development

A Beginner's Guide for Farmers

NYFB Legal Affairs Department • 159 Wolf Rd., PO Box 5330, Albany, NY 12205 1-800-342-4143 • http://www.nyfb.org

- Continued Use of the Land for Farming, Hunting, Other
- Insurance
- Location of the Renewable Energy Facilities
- Rights-of-Way and Easements
- Farm Buildings
- Tax Implications
- Construction
- Dismantling the Facility
- Utilities
- Audit Privileges
- Zoning and Planning Board Approval
- Exclusivity
- Selling Your Property

http://www.nyfb.org/application/files/2014/9780/6349/file\_y349d211hx.pdf



#### Questions to Ask a Solar Developer

- Have you completed similar solar projects in my state?
- What land will be leased?
- What is the effect on non-leased land?
- How long does the term run?
- How is rent calculated?
- Who pays for taxes and other expenses?
- What if the land is mortgaged?
- What protections might the solar developer's lender want?
- What happens to the developer's improvements?
- Who will maintain the land?
- What rights (if any) should there be to water, minerals and other natural resources?
- Whom should I contact if I have questions about the lease, especially following the installation?



#### Farmland Owner's Guide to

# **Solar Leasing**

Peggy Kirk Hall, Evin Bachelor and Eric Romich Ohio State University Extension



#### Chapter 1 Solar Energy Development in Ohio Chapter 2 Solar & Your Land: Initial Considerations

- 2.1 Length of the commitment 2.2 Who has legal interests in the land? 2.3 Impacts on the farm and land 2.4 Family matters 2.5 Property taxes 2.6 Government programs 2.7 Liability and insurance 2.8 Neighbor and community relations 2.9 Who is the developer? 2.10 Professionals who can help you **Chapter 3 Common Legal Documents in Solar** 3.1 Letter of intent 3.2 Option to lease 3.3 Solar lease **Chapter 4 The Solar Lease** 4.1 The life cycle of a solar lease
- 4.2 Common solar lease terms

**Chapter 5 The Farmland Owner's Leasing Checklist** 

#### Leasing Checklist

- Accurate description of the property and parties
- The term of each lease period, when each period begins and ends, and the total length of the lease
- Whether renewal is permitted, how to renew, and length of renewal periods
- Rental payments, inflation adjustments, and how each will be calculated
- Whether farming and similar activities can continue prior to construction of the facility
- Who pays for penalties for withdrawal of land from CAUV and government programs and termination of farmland leases
- How to deal with existing mortgages
- How damages to crops, improvements and drainage will be addressed
- The types and extent of easements granted
- Obligations of the landowner, such as non-interference and confidentiality requirements
- Post-construction clean up obligations
- Limitations on owner improvements, eg. buildings, fences and tree plantings
- Responsibility for maintaining vegetation, access points, driveways and fences
- What happens if either party terminates early
- Cleanup and restoration of the property at lease end, including funds
- Landowner's hunting and recreation rights
- Potential interferences with mineral rights
- Indemnity and insurance provisions
- How conflicts will be resolved
- How weather and acts of God affect obligations
- Handling of proceeds from eminent domain actions
- Payment of attorney fees if disputes arise

https://farmoffice.osu.edu/sites/aglaw/files/site-library/Farmland\_Owner%27s\_Guide\_to\_Solar\_Leasing.pdf

# Penn State Webinars

https://extension.psu.edu/solar-leasing-for-landowners

#### Solar Leasing for Landowners

An extension educator in energy and an attorney from the Penn State Agricultural Law Center will discuss the economics, land use ssues, and legal issues that landowners may wish to consider in making the best deal for their land.

Beginner

English

WBN-G-1422 | BE THE FIRST TO LEAVE A REVIEW



#### SKILL LEVEL: RECORDED WEBINARS 1 hour, 30 minutes LANGUAGE

"Letter of Intent" type document – may be 1-page form (may want you to sign for the confidentiality clause) Option Agreement – approx. 10-15 pages

Solar Leasing for Landown... V

# FREE

WATCH NOW G SAVE FOR LATER

To Prostingto Extension

#### Timeline of the Lease Term

 Option Effective Date (signature on Option Agreement) Option Phase

Lease Effective Date (signature on Lease Agreement)

- ·Construction Phase (the build out)
- Operational Phase (energy generation)

Renewals (if any)

Cleanup Phase (removal and restoration)

Termination Date

#### Maintenance/use of property

 Make sure maintenance is spelled out. Do you want control over how/what herbicides/pesticides/fungicides are being used? o Do you want control of what cover is grown on the leased area?

 Do you need access to the leased area? Normally a leased premise is under in the tenant's exclusive possession.

 Should the tenant contribute to maintenance of any shared acreage over which the tenant possesses an easement?

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#### Maintenance Activities

Panel cleaning

Thermographic testing for wire faults

Inspections

Inverter maintenance

 Spraying and mowing for vegetation control (spraying will not likely be "everything," but around fences and hard to mow areas?)

Penalitate Extension

#### Termination, Removal & Restoration

 Acres of panels – remove within days of termination or ownership reverts to landowner and tenant must indemnify for cost of removal.

Restoration of land – include your specifications

Escrowed funds for removal? – if you can negotiate

Early Termination, bankruptcy, etc.

. Negotiate term that a bankruptcy is an event of termination by tenant and automatic obligation to remove within days. Try for some definitive outcome that does not require court approval.

·Tenant Identity Change - several times over the years Appurtenant Easements, Operations, Facilities ·Removal & Restoration is extensive and far in future Property Tax obligation sharing is on-going

impact the use of the leased premises/acreage.

The tenant has long-term possessory needs

collateral

Anatomy of the Transaction

**Common Terms & Conditions** 

Construction Easement – temporary

·Solar Easement - access to the sun

Lease Agreement – approx. 40-60 pages

 Access Easement – for routine access during lease term •Transmission Easement - for transmitting power to grid

 Nuisance Easement – for tenant's impacts on your remaining lands from day-to-day power generation activities.

What makes this different than some leases?

·It will be recorded and the tenant needs it to be superior to most

recorded "liens" or other recorded documents which can potentially

. The tenant has the need to offer the income stream and structures as

But you can't sign the Option without also negotiating the full Lease in its entirety. So all the hard work from Landowner end is up front.

•At least 2-part, sometimes 3:

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DISCOVER CALS

# Global Development

# Thank you!

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