Regional Agronomic Impact from Solar Energy—Phase 1 Final Report

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NEW YORK STATE
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New York State Energy Research and Development Authority

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Our Vision:

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Regional Agronomic Impact from Solar Energy—Phase 1 Final Report

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Abstract

This report supplements ongoing research on the potential benefits and impacts of solar development on New York State's agricultural economy. The report outlines the results of land-use analyses, literature review, and interviews to advance understanding of historical agricultural land-use change and the potential economic impacts of converting active agricultural land to solar development for the State's farmers, farming communities, and the associated agricultural value chain. In conjunction with additional State efforts to understand the land-use implications of large-scale solar development, results inform potential future actions on the siting process of major renewable energy facilities and on minimizing the impact of siting on the State's agricultural economy.

Keywords

solar, agriculture, agricultural land conversion, agrivoltaics, co-utilization, dual use, renewable energy development

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Table of Contents

List of Figures

List of Tables

Acronyms and Abbreviations

ACUP	Agricultural Co-Utilization Plan
AFPB	Agricultural and Farmland Protection Board
AFT	American Farmland Trust
AGM	New York State Department of Agriculture and Markets
A-TWG	New York State Agricultural Technical Working Group
Central Hudson	Central Hudson Gas & Electric Corp.
CGPP	Coordinated Grid Planning Process
Climate Act	Climate Leadership and Community Protection Act
Con Edison	Consolidated Edison, Inc.
CSBs	Crop Sequence Boundaries
DEC	New York State Department of Environmental Conservation
FTE	full-time employment
GDP	gross domestic product
HCAs	host community agreements
HCBP	Host Community Benefit Program
IEEE	Institute of Electrical and Electronics Engineers
IMPLAN	Impact Analysis for Planning
JEDI PV	Jobs and Economic Development Index Solar Photovoltaics
LDR	Low-Density Residential
LSR	large-scale renewable
LSSPV	large-scale solar photovoltaic
MSG	Mineral Soil Groups
NASS	National Agricultural Statistics Service
NGOs	nongovernmental organizations
NLCD	National Land Cover Database
NREL	National Renewable Energy Laboratory
NYCA	New York Control Area
NYISO	New York Independent System Operator

NYPAD	New York Protected Areas Database
NYS	New York State
NYSEG	New York State Gas & Electric
NYSERDA	New York State Energy Research and Development Authority
O&R	Orange & Rockland Utilities, Inc.
ORES	New York State Office of Renewable Energy Siting and Electric Transmission
PILOT	Payment in Lieu of Taxes
POI	point of interconnection
PSC	New York State Public Service Commission
PSEG	Public Service Enterprise Group
PSEG–LI	Public Service Enterprise Group–Long Island
PV	photovoltaic
RAISE Committee	Regional Agronomic Impact from Solar Energy Committee
RAPID Act	Renewable Action through Project Interconnection and Deployment Act
REDC	Regional Economic Development Councils
RG&E	Rochester Gas & Electric
RPTL	Real Property Tax Law
SEIA	Solar Energy Industries Association
SIR	Standardized Interconnection Requirements
SRP	Shared Renewables Program
UHD	urban and highly developed
USDA	U.S. Department of Agriculture
USPVDB	U.S. Large-Scale Solar Photovoltaic Database

Symbols and Units of Measurements

~	approximately
<	less than
>	greater than
≤	less than or equal to
≥	greater than or equal to
GW	gigawatts
kV	kilovolt
kWac	kilowatt of alternating current electric energy capacity
MW	megawatt
MWac	megawatt of alternating current electric energy capacity
MWdc	megawatt of direct current electric energy capacity

Summary

The New York State Energy Research and Development Authority (NYSERDA) commissioned this report to aggregate findings from a Phase 1 exploration of the land use and economic implications of solar energy development on New York State's agricultural industry. Phase 1 represents the cumulative results of literature review, interviews, and land use analyses performed with consultation and guidance from the Regional Agronomic Impact from Solar Energy Specialist Committee (RAISE Committee) of the New York State Agricultural Technical Working Group (A-TWG), an independent advisory body convened to advise New York State on interactions between renewable energy development and agricultural lands and operations. Through individual interviews and participation in the RAISE Committee, farmers, agribusiness representatives, solar developers, academic advisors, State agency representatives, and other key stakeholders informed the report's focus and content.

This report responds to a recommendation of the New York State Farmland Protection Working Group in its *2022 Interim Report*, which called for a study "to determine the potential benefits and/or burdens of renewable energy development related to New York's agricultural industry [and] assess the impact of solar project proliferation and the associated economic and productivity impact on the agricultural sector" (AGM 2022a, p. 24). As a first step to address that question, this Phase 1 effort provides foundational analysis to:

1. Characterize land-use implications of solar development to date in the context of broader agricultural land development pressures
2. Evaluate potential future implications of solar development on agricultural lands and economies under specific high-impact scenarios
3. Outline available information on the potential economic impacts and benefits of solar development to agricultural communities

This phase does not answer—and future analyses should address—significant remaining questions, including regarding the role agrivoltaics can play in maintaining agricultural activities and supporting the agricultural economy, where and at what scales solar development is most likely to occur, and the potential for regional agronomic impacts from solar and/or other forms of agricultural land use change.

This report is divided into four main sections: Section 1, Introduction; Section 2, Land-Use Analysis; Section 3, Impacts and Benefits of Solar Development on the Agricultural Economy; and Section 4, Preliminary Key Takeaways. Brief summaries of each section are provided below.

Section 1, Introduction, provides key information to understand New York State's solar energy and agricultural context. Agriculture is an important part of New York State's economy, contributing $2.7 billion to the State's gross domestic product in 2022 and representing 2.1% of total State employment. Dairy represents the largest agricultural industry in the State, utilizing 28% of the State's 6.5 million acres of farmland. Based on the 2022 New York State Census of Agriculture, the total acreage of land in farms decreased by 9% since 2012, driven by economic pressures, farm consolidation, and conversion of farmland to other uses. Solar energy development in the State increased steadily between 2016 and 2024, shifting from primarily rooftop installations to larger, ground-mounted community-scale projects, and increasingly incorporating utility-scale projects. Solar installations dipped in 2025, and statewide installed capacity now totals roughly 8,000 MW (SEIA 2026b). In its core planning scenario for meeting energy needs through 2040, the 2025 State Energy Plan outlines the techno-economic potential to deploy an additional 24 GW of solar by 2040, a significant portion of which is expected to be ground-mounted community- or utility-scale solar projects (New York State Energy Planning Board 2025). Solar projects in New York State operate within a regulated framework that includes State-level oversight, environmental review, agricultural mitigation standards, and local land use controls.

Section 2, Land Use Analysis, includes analyses of historical and prospective patterns for agricultural land-use change to contextualize the role of solar development. Solar interconnection queue data was analyzed to evaluate potential solar development at the county scale.

Between 2000 and 2021, the primary driver of agricultural land loss was its transition to shrubland, forest, and other nondeveloped land uses. Human development of agricultural land (such as urban expansion or suburban "sprawl") averaged about 3,600 acres per year over the same span. Between 2011 and 2025, an estimated 20,066 acres of solar development ≥1 MWac were built statewide, based on a review of New York Independent System Operator (NYISO) and NYSERDA data.

A subset of 7,812 acres of solar facilities constructed between 2017 and 2024 was analyzed to assess the characteristics of solar development on agricultural land. An overlay of solar facility footprints with land-cover and agricultural data showed that between 62% and 76% of those facility footprints occurred on agricultural land. A total of 32% of the solar footprints occurred on agricultural land classified as mineral soil groups (MSG) 1–4, which are highly productive soils. Crops grown before solar construction consisted of other hay/nonalfalfa, field corn, alfalfa, soybeans, grassland/pasture, and winter wheat.[1] These crops are also known to support the dairy industry, as noted by members of the RAISE Committee.

The methodology employed to explore potential future solar development is overly conservative, assuming proposed projects in the NYISO and Standardized Interconnection Requirements (SIR) queues will be constructed. Additionally, the methodology does not account for potential agricultural mitigation policies, siting decisions, transmission line and substation capacity constraints, or potential incorporation of agrivoltaics. Recognizing these limitations and acknowledging the significant historical attrition rate in the queue, these analyses nonetheless provide directional insight and relative magnitudes for proposed private-sector solar investments across the State.

WSP identified 25,295 MW of proposed solar capacity in interconnection queues as of April 2024, which, if constructed, could equate to an estimated 126,475 acres of development, assuming 5 acres per megawatt. Applying historical agricultural siting rates, if all proposed solar projects are built without incorporating agrivoltaics, up to 1.5% of total statewide agricultural land could be developed with solar. Over half of the proposed solar capacity is in 12 counties concentrated in the Mohawk Valley, North Country, Finger Lakes, and Western New York, indicating these regions may experience higher rates of agricultural land-use change and/or may benefit from more focused efforts to integrate agrivoltaic activities. About 72% of proposed solar capacity is associated with projects of 10 MW or greater. However, given the historically high degree of project attrition from interconnection queues, it is unlikely that all of these projects will be constructed.

WSP also analyzed the agricultural footprints of land within major electric transmission line corridors. Statewide, over 40% of all agricultural land lies within 3 miles of existing major electric transmission lines. An association exists between counties with the most proposed solar capacity and those with the most agricultural land within transmission line corridors. Much of the State's existing transmission lines are situated in areas with high agricultural productivity; therefore, RAISE Committee members expressed concern that transmission upgrades to those lines would increase pressure for solar development in those areas. Future analyses may consider the role of solar energy on agricultural land and electricity needs to support the expansion of the dairy industry in New York State. Committee members, producers, and agribusiness associations identified the ongoing and planned expansion of dairy processing in New York State as a driver of agricultural growth. Energy reliability and access to three-phase power were identified as key needs to enable dairy producers' modernization and expansion.

Section 3, Impacts and Benefits of Solar Development on the Agricultural Economy, presents information from a literature review and stakeholder interviews to characterize potential economic effects and tradeoffs of solar development on agricultural land. Topics include agricultural land and lease values, potential local and regional economic effects, and considerations for estimating the economic effects from the potential loss of agricultural land. Notably, only 16% of the 30,650 farms in the State reported net gains of $50,000 or more in 2022, while 60% reported net losses, according to the 2022 New York State Census of Agriculture. These figures provide useful context when considering the potential economic tradeoffs.

Information gaps regarding the characteristics of farmer-landowners who lease land for solar development and their associated lease-income spending hinder efforts to quantify the economic effects of solar on agriculture. However, preliminary research indicates that farmer-landowners may use solar lease revenue to supplement farm income and bolster farm operations. Solar lease rates are considerably higher than agricultural lease rates. The high rates may exert upward pressure on agricultural leases and land values and could affect the availability of agricultural land and/or increase the cost of renting or purchasing it. Payment in Lieu of Taxes (PILOT) agreements, host community agreements, and spending associated with the construction and operation of solar projects generate revenue for host municipalities; however, less is known or documented about the potential economic effects of agricultural land loss.

In interviews, representatives of agribusiness trade groups did not describe any current business effects or pressing concerns regarding solar development, though the Northeast Dairy Producers Association reported that competition from solar for land is a concern for some dairy farmers. Prior efforts to identify the "critical mass" of agriculture needed to sustain nearby agricultural support services are documented, as are efforts to model the effects of agricultural land loss from solar projects. Further socioeconomic research to address State-specific information gaps and further evaluation of prior economic modeling efforts on agricultural land loss are warranted to advance this Committee's inquiry into potential regional agronomic effects of solar energy.

Section 4, Preliminary Key Takeaways, summarizes Phase 1 findings described earlier, discusses key information gaps by section, and poses key questions and recommendations for future efforts. The findings in this Phase 1 report provide a preliminary assessment of the potential land use and economic impacts of solar development on New York State's agricultural sector. While the report offers insights into current and projected solar siting trends, associated potential land use changes, and economic implications, it is constrained by data limitations that must be addressed in future phases of exploration.

These limitations include incomplete spatial data for built solar projects and misclassification of land cover in national datasets, which undermine the accuracy of land-use change estimates. Additionally, Phase 1 treats agricultural land affected by existing and proposed solar development as fully removed from production, thereby adopting a more conservative viewpoint to explore potentially impacted acreage. Future analyses should account for existing and potential integration of agrivoltaics.

Additional insights into agricultural trends will benefit future analyses. For example, a better understanding of the acres required under Nutrient Management Plans will provide a more complete picture of the land use needs of New York State's large and growing dairy industry. County-level data may help assess how land use changes affect regional agribusiness across various agricultural commodities.

As work with the RAISE Committee continues, additional efforts to explore the intersection of agriculture and solar energy development in New York State must consider the driving forces of change in both sectors, including technological advances, market forces, and the policy environment that influences each. More work is needed to expand and improve methodologies for analyzing future scenarios across both sectors to develop an informed assessment of the potential opportunities and tradeoffs involved in achieving New York State's renewable energy goals while supporting its agricultural lands, communities, and economy.

1. Introduction

This report aggregates findings from a Phase 1 study on land use associated with solar energy development and its potential implications for New York State's agricultural economy. Section 1 provides an overview of the Regional Agronomic Impact from Solar Energy Specialist Committee (RAISE Committee), the impetus for this study, and the historical context for understanding the State's solar and agricultural landscapes. Section 2 summarizes investigations into agricultural land-use changes resulting from solar and nonsolar uses. Section 3 identifies potential tradeoffs of solar development related to the State's agricultural industry gleaned from literature review, interviews, and RAISE Committee engagements. Section 4 outlines preliminary takeaways, information gaps, and recommendations for further study.

1.1 Regional Agronomic Impact from Solar Energy Specialist Committee Origin and Purpose

Certain stakeholders have expressed concerns about potential conflicts between solar development and agricultural lands and operations. In 2021, the New York State Energy Research and Development Authority (NYSERDA) convened the State Agricultural Technical Working Group (A-TWG) to bring together State agencies; agricultural land and farmer advocates; nongovernmental organizations (NGOs) that focus on clean energy, climate, agriculture, and environmental protection; local government officials; solar developers and operators; and academic experts to steer efforts in advancing renewable (primarily solar) energy development across scales in a responsible way that supports the State's agricultural operations, lands, farmers, and communities. In response to concerns raised by A-TWG members, recommendations developed by the State Farmland Protection Working Group (AGM 2022a), and legislative interest, NYSERDA convened the RAISE Committee under the A-TWG to assist NYSERDA in identifying and characterizing:

1. Drivers of agricultural land conversion
2. Tradeoffs of solar development relative to New York State's agricultural industry
3. Study approaches for assessing solar development impacts on regional agricultural productivity and economies

This study and subsequent analyses will inform policy recommendations on solar siting and related issues to support the overall goal of balancing the State's renewables goals with its agricultural priorities. Committee members include representatives of small- and large-scale dairy producers; field crop growers; fruit and vegetable growers; and those engaged in farmland protection, economic development, or farm viability efforts at county and statewide levels. Appendix A provides additional details on the committee's purpose.

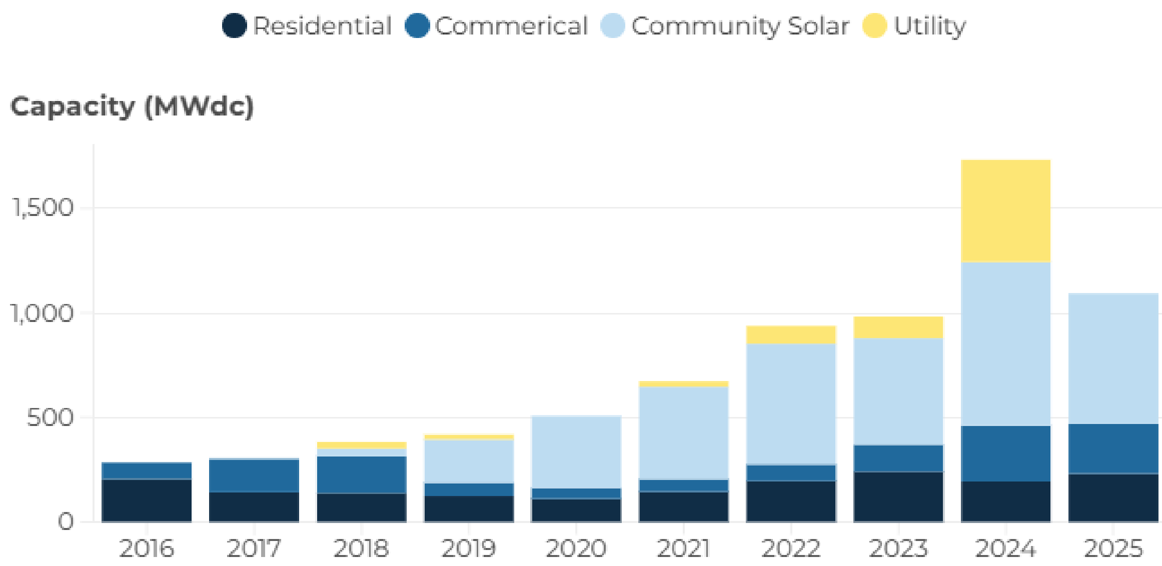
1.2 New York State Solar Energy Context

New York State's solar energy landscape sits at the intersection of clean-energy advancement and farmland preservation. Solar projects in New York State operate within a regulated framework that includes State-level oversight, environmental review, agricultural mitigation standards, and local land-use controls. Through instruments such as the Office of Renewable Energy Siting's permitting process, the Department of Agriculture and Markets' *Guidelines for Solar Energy Project—Construction Mitigation for Agricultural Lands*, and NYSERDA's model solar zoning laws and guidance for solar installations on agricultural lands within its *New York State Solar Guidebook*, the State has built a structured regulatory environment for renewable energy development that incorporates agricultural protection (AGM 2019; NYSERDA 2025d).

New York State's solar energy capacity steadily increased from 2016 to 2024, followed by a decrease in 2025. The historic increase in solar energy capacity has been driven by residential and commercial rooftop installations and, more recently, by the construction of larger, ground-mounted community-scale and utility-scale solar projects. The decline in 2025 installations reflects national trends, driven by trade actions, and overall market and policy uncertainty (SEIA 2026a). In 2025, approximately 7.6% of New York State's electricity was generated from solar (SEIA 2026b). Figure 1 shows the types of solar installations constructed since 2016 (SEIA 2026b).

Figure 1. New York Annual Solar Installations

Source: SEIA (2026b).



Utility-scale projects typically exceed 5 MWac and are built to supply wholesale electricity to the grid. Community-scale projects are typically ≤5 MWac (NYSERDA 2025d); for the purposes of this study, community-scale projects are defined as solar projects with a capacity of 1-5 MWac.

The Renewable Action through Project Interconnection and Deployment (RAPID) Act, enacted in April 2024, aims to streamline permitting for major renewable energy and electric transmission projects and consolidate the environmental review, permitting, and siting of facilities under the New York State Office of Renewable Energy Siting and Electric Transmission (ORES). Revised RAPID Act regulations were released in October 2025 and are expected to be finalized by 2026 (PSC 2025).

Under the RAPID Act, all large-scale renewable energy projects of 25 MW or greater must obtain a permit from ORES for both new construction and expansion. The permit must comply with State regulations to avoid, minimize, and mitigate impacts on resources, including agricultural lands in mineral soil groups (MSG) 1–4. Pathways include limiting the extent to which a project is sited on agricultural land or incorporating agrivoltaic activities.

Projects under 25 MW are typically permitted at the local level through the State Environmental Quality Review Act, which requires an evaluation of potential environmental impacts. Additional federal, discretionary, and/or ministerial permits are usually required for both ground-mounted community- and utility-scale solar projects. Community-scale projects between 1 and 5 MW are almost exclusively permitted by local municipalities.

As a component of the Accelerated Renewable Energy Growth and Community Benefit Act, NYSERDA was directed to establish the Build-Ready Program, which is meant to take previously developed sites—such as landfills, brownfields, and former industrial sites—partway through a development process to make them "build-ready" for renewable energy developers to complete and operate. According to the *Build-Ready Program: Five-Year Review (October 2020–September 2025* (NYSERDA 2025a*)*, Build-Ready has determined that very few sites in New York State both meet the program's numerous requirements (e.g., previously developed site, no agricultural land, no competition with the private sector) and support economically viable large-scale renewable energy projects. In the 5-year review, NYSERDA proposed that the New York State Public Service Commission (PSC) issue an order terminating the program and noted that NYSERDA will continue to explore opportunities to repurpose previously utilized sites through an economic development lens.

New York State's 2025 State Energy Plan, released on December 16, 2025, outlines a 15-year vision to guide the State's energy strategy. In its core planning scenario for meeting energy needs through 2040, the State Energy Plan identified the techno-economic potential for deployment of 24 GW of additional solar capacity by 2040 (New York State Energy Planning Board 2025).

1.3 New York State Agricultural Context

Agriculture is an important part of New York State's economy. In 2022, farming contributed $2.7 billion to the State's gross domestic product (GDP), and in 2019, employment in the agricultural industry represented approximately 2.1% of total State employment (NYS Comptroller 2024, Schmit 2021). The top five agricultural regions of the State by total agricultural sales are the Finger Lakes, North Country, Central New York, Western New York, and Southern Tier (see Table 1). Figure 2 shows the percentage of farmland across the State by county.

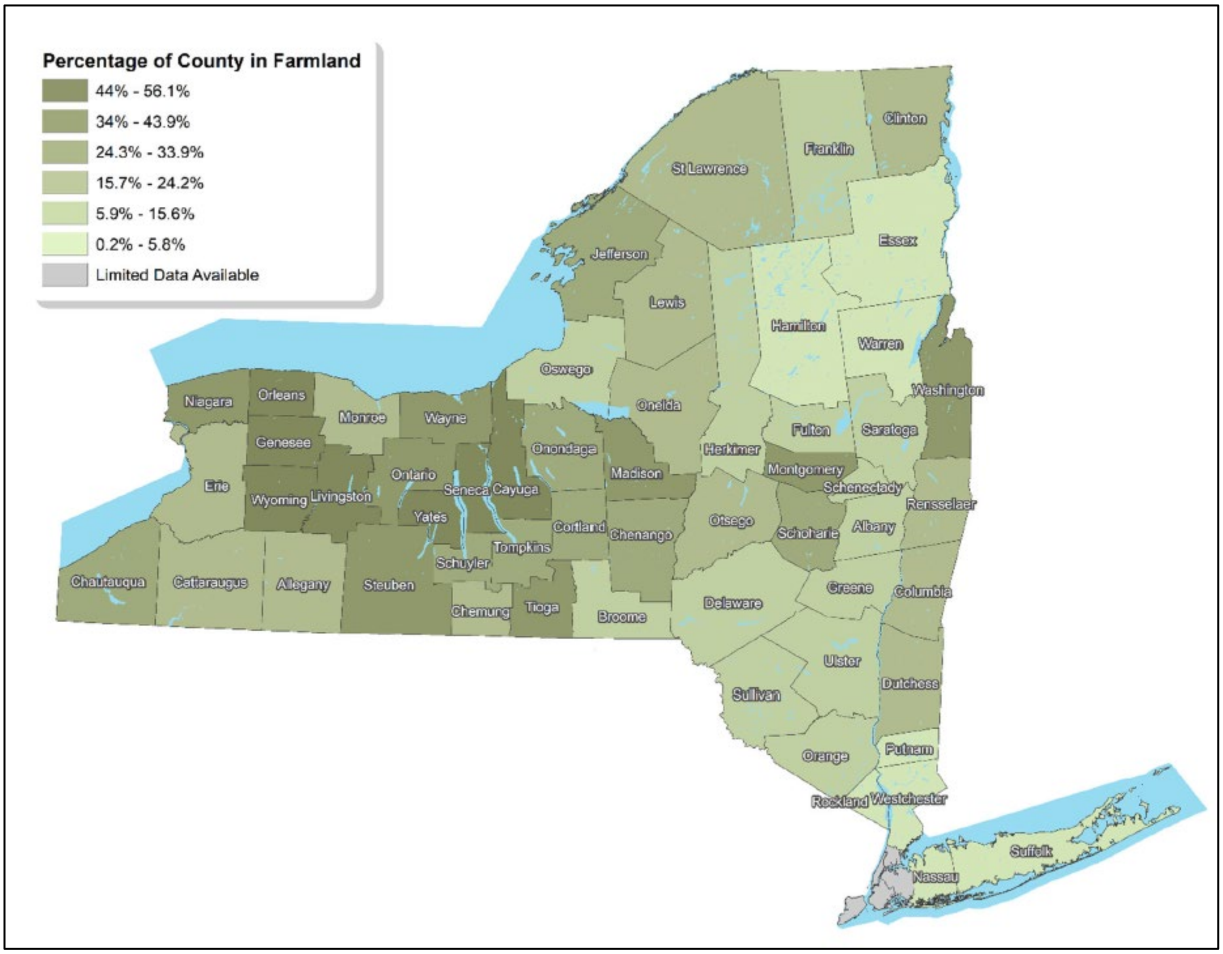
Table 1. Farms, Farmland, and Agricultural Sales by New York Region, 2022

Source: New York State Comptroller (2024).

Region	Farms	Acres of Farmland	Total Agricultural Sales
Capital Region	3,068	522,254	$633,367,000
Central New York	2,965	734,823	$1,101,106,000
Finger Lakes	5,578	1,363,744	$2,341,356,000
Hudson Valley	2,280	307,848	$300,942,000
Long Island	607	34,486	$372,942,000
Mohawk Valley	3,381	679,982	$544,773,000
New York City	52	86	$7,499,000
North Country	3,612	1,031,319	$1,174,569,000
Southern Tier	4,747	1,054,856	$754,996,000
Western New York	4,360	772,863	$805,484,000

Figure 2. Farmland as a Percentage of Total Land Area by County, 2022

Source: New York State Comptroller (2024).



Of New York State's 6.5 million acres of farmland, approximately 3.6 million acres (56%) are used for growing crops, and approximately 2.9 million acres (44%) are used for animal agriculture, including grazing and growing crops for animal feed (USDA NASS 2024a; NYS Comptroller 2024). Approximately 1.8 million acres (28%) are comprised of dairy farms (USDA NASS 2024a). Dairy is the largest sector of New York State's agricultural industry, and the State is the fifth largest producer of milk in the nation (AGM 2022b). New York farms are also top producers of other products, including beets, apples, maple syrup, and head cabbage.

Challenges facing New York farmers include fluctuating commodity prices (e.g., milk), rising labor costs, international conflicts that affect trade, and the impacts of extreme weather events and unpredictable changes in seasonal weather patterns (NYS Comptroller 2024). According to the 2022 New York State Census of Agriculture, the State has seen a decline in farmland over the past decade. In 2012, approximately 7.2 million acres of land were in farms, decreasing to approximately 6.5 million acres in 2022, representing a loss of more than 9% (USDA NASS 2024a). Large-scale solar projects have the potential to stabilize New York State's farming industry by offsetting economic volatility through long-term, fixed-revenue streams.

The State has supported efforts to conserve and advance New York State's active farmland and agricultural industry. Established in 1971, the Agricultural Districts Law was implemented to promote "the development and improvement of [the State's] agricultural lands" and to "preserve critical masses of farmland" (Kehoe n.d., Lapping and Leutwiler 1987). New York State Agriculture and Markets Law Article 25-AA encompasses the creation and review of agricultural districts, agricultural assessments associated with tax exemptions, farmland protection boards, and other agricultural advisory boards (New York State Senate n.d.a.). An "agricultural district" is defined as a geographic area that consists predominantly of viable agricultural land and functions to encourage the continuation of farming by providing protections and benefits to agricultural landowners (AGM n.d.).

The emergence of renewable energy has given rise to additional considerations for agriculture, and the State has steadily adopted procurement and permitting policies intended to avoid and mitigate impacts to agricultural lands. NYSERDA's procurement of renewable generation from utility-scale renewable energy projects ("Tier 1 renewables") requires proposers of solar projects to quantify expected impacts on active agricultural land and mineral soil groups (MSG) 1–4, forested land, and to consider strategies for co-utilization (NYSERDA 2025b). The most recent solicitation guides the development of an Agricultural Co-Utilization Plan (ACUP) that addresses how to incorporate agrivoltaics into project design to support continued agricultural use within the inside-the-fence component of a solar project.

Key milestones related to NYSERDA's solar siting policy as it pertains to agricultural considerations include:

- 2019: New York State Department of Agriculture and Markets (AGM) *Guidelines for Solar Projects—Construction Mitigation for Agricultural Lands* were enhanced and became mandatory for Tier 1 renewables in 2020 (AGM 2019).
- 2020: The Agricultural Mitigation Payment was implemented for solar projects proposed in a certified agricultural district.
- 2021: The Smart Solar Siting Scorecard was established (first as voluntary but since 2022 has become mandatory) and is used to evaluate utility-scale solar project applications for their avoidance and minimization of agricultural and forest land impacts.
- 2022: The Agricultural Mitigation Payment Deferral Option was introduced to encourage agricultural co-utilization of solar projects (NYSERDA 2024b, section 4.3.5).
- 2023: NYSERDA, in collaboration with the A-TWG, commissioned the report "Growing Agrivoltaics in New York State" to identify potential opportunities and constraints associated with increasing uptake of agrivoltaics projects in the State (NYSERDA 2023a).
- 2024: NYSERDA launched a $5 million program to fund demonstration projects that integrate solar with active farming, supporting agrivoltaic innovation and knowledge-sharing across New York State (NYSERDA 2024a).
- 2025: NYSERDA includes "Appendix 6—Guidance for Development of an Agricultural Co-Utilization Plan" within its 2025 Tier 1 solicitation to support planning for integration of agrivoltaic activities within projects as feasible (NYSERDA n.d.).

2. Land-Use Analysis

WSP conducted various land-use analyses to advance understanding of historic and prospective patterns of land-use change at the intersection of agriculture and solar development. Section 2.1 focuses on historical agricultural land-use change resulting from both solar and nonsolar uses. Section 2.2 details the characteristics of constructed solar projects to support understanding of the current state of solar and potential implications for agriculture. Section 2.3 explores a future state that assumes that proposed projects in the New York Independent System Operator (NYISO) and Standardized Interconnection Requirements (SIR) queues will be constructed on agricultural land, to visualize a high development scenario and consider potential implications. Future projections also consider proximity to electric transmission as a likely driver of solar development, provided capacity is available.

Land-use analyses leveraged the following datasets. Appendix F provides a global data table.

Land use:

- National Land Cover Database (NLCD) dataset years 2001, 2016, and 2021 (USGS 2001, 2016, 2021).
- U.S. Department of Agriculture Crop Sequence Boundaries years 2016-2021 (USDA NASS 2016).
- Mineral Soil Groups 1–4 from NYSERDA (NYSERDA 2022, 2024c).
- U.S. Census 2010 and 2020 population data (Esri 2010, 2020).

Transmission:

- Electric Power Transmission Lines, Homeland Infrastructure Foundation Level Database (Geospatial Management Office 2022).

Built and proposed solar projects:

- U.S. Large-Scale Solar Photovoltaic Database (USPVDB) V3.0, April 2025 (Fujita et al. 2023).
- NYS Statewide Distributed Solar Projects (2000–2024) queried for projects 1 MW or greater (NYSERDA 2025c).
- NYISO 2025 NYCA Existing Generating Facilities (PV Unit Types) (NYISO 2025a).
- NYISO queue interconnection requests queried for solar projects (S and CR), 1 MW or greater AC, including projects in service (NYISO 2024).

- SIR Inventory Information queue for interconnection requests of community-scale projects across the six primary utility service territories—National Grid, Consolidated Edison, Inc. (Con Edison), Central Hudson Gas & Electric Corp. (Central Hudson), Orange and Rockland Utilities, Inc. (O&R), New York State Gas & Electric (NYSEG), Rochester Gas & Electric (RG&E), and Public Service Enterprise Group (PSEG)—filtered to show projects greater than or equal to 1 MWac, and projects that are not completed (DPS n.d.).

2.1 Historical Agricultural and Solar Land Use Drivers and Patterns

WSP conducted a land change analysis to determine historical agricultural land conversion rates, providing context for understanding the historical role of solar development in such conversions.

1985 NLCD data—the earliest available dataset—identified 7,124,485 acres of total agricultural land (hay/pasture and cultivated crops). By 2021, that figure had declined to 6,426,853 acres. Between 2001 and 2021, the NLCD analysis determined a loss of 165,969 acres of total agricultural land, of which about 90,000 acres were converted (or reverted) to nondeveloped land uses, such as shrub/scrub or forest lands. For example, approximately 75,000 acres of hay/pasture lands were returned to deciduous, evergreen, or mixed forests during the time.

The NLCD analysis also found that between 2001 and 2021, approximately 76,000 acres of agricultural land, or an average of 3,600 acres per year, were converted to development (largely exclusive of solar),[2] defined as all types of NLCD "Developed" categories, including Open Space and Low, Medium, and High Intensity (see Figure 3 and Table 2). Nearly half of the acres converted to development (approximately 36,000) were highly productive agricultural soils in MSG 1–4.[3] Agricultural land conversion has typically followed predictable patterns around urban areas across the State, with more diffuse agricultural conversion in more rural areas, as shown in Figure 3.

Figure 3. Mineral Soil Groups and Agricultural Land Conversion from Development, 2001–2021

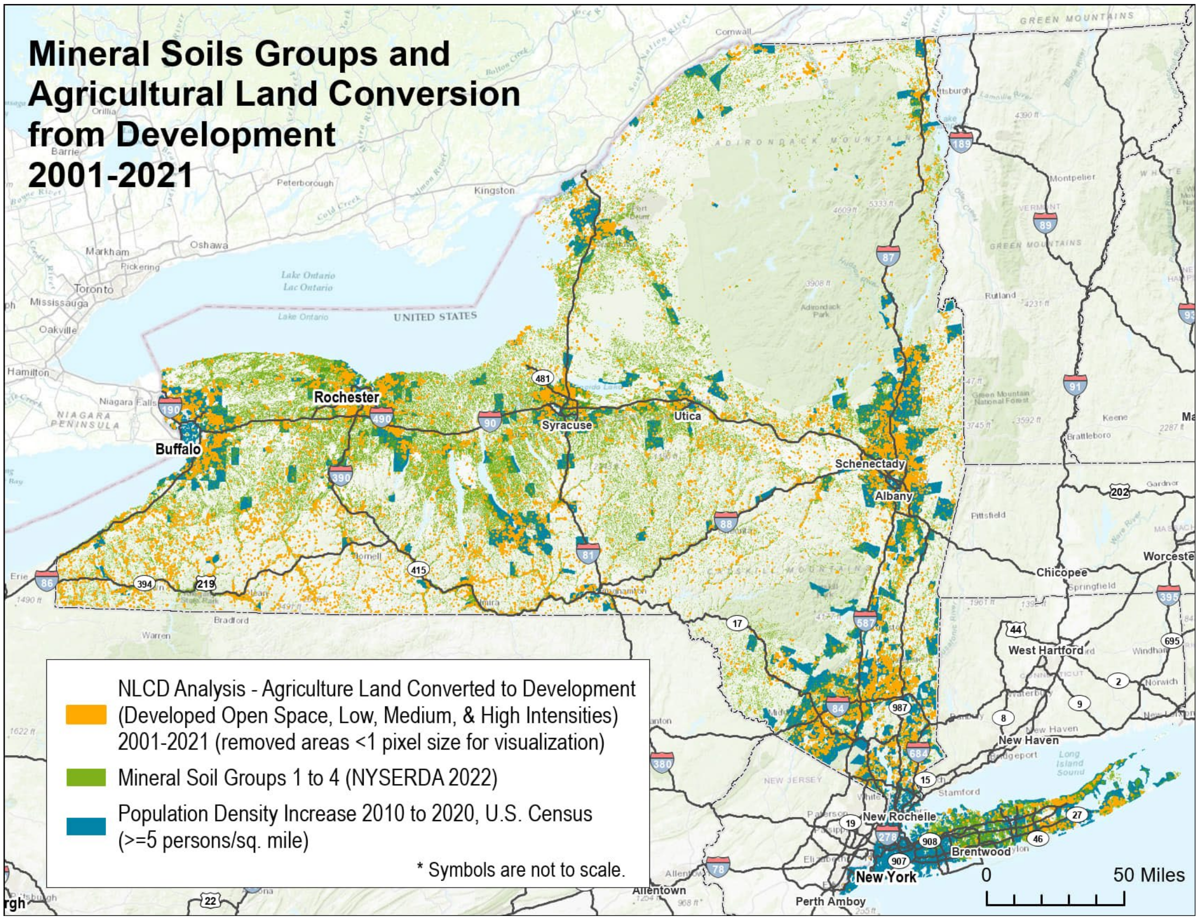


Table 2. National Land Cover Database Development Category Definitions

Source: MRLC (n.d.).

NLCD Development Category	Definition
Developed, Open Space	Areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20% of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes.
Developed, Low Intensity	Areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20% to 49% of total cover. These areas most commonly include single-family housing units.
Developed, Medium Intensity	Areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50% to 79% of total cover. These areas most commonly include single-family housing units.
Developed, High Intensity	Highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses, and commercial/industrial. Impervious surfaces account for 80% to 100% of the total cover.

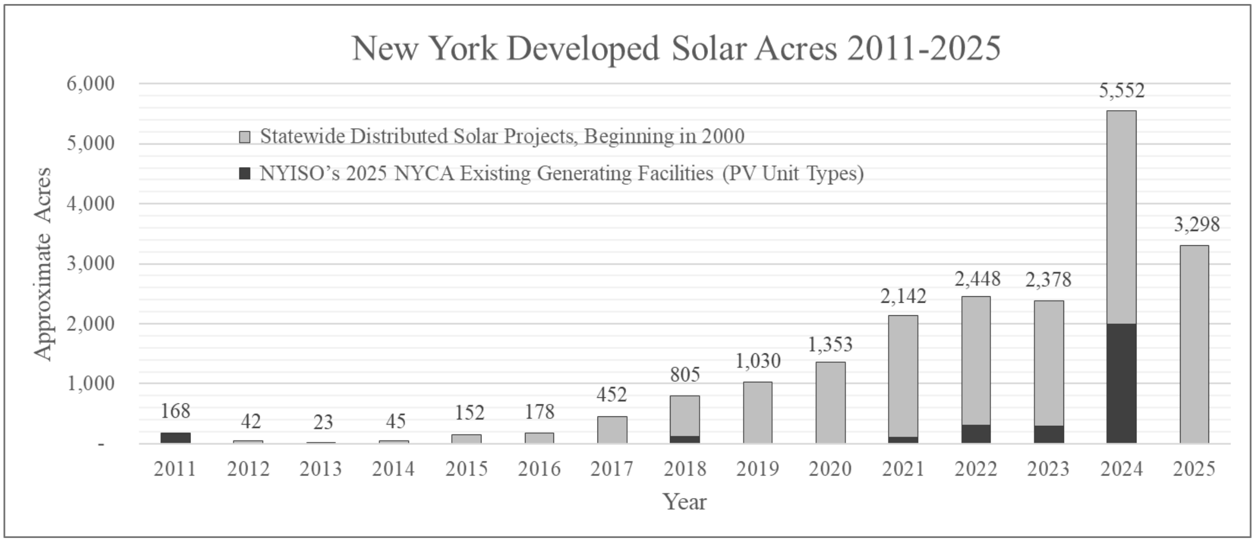
We also reviewed the literature to identify additional land use change studies for comparison. In one separate study, American Farmland Trust (AFT) found that between 2001 and 2016, approximately 56,300 acres of agricultural land were converted to urban and highly developed uses. An additional 197,200 acres of agricultural land were converted to low-density residential, a category characterized by "scattered large lot development," which may retain limited agricultural activity but is at high risk for full conversion to urban and highly developed land (AFT 2020). Cumulatively, these categories amount to an estimated 16,900 acres per year. AFT's average of 16,900 acres per year differs from WSP's average of 3,600 acres per year because AFT includes the "low-density residential" land use category. WSP's analysis was derived from NLCD data and did not use the low-density residential layer, which is not an NLCD category and is proprietary to AFT.

Data from the 2022 New York State Census of Agriculture were also reviewed, revealing a significantly higher total loss of land in farms. Between 2002 and 2022, land in farms declined by 1,158,683 acres, or approximately 58,000 acres per year (USDA NASS 2024a). The loss captured by the Census of Agriculture data reflects economic pressures on farmers and farm consolidation in addition to farmland conversion (New York Farm Bureau n.d.; NYS Comptroller 2024).

The number of acres for annual solar energy development is increasing. WSP conducted an analysis focused on solar development and land use change. Of note, changing primary land use to solar does not preclude potential for agricultural activities through agrivoltaics or protection of topsoil, for example, by mechanisms outlined in the 2019 AGM's "Guidelines for Solar Projects—Construction Mitigation for Agricultural Lands" or integration of pollinator habitat, for example. An estimated 20,066[4] new acres of solar development of 1 MWac or greater have been constructed from 2011 through 2025 (detailed methodology in Appendix B).[5] This total was derived from the nonspatial datasets of New York Statewide Distributed Solar Projects (beginning in 2000)[6] and NYISO's 2025 New York Control Area (NYCA) Existing Generating Facilities, specifically photovoltaic (PV) unit types.[7] To estimate acreage, we used an estimated 5 acres of land per MW of solar capacity.[8] Note, this analysis was unable to exclude large (>1 MW) commercial solar rooftop and parking canopy installations, which represent approximately 3% of the installed capacity, adding some additional uncertainty to the acreages expressed in Figure 4.

Figure 4. New York State Developed Solar Acres, 2011–2025

The developed solar acres were calculated from NYISO's 2025 NYCA Existing Generating Facilities, combined with the New York Distributed Solar projects list, which was queried for projects ≥1 MWac. Acreages were derived by estimating 5 acres/MWac. The acreages in the figure below include all lands, not just agricultural lands (total acres labeled above each bar).



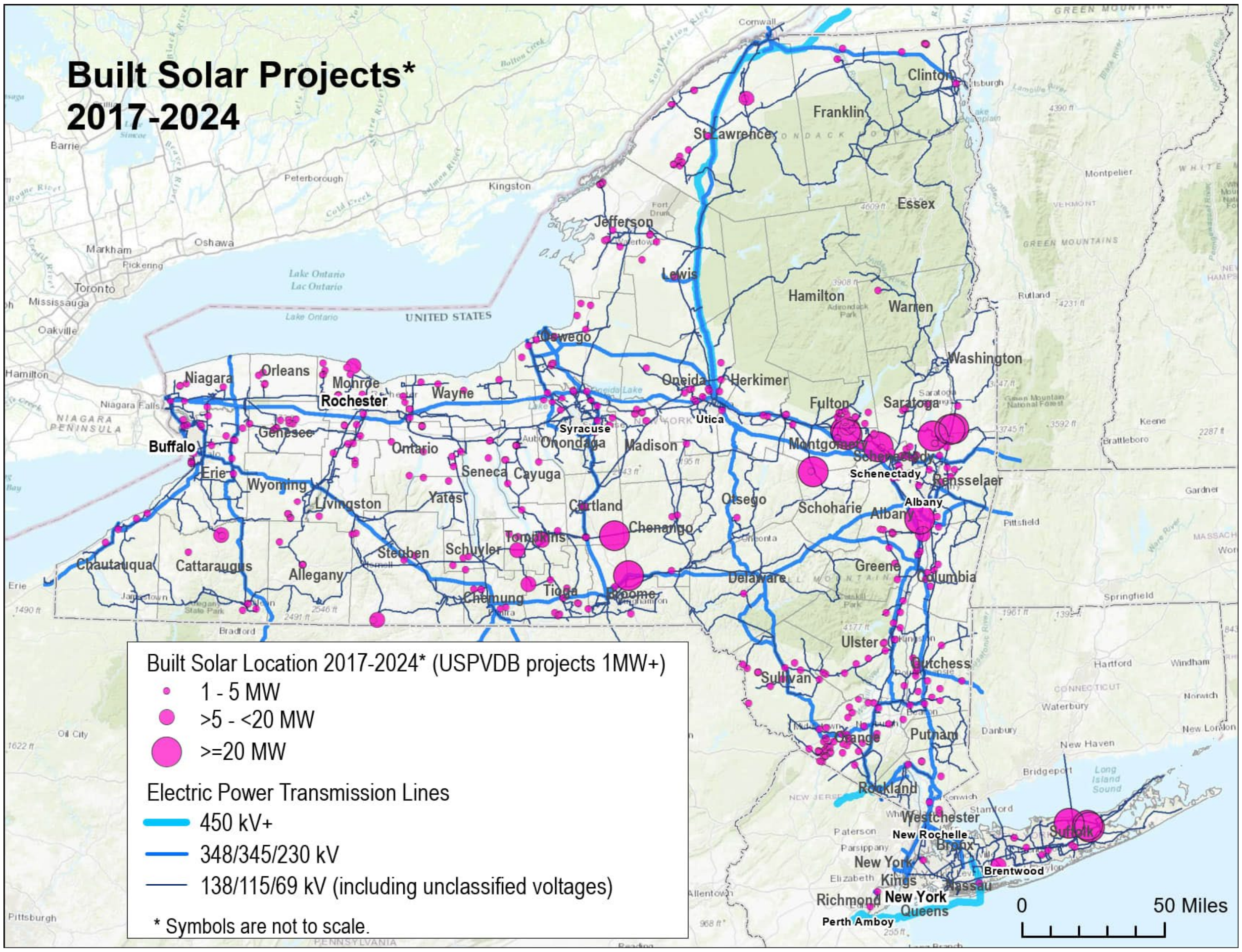
Although the acreages expressed in Figure 4 are approximations, solar development has increased—as anticipated based on the State's clean energy goals—and solar acreage between 2021 and 2025 averaged over 3,160 acres per year across all lands, including nonagricultural areas.

The analyses of built solar projects throughout this section are isolated to 7,812 acres of projects constructed between 2017 and 2024 for which geospatial information is available in the USPVDB;[9] this time period was selected to compare spatial data for built solar projects with land change datasets. The 7,812 acres of mapped, built solar projects represent 39% of the estimated 20,066 total acres of constructed projects, and comprise 6,228 acres (80%) of 1 to 5 MW projects, 363 acres (5%) of >5 to <20 MW projects, and 1,221 acres (16%) of ≥20 MW projects.

Recent patterns in solar development indicate that larger utility-scale projects tend to be sited in more rural areas due to the space required for large-scale energy generation. Figure 5 shows that, between 2017 and 2024, solar projects 1 MW up to 20 MW have concentrations outside of major population centers in the Hudson Valley, Capital District, and Finger Lakes regions. Utility-scale solar projects larger than 20 MW have been predominantly built in more rural areas of the Capital Region, Mohawk Valley, and Southern Tier regions.

Figure 5. Built Solar Projects, 2017–2024

Shown are 405 projects that range from 1 to 5 MW, 12 projects that range from >5 to <20 MW, and 14 projects that are ≥20 MW.



Solar projects, especially larger projects, are built near transmission lines. Of the 15 larger utility-scale solar projects (≥20 MW) in the State that are mapped in the USPVDB v3.0, 11 connect to transmission lines between 69 kV and 115 kV, two connect to 34.5 kV lines, and two connect to 138 kV lines. WSP measured the distance from the point of interconnection (POI) to the farthest solar panel across 15 utility project footprints and found distances ranged from 0.63 miles to 1.73 miles. This illustrates that utility-scale solar projects typically develop within approximately 1 mile of a transmission line or substation, and potentially as far away as 2 miles based on this limited sample size and the respective transmission line voltage levels (see Table 3).

Table 3. Proximity of Utility-Scale Projects to Transmission Lines

Source: USPVDB v3.0 to identify location and extents of utility-scale projects, modified in consultation with NYSERDA to add one missing site, "Hecate Energy Albany 1 LLC"; POI data from NYSERDA.

Transmission Line Interconnection kV	Number of Utility-Scale Projects	Average Miles to POI	Max Miles to POI	Min Miles to POI
34.5	2	1.05	1.27	0.82
69	5	0.92	1.38	0.63
115	6	0.89	1.26	0.71
138	2	1.29	1.73	0.84
Total	**15**	**0.97**	**1.73**	**0.63**

Takeaways: Between 2001 and 2021, loss of agricultural land has been primarily attributed to land transitioning to shrubland, forest, and other nondeveloped land uses, as well as development (largely excluding solar) that primarily extends from existing urban and suburban centers. In recent years, solar construction has contributed to changes in agricultural land use. Solar is introducing new development patterns in rural areas that largely follow proximity to transmission lines, particularly for larger solar projects. Land use changes associated with solar development may be compatible with concurrent agricultural use or integration of pollinator habitat, whereas agricultural land converted to urban and residential use more clearly results in the loss of agricultural capacity.

Limitations: Spatial data were available for only about 39% of constructed solar sites. The NLCD data on agricultural land is based on the interpretation of aerial surveys and, while improving over time, may misinterpret or misclassify vacant or emergent shrub land and agricultural and pasture lands. An analysis of the characteristics of converted agricultural land was not performed, and so it does not account for, for example, productivity factors of converted land. Estimated solar acreage data is a broad approximation that also includes large rooftop installations, likely leading to an overestimation of solar acreage. Transmission line proximity analysis was performed only for 15 constructed utility-scale projects; a similar analysis for community-scale projects was not performed.

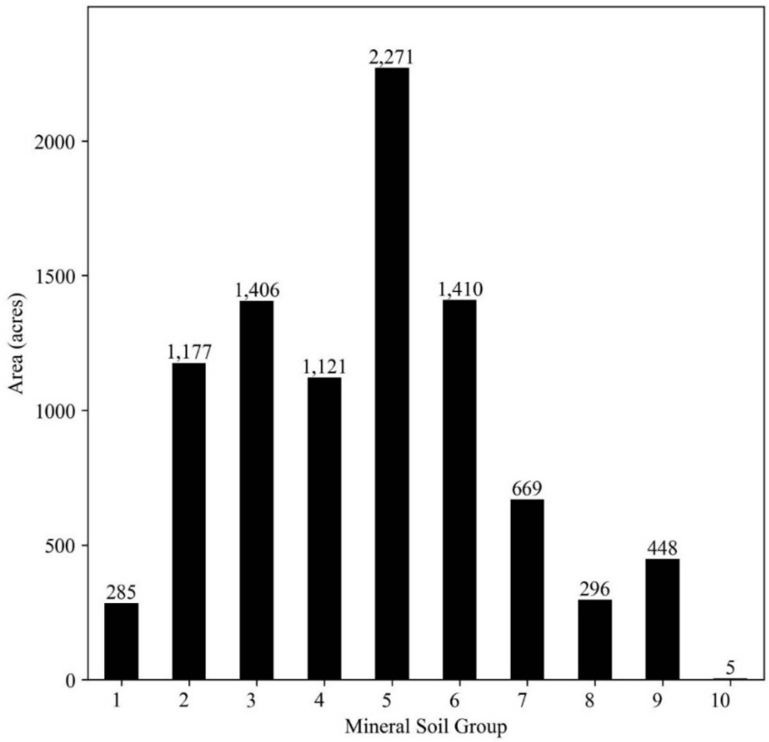
2.2 Characteristics of Solar Projects Constructed on Agricultural Lands

WSP also analyzed data to understand the spatial and agricultural characteristics of built solar projects for which geographic information is available. This section provides information on the percentage of solar projects constructed on agricultural land, as well as information about soil characteristics and prior crops grown. In this analysis, WSP did not tabulate how many of these acres may still be in agricultural use, including agrivoltaic activities, such as sheep grazing.

Between 62% and 76% of solar development in the USPVDB occurred on agricultural land, based on the USDA Crop Sequence Boundaries and NLCD databases, respectively.[10] WSP reviewed 7,812 acres of built solar projects mapped in the USPVDB between 2017 and 2024 against identified agricultural land data by the U.S. Department of Agriculture's (USDA) Crop Sequence Boundaries (CSBs) (USDA NASS 2016) and NLCD (USGS 2016) databases (see Appendix C, Map 2). This estimate is consistent with research conducted by Koch and Woodbury (2024), which found that over 50% of solar project acres were constructed on previously cultivated agricultural land.

Soil characteristics of built solar projects in the USPVDB. WSP overlaid the mapped built solar projects with the State MSG 1−4 data and found that 41% of the total acreage of built solar projects occurred on land classified as MSGs 1−4 (otherwise referred to as "highly productive soils"), while 32% occurred on land categorized as both agricultural and highly productive. These overlay rates are consistent with a more granular analysis by Koch and Woodbury (2024), shown on Figure 6, which found that 44% of solar was built on MSGs 1–4, with MSG 5 as the most common type, followed by MSG 6 and MSG 3.

Figure 6. Built Solar Projects (Acres) on MSG 1–4 Soils



Agricultural crops prior to solar development. Using the USDA's CSB 2016 data, WSP calculated that greater than 90% of agricultural land now used for solar energy was previously used to grow other hay/nonalfalfa (38.9%), field corn (27.6%), alfalfa (10.7%), soybeans (7.5%), grassland/pasture (5.2%), and winter wheat (3.0%) (see Appendix C, Map 2), all of which—although not exclusively—are known to support the dairy industry. Koch and Woodbury's 2024 analysis, based on the intersection of detected solar sites and the 2008 land cover layer from the National Agricultural Statistics Service (NASS) Crop Data Layer, found that annual row crops were the most common land cover prior to solar, followed by hay and pastureland, but estimated that up to 30% of solar project acreage may have occurred on misclassified agricultural land that was no longer in production.

Takeaways: Available data indicate that between 62% and 76% of solar project acreage constructed through 2024 occurred on agricultural land. Additionally, 32% of solar project acreage occurred on agricultural land classified as MSG 1–4 highly productive soils. Other hay/nonalfalfa, field corn, alfalfa, soybeans, grassland/pasture, and winter wheat were the predominant agricultural land prior to solar.

Limitations: Spatial data was available for only 39% of built solar projects, and those built solar projects analyzed were largely procured and permitted before the implementation of agricultural mitigation measures detailed in Section 1.3. The NLCD database lacks the granularity to distinguish among vacant, fallow, former, and active agricultural land, which likely results in an overestimate of agricultural land conversion. Additionally, the solar project acreage used in the analysis only captures footprints within the fence line and may not capture active agricultural lands impacted by electric collection lines, access roads outside the solar array area, setback and screening measures, or environmental conservation measures. An analysis of solar project construction overlayed with land in agricultural districts was not performed. The degree to which identified acres for other hay/nonalfalfa, field corn, alfalfa, soybeans, grassland/pasture, and winter wheat support the dairy industry as opposed to another agricultural use is unknown.

2.3 Spatial Characteristics of Proposed Solar Projects

One method to assess the potential implications of future solar development is to use data from interconnection queues to visualize what future development scenarios could look like using those projects that have formally applied for interconnection. This is an extremely conservative approach given the historically high rate of project attrition in interconnection queues. For instance, the historical completion rate of all types of energy projects (not exclusively solar) in the NYISO queue between 2000 and 2019 is 8% by capacity, or 13% by number of requests (Rand et al. 2025). The proposed solar capacity in the interconnection queues is dynamic over time as projects advance or withdraw from the queues in response to market and other conditions. Additionally, exploration of proposed solar project acreage does not account for the possibility that these projects incorporate agrivoltaics.

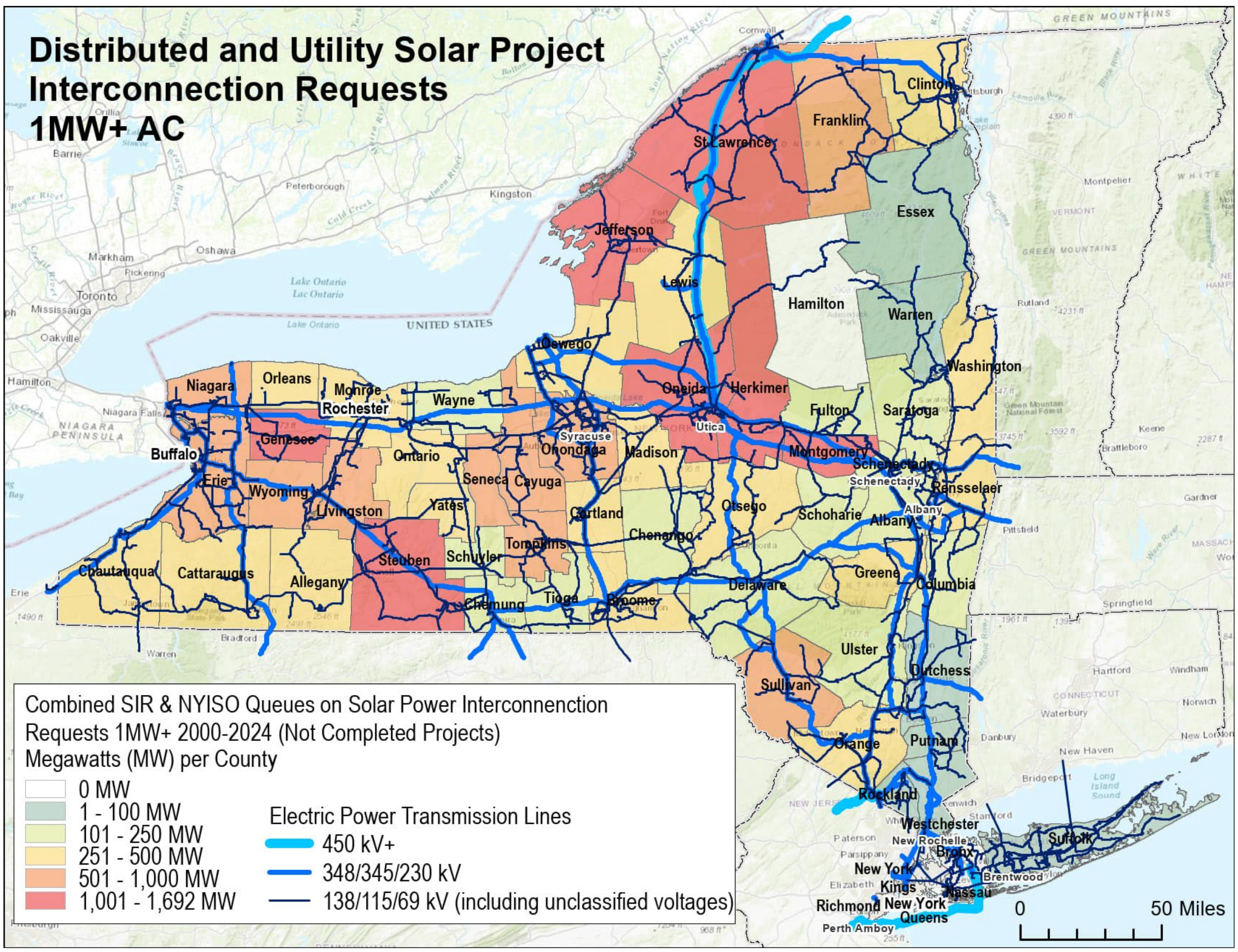
However, our Phase 1 approach is deliberately conservative, aiming to capture and assess the potential for future construction and considerations for where that may be located. This is particularly important because although attrition has historically been high, significant solar development advancement may continue in the coming decade. Future analyses may explore different methodologies for characterizing potential future solar development.

To characterize the potential attributes of future solar development, WSP aggregated proposed utility and community solar projects greater than 1 MW in the NYISO and SIR queues, hereafter referenced as Proposed Projects. While geospatial information is not available for these Solar Power Interconnection Requests, county-level information is provided, which enables comparative analyses with other county attributes.

We base the land use analyses of potential future solar projects on proposed ground-mounted solar projects >1 MWac that had submitted interconnection applications as of April 2024, totaling 25,295 MW of Proposed Projects in the NYISO and SIR queues. Proposed solar development is uneven throughout the State. Approximately 54% of total statewide solar capacity is proposed in 12 counties. Figure 7 shows that counties with the most proposed solar capacity are concentrated in the Mohawk Valley, North Country, Finger Lakes, and Western New York.

Figure 7. Combined NYISO and Standardized Interconnection Requirements Queues on Solar Power Interconnection Requests ≥1 MWac 2000–2024

Does not include completed projects.



Proposed Community-Scale Interconnection Requests

Of the 25,295 MW of Proposed Projects, 7,111 MW are community-scale requests, generally between 1 and 5 MW (approximately 28% of the capacity of Proposed Projects). Table 4 shows the 10 counties throughout the State with the greatest number of community-scale interconnection requests; at least 50 individual community-scale projects are proposed in each of the top 10 counties, which may result in a more dispersed land conversion effect within those counties. However, RAISE Committee members have reported that community projects are sometimes clustered, making the total combined sites appear more like a large utility-scale project.

Table 4. Top 10 Counties for Community-Scale Energy Generation >1 MWac Interconnection Requests of Proposed Projects

Source: DPS (n.d.).

County	REDC Region	MW	Community-Scale Project Count
St. Lawrence	North Country	328.4	73
Chautauqua	Western New York	305.2	72
Erie	Western New York	299.3	71
Orange	Mid-Hudson	266.5	66
Onondaga	Central New York	263.5	61
Broome	Southern Tier	262.4	60
Oneida	Mohawk Valley	254.8	57
Rensselaer	Capital Region	252.4	55
Cattaraugus	Western New York	234.9	53
Steuben	Southern Tier	225.2	50

Proposed Utility-Scale Solar Interconnection Requests

Utility-scale interconnection requests represent approximately 72% (18,185 MW) of the Proposed Projects' capacity (see Table 5). A closer look at utility-scale interconnection requests shows that, while the total proposed solar capacity is much larger than for community-scale projects, they are concentrated among a smaller number of very large projects and are more often proposed in rural counties that may lack a large urban core and associated sprawl.

Table 5. Top 10 Counties for Utility-Scale Interconnection Requests of Proposed Projects

Source: NYISO Queue Solar Interconnect Requests.

County	REDC Region	MW	Solar Project Count
Herkimer	Mohawk Valley	1,599.9	11
Montgomery	Mohawk Valley	1,465.5	13
Jefferson	North Country	1,444.0	11
Genesee	Finger Lakes	1,130.0	5
St. Lawrence	North Country	1,076.8	12
Oneida	Mohawk Valley	895.0	9
Steuben	Southern Tier	857.0	7
Niagara	Western NY	755.0	4
Cayuga	Central NY	688.0	7
Seneca	Finger Lakes	662.8	5

Takeaways: Total proposed solar capacity is unevenly distributed across the State and largely reflects the proposed locations of large utility-scale projects. Approximately 72% of the proposed solar capacity is associated with large utility-scale projects. Counties with the greatest number of proposed community-scale projects are located in all parts of the State, vary in characteristics, and may experience different development patterns depending on how dispersed or concentrated those projects are sited.

Limitations: The interconnection data analyzed for this report only provided county-level granularity. Interconnection queues ordinarily have a degree of attrition and do not reflect the likelihood of actual construction, but provide a market-based indicator of potential future areas of solar development. The analyses in this section did not account for grid capacity.

2.3.1 Potential Agricultural Land Use Change from Proposed Solar Projects

This section presents estimates of future land requirements that might be associated with solar projects proposed in the NYISO and SIR queues and provides context as to solar land requirements related to agricultural land. For this analysis, WSP assumed that 5 acres of land are required per megawatt of solar capacity.[11] While integrating agrivoltaics into proposed and future projects can create overlapping land use that enables continued or new agricultural activity alongside solar infrastructure, this Phase 1 analysis does not account for agrivoltaics. Rather, it presents a more conservative viewpoint for exploring potentially impacted acreage; future analyses may consider offset of potential impacts through agrivoltaic activities.

Statewide Agricultural Land Use Change Potential

Using 5 acres per megawatt, WSP estimated that the 25,295 MW[12] of combined community-scale, or "distributed solar," and utility-scale proposals in the NYISO and SIR interconnection queues (Proposed Projects) would require approximately 126,475 acres of land. Geographic shapefiles for Proposed Projects are not publicly available; to estimate the impact on agricultural lands, WSP applied the historical siting rate of solar projects on agricultural land (62% to 76%, as described in Section 2.2) to estimate the potential acreage of Proposed Projects that might fall on agricultural land.[13] If all of the Proposed Projects in the NYISO and SIR queues are constructed (see Figure 8), an estimated 78,415 to 96,121 acres of solar would occur on agricultural land using those historical siting rates. This equates to 1.2% to 1.5% of the total estimated 6.5 million acres of statewide farmland,[14] assuming static agricultural acreages. If the entire solar queue is sited on agricultural land—an unrealistic and overly conservative viewpoint for illustrative purposes—1.9% of total statewide farmland would be impacted.

RAISE Committee members inquired about the potential land use implications associated with solar capacity that might be needed to meet the State's climate goals. Because the Climate Leadership and Community Protection Act (Climate Act) and subsequent administrative proceedings do not identify the specific mix of zero-emission energy generation resources to meet the State's goals, conducting such an analysis would be speculative. As noted earlier, the 2025 State Energy Plan identifies a techno-economic potential of 24 GW of new solar (including residential and commercial rooftop installations) by 2040.

Takeaways: Statewide, proposed solar in the interconnection queues may displace up to 1.5% of total agricultural land, assuming historical agricultural siting rates. Certain counties with more proposed solar projects could experience higher percentages of agricultural land conversion depending on siting practices.

Limitations: Historical solar siting patterns may not reflect recent changes in statewide solar siting policy, which seeks to steer development away from prime farmland and encourage co-utilization with agriculture. Additionally, the land use efficiency of solar energy production may improve as technology advances, resulting in less than 5 MW per acre, as stated in this analysis. Thus, the results presented in this section likely overestimate potential agricultural land use change. While county-level potential solar capacity is identified in this analysis, additional information on grid capacity and related factors would be needed to estimate county-level land use change with any precision.

2.3.2 Agricultural Characteristics of Land in Proximity to Electric Transmission Lines

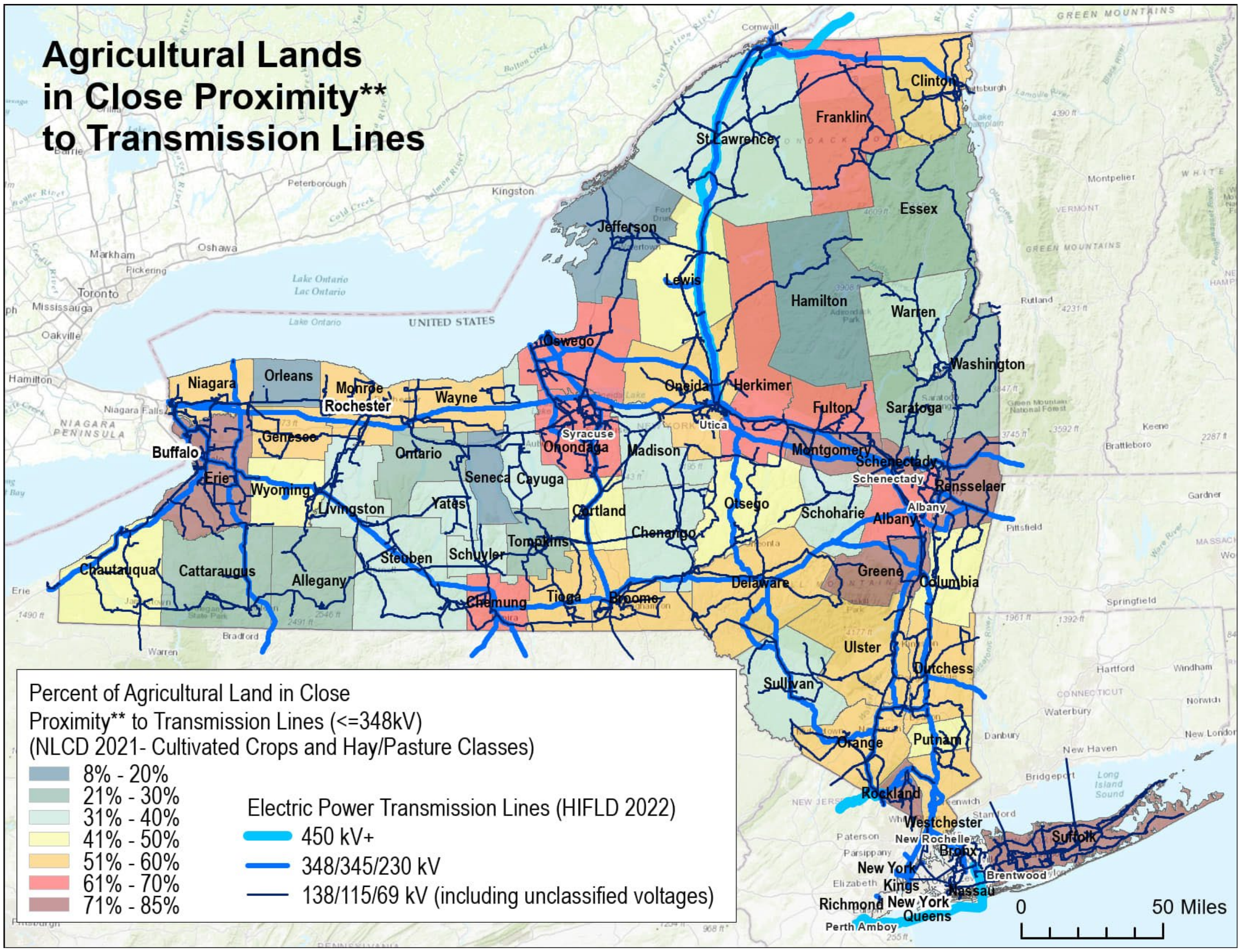
Given the importance of transmission line proximity to solar project siting, especially for utility-scale solar projects, WSP analyzed the agricultural footprints of land within major electric transmission line corridors. "Transmission line corridors" were defined as lands within 1 mile of 69- to 138-kV transmission lines (including unclassified voltages), or within 3 miles of 230- to 348-kV transmission lines, assuming that larger transmission lines allow for interconnections at greater distances.

Based on an overlay of those transmission line corridors with agricultural datasets, a significant percentage of statewide agricultural land, highly productive soils, and field crops known to support the dairy industry were determined to be within those transmission line corridors as follows:

- 44% of Statewide agricultural land is within transmission line corridors (see Figure 8 and Appendix C, Map 4).[15]
- 45% of Statewide MSG 1-4 agricultural land is within transmission line corridors (see Appendix C, Map 5).
- 43% of Statewide field crops characterized as field corn (43%), other hay/non-alfalfa (42%), grassland/pasture (43%), alfalfa (43%), soybeans (44%), and winter wheat (40%) statewide are within transmission line corridors (see Appendix C, Map 6).

As shown in Figure 8, several counties have significantly higher percentages of agricultural land within transmission line corridors. Montgomery County (83%) and Greene County (77%) have the highest percentages of agricultural land within a transmission line corridor, followed by Suffolk County (76%), Rensselaer County (75%), Erie County (74%), and Schenectady County (71%).[16] These counties also have relatively high percentages of their MSG 1–4 agricultural land within transmission line corridors.

Figure 8. Agricultural Lands in Proximity to Transmission Lines



An association exists between counties with the most proposed solar capacity and those with the most agricultural land within transmission line corridors. As shown in Appendix D, 8 of the top 12 counties for proposed solar interconnections also have the highest acreages of agricultural land within transmission line corridors.

The six most abundant crop types within transmission line corridors are corn, other hay/nonalfalfa, grassland pasture, alfalfa, soybeans, and winter wheat (see Appendix C, Map 6). These crops are known to support the dairy industry, as noted by members of the RAISE Committee; however, no specific analysis was conducted to confirm their direct or indirect use for dairy production in these areas. WSP performed an analysis of counties throughout the State with high percentages of these crops planted within transmission line corridors (see Appendix C, Map 6).

Takeaways: We observe an association between counties with the most proposed solar capacity and those with high percentages of overlapping transmission lines on agricultural lands**.** This is also supported by historical siting patterns. Some counties have significant agricultural footprints within transmission line corridors, including significant percentages of crops known to support the dairy industry.

Limitations: The interconnection transmission line or substation capacity attributes that might further refine this analysis were not explored. The transmission line corridor analysis excluded local transmission and distribution lines, where smaller community-scale projects are often sited. Additionally, proximity to transmission lines may increase overall development pressure on identified agricultural land, such as residential; however, additional pressures have not been explored. The analyses in this section do not account for the potential for agrivoltaics.

3. Intersections of State Land Use Policies

Committee members, advisors, and outside speaker guests brought forth additional State policy and market development considerations that may affect solar and agriculture. For example, certain areas of the State may experience an intersection of land use pressures associated with electric demand growth and associated transmission upgrades; dairy industry expansion; agricultural protection efforts; wetlands protection; and initiatives to meet State conservation, reforestation, and carbon sequestration goals, all while farming communities face existing economic pressures related to rising expenses.

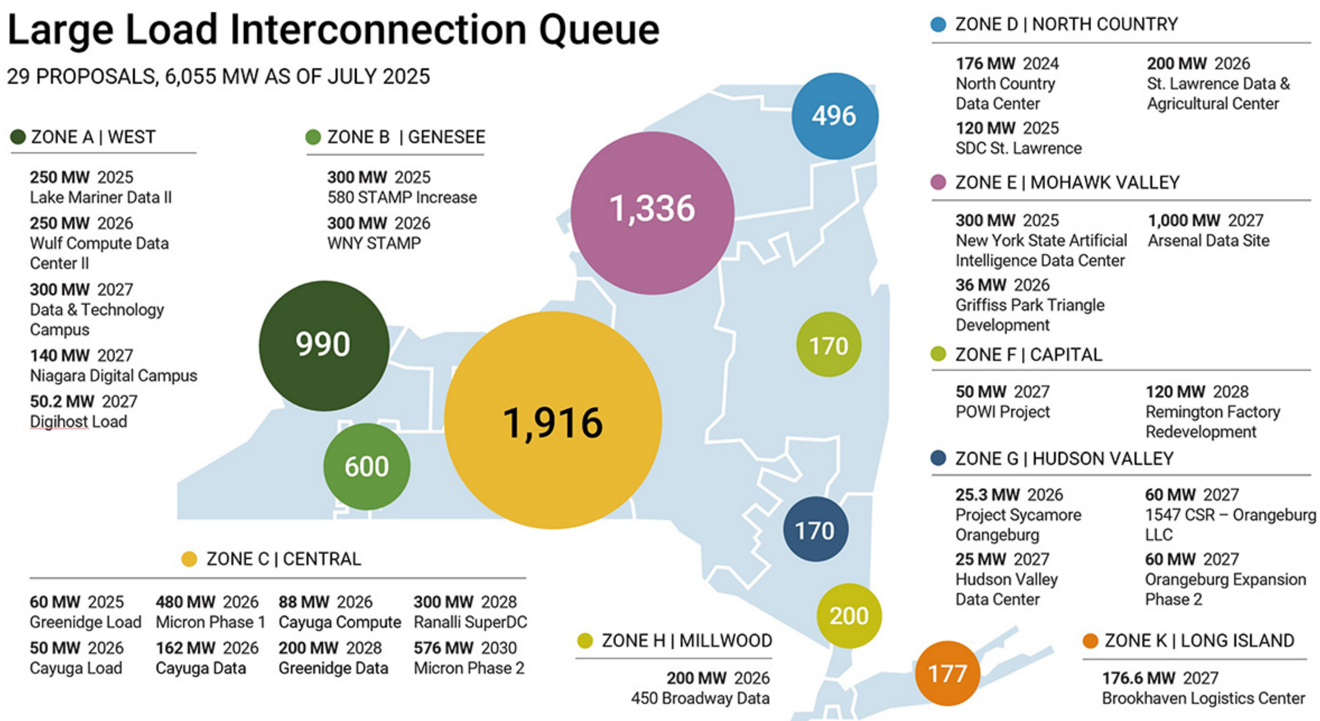
Electric Demand Growth and Transmission Line Development

NYISO recently estimated that electricity consumption within the State is projected to increase between 50% to 90% over the next 20 years in response to economic development and State decarbonization energy policies. This increase is expected to require three times the current electric generating capacity and transmission system upgrades (see Figure 9) (NYISO 2024). NYISO acknowledges potential opportunities and challenges in balancing transmission development with renewable energy development, as the significant land required for renewable energy projects introduces siting and permitting uncertainty, which in turn introduces risks to efficient expansion of transmission and distribution systems.

The NYISO reported that historic levels of investment in the transmission system are underway and that a significant portion of those upgrades occur along existing transmission line corridors. The State Coordinated Grid Planning Process (CGPP) was initiated in 2020 by the PSC to develop a coordinated statewide transmission planning process to identify bulk, local transmission, and distribution system upgrades needed to meet Climate Act targets. The CGPP modeling efforts to identify transmission options favor upgrades to existing lines, emphasizing the quickest, least-cost means of reaching State energy goals while ensuring grid reliability. Because many of the State's existing transmission lines are situated in areas of high agricultural productivity and highly productive soils of the Great Lakes Plains and major river valleys (St. Lawrence, Black, Hudson), RAISE Committee members expressed concern that transmission upgrades on existing lines likely will propel further solar development pressure in areas that may already experience disproportionate pressure.

Figure 9. Potential New Energy Demand Loads from NYISO

Source: NYISO (2025b).



Protection of Agricultural Land

The State has invested hundreds of millions of dollars toward protecting agricultural land since the inception of the State Farmland Protection Program in 1992. This program funds county and local governments to develop protection plans identifying high-quality, productive farmland that may face development pressure. Implementation grants are awarded to land trusts, counties, and municipalities to preserve farmland through agricultural conservation easements, which typically restrict certain types of development while maintaining agricultural use. As outlined in Section 1.3, the State has steadily advanced solar siting policies that consider agricultural protections. Local farmland protection boards are also considering how to protect farmland from pressure from solar development or integrate solar development into farmland protection efforts. WSP reviewed 24 recent (2016–2024) county Agricultural Protection Plans to understand how farmland protection boards consider new solar development. Of the reviewed plans, three included analyses or recommended actions intended to steer solar development away from important farmlands. Wayne County and Lewis County plans include analyses of farmland parcels suitable for solar development, based on land characteristics such as slope, orientation, and proximity to transmission infrastructure (Wayne County Agricultural Development Board 2023, Lewis County Agriculture and Farmland Enhancement Plan

Steering Committee 2021). The counties' plans document the extent of high-quality farmland that may be under pressure from solar development and seek to steer solar development away from high-priority farmlands. Wayne County’s plan indicates that approximately 70%[17] of soils within the county are classified as Prime, Prime if Drained, and Soils of Statewide Importance, and recommends a cap of 1,800 acres for ground-mounted solar development across the county. Herkimer County’s plan recommends undertaking a “county-wide analysis showing places that are suitable and desirable for solar development” based on criteria such as “proximity to three-phase power, slope, environmental features, viewsheds, size of parcel, and agricultural land uses,” as well as identification of important farmlands (Herkimer County Agricultural and Farmland Protection Board 2020).

Dairy Processing Expansions

Committee members, producers, and agribusiness associations pointed to the current and proposed expansion of dairy processing in New York State as a significant new area of agricultural growth that will likely require additional land under active agriculture (see Figure 10). Figure 10 depicts new or expanding dairy processing facilities in New York State and nearby states that we are aware of; it does not represent all dairy processing facilities in the State and the surrounding region. The Fairlife facility under construction in the Town of Webster (Monroe County) and the planned Chobani facility in Rome (Oneida County) are expected to significantly increase demand for milk in the Northeast (New York State 2024).

Agribusiness representatives state that large dairy plants draw from a wide regional area, although milk produced closer to the plants might incur lower shipping costs.[18] This expansion in New York State dairy processing capacity is driving producers to invest more in their operations, including increasing herd size. Committee members expressed concern that solar development could compete with agricultural land needed to serve those herd additions. Farms operating on rented land—or those who rely heavily on rented fields for agricultural activities like crop production and manure spreading—may be more significantly impacted by farmland conversion.

Figure 10. Mid-Atlantic Dairy Processing Expansion

Source: WSP image produced via Gruber (2024) and Mitchell (2024). Additional facilities added in consultation with RAISE Committee members.

Wetlands Protection

Solar developer representatives report difficulties in siting solar facilities on marginal agricultural lands of lower soil quality because the presence of freshwater wetlands and their adjacency areas may trigger State or federal regulations and introduce additional construction hurdles. The New York State Department of Environmental Conservation (DEC) recently finalized a rulemaking that amended the State's freshwater wetlands regulations, which will likely increase the number of State-regulated wetland areas. While the applied effect of the DEC's wetland regulations on solar energy development was not a topic of this study, RAISE Committee members highlighted that steering solar development to marginal agricultural lands will likely increase the probability of encountering wetlands, thus introducing more project risk and costs than solar projects proposed on well-drained and often more productive soils.

State Conservation and Reforestation Initiatives

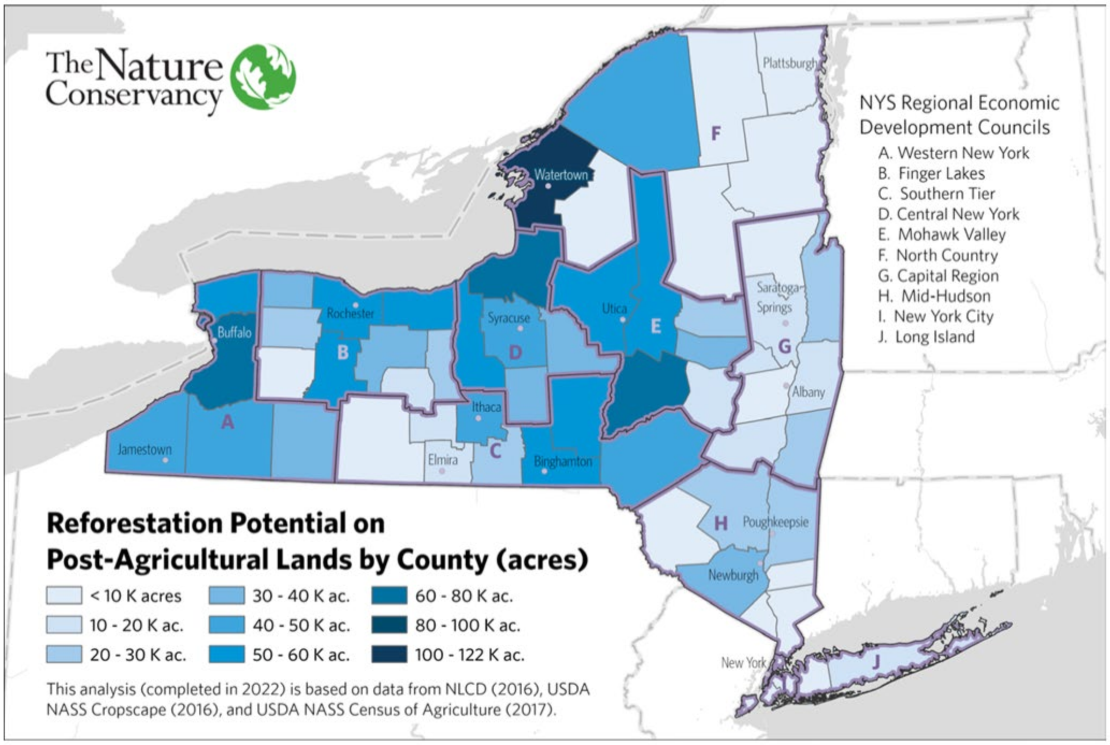
New York State also has ambitious goals to conserve open space, protect watersheds, preserve biodiversity and wildlife migration, increase climate resiliency, and sequester carbon emissions (DEC 2024a). These include statewide commitments to support the national goal of preserving 30% of lands and waters by 2030, planting 25 million trees by 2033, and coordinating efforts to maintain and restore grasslands to address declines in grassland breeding and wintering birds (DEC 2022, 2024b). See Appendix C, Map 7, for details by county of New York State lands within the New York Protected Areas Database.[19]

Goals are often at cross-purposes (such as allowing grasslands to "reforest" versus maintaining them as grasslands), but lands where conservation and climate change mitigation efforts can be implemented may overlap with lands identified for agricultural expansion or preservation, or prospective solar development, or both. For example, a recent publication by The Nature Conservancy and Cornell University detailed the amount of land potentially suitable for reforestation, identifying lands with high reforestation potential as those no longer in agricultural production (see Figure 11). As previously stated, some counties' Agricultural Protection Plans might identify those same marginal or former agricultural lands as potential candidates for solar development. At the same time, opportunities may exist to address multiple goals on the same land, for example, combining solar and agricultural production or integrating conservation approaches into solar project design.

Figure 11. Lands Potentially Suitable for Reforestation by County in New York State

In thousands of acres.

Source: Richardson et al. (2023).



Conservation efforts for grassland protection can be more geographically specific. Solar development proposed in areas used by grassland birds may require mitigation, which can include restoring grasslands on former agricultural land or on land currently being farmed. In the latter case, the mitigation would result in additional loss of farmland outside of the solar facility footprint.

Takeaways: Successful implementation of coexisting State policies for renewable energy development, transmission planning, agricultural market expansion, farmland preservation, wetlands protection, and conservation/reforestation would benefit from enhanced awareness and coordination across stakeholders and interested parties to enable efficiencies, cooperative approaches, and potential (co-)optimization. RAISE Committee members expressed the opinion that plans for transmission expansion should incorporate consideration of areas of high agricultural productivity, and that a continued emphasis on upgrading existing transmission lines, as opposed to evaluating new transmission line construction in less productive agricultural areas of the State, could lead to disproportionate solar development on agricultural lands.

Limitations: The effects of transmission planning, new wetlands regulations, or State conservation and reforestation efforts on solar development or agricultural interests were not analyzed in this study. Additional analyses of land use requirements associated with dairy production—such as land for crop production and nutrient management—would enable a more granular assessment of potential interactions with proposed solar development areas and will be considered for inclusion in future report phases.

4. Impacts and Benefits of Solar Development on the Agricultural Economy

Data from the 2022 New York State Census of Agriculture provide insights into the economics of the New York State agricultural industry. The total number of farms in the State was 30,650 in 2022, a loss of 7,614 farms since 1997 (USDA NASS 2024a). Of that total, 4,992 farms reported net gains of $50,000 or more (USDA NASS 2024a). Of the remaining farms, 7,361 reported net gains of $49,000 or less, and 18,297 farms reported net losses (USDA NASS 2024a). As a result of these patterns, farmers face market and economic uncertainty and may explore opportunities to generate income outside of farming. Understanding the Census of Agriculture data can help developers and landowners understand the economic incentives to lease land for solar.

To explore potential impacts and benefits of solar development on the agricultural economy, WSP conducted a literature review and interviewed representatives of agribusiness and grower organizations.

Results have been summarized by key topic areas, including effects on agricultural land and lease values; local and regional economic effects of solar development; considerations for estimating the economic effects from loss of farmland; and supplemental observations from agribusiness interviews.

4.1 Effects of Solar Development on Agricultural Land Values

Recent research finds that proximity to electrical transmission infrastructure and large-scale solar facilities can increase agricultural land values. Li et al. (2024) found that farmland parcels in the State, particularly large parcels near substations, experience higher valuations after the establishment of the Shared Renewables Program (SRP) in 2015, suggesting that anticipation of future solar development impacts agricultural land values.[20] Authors found that, within a few years of the SRP's passage, large (>10 acres) parcels within 2 miles of substations sold for 15% to 18% more than comparable parcels located farther away. Abashidze (2019) examined the effect of utility-scale ground-level solar installations on nearby agricultural land values in North Carolina and found no direct impact of existing solar facilities on those values, although proximity to transmission infrastructure was associated with higher farmland valuations. A new analysis by Hu et al. (2025) using a nationwide dataset combining 8.8 million property transactions and 3,699 large-scale solar photovoltaic (LSSPV) sites examined the heterogeneous effects of LSSPV on property prices and the associated causal pathways. The analysis indicates that LSSPV increases the value of agricultural or vacant land by about 19.4% within a 2-mile radius, while simultaneously reducing residential property values within 3 miles by about 4.8%.

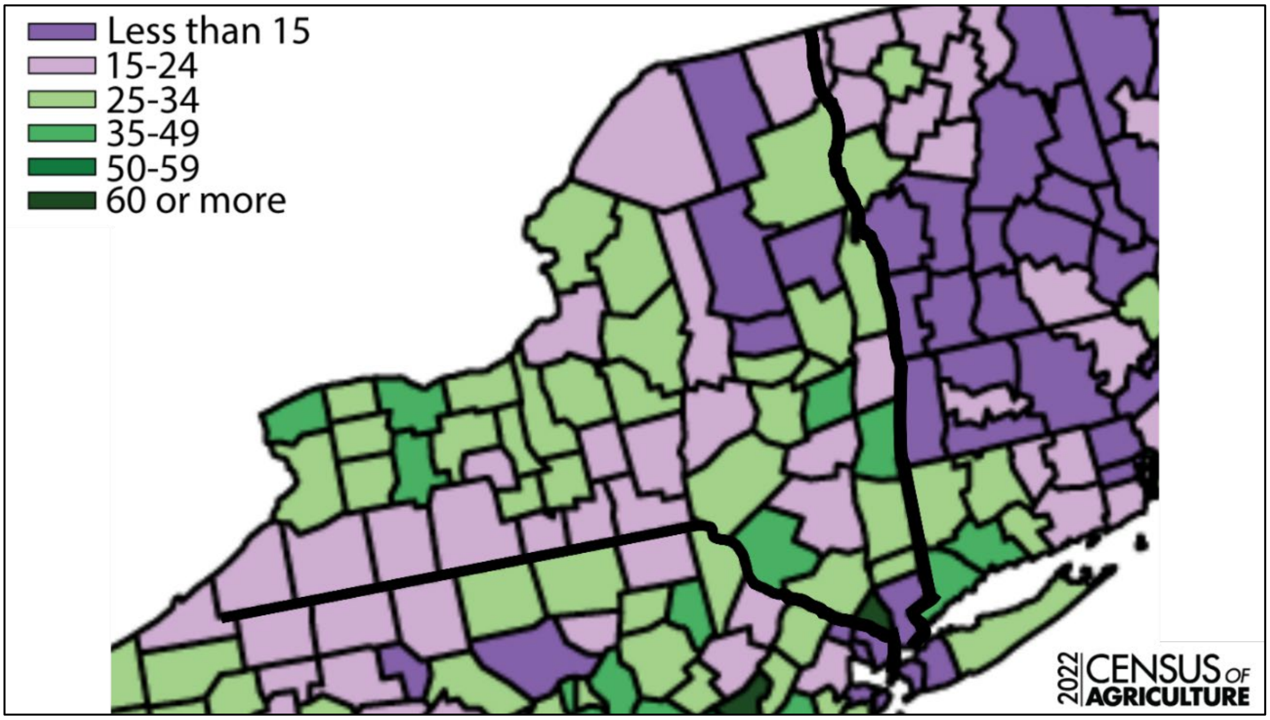
4.2 Effects of Solar Development on Agricultural Lease Values

Solar leases in New York State range from $700 to $2,000 per acre statewide (Hanson 2019, New York State Tug Hill Commission 2023).[21] A survey of solar developers conducted by the Lawrence Berkeley National Laboratory found that solar lease rates in the U.S. ranged from $700 to $1,500 per acre, with a median of approximately $900 per acre (Nilson et al. 2024). By comparison, agricultural rental lease values average $84 per acre statewide, ranging from $27 per acre for pastureland to $170 per acre for irrigated cropland (USDA NASS 2024b).

Studies by Loomis on projects in Wisconsin (2019, 2021) and Ohio (Loomis et al. 2022) indicate solar leases offer higher economic returns for farmers than farming the land, noting that significant increases in crop prices or yields would be necessary to make farming more profitable than solar leases.[22] This finding suggests that the opportunity for solar leases could factor into decisions of whether and/or how best to continue farming for landowners, also considering that revenues may bolster farm businesses by providing cash that landowners can use to invest in their remaining agricultural operations. During a public comment hearing in May 2025 for a utility-scale solar project in Montgomery County, NY, several landowners discussed the benefits of entering into a solar lease, including using solar lease revenue to supplement farm income or to purchase equipment and supplies needed to continue operation (DPS 2023). Landowners who currently rent land for agriculture could seek higher returns from solar leasing, reducing the availability and affordability of farmland (which some RAISE Committee members expressed was already occurring in their areas).[23] According to the 2022 New York State Census of Agriculture, approximately 1.8 million acres of NYS farmland are rented or leased, representing 27% of the State's approximately 6.5 million acres of farmland. Figure 12 depicts the percentage of rented farmland by county based on the 2022 Census of Agriculture data (USDA ERS 2024). Counties with less than 24 percent rented farmland (shaded purple) show higher rates of owned farmland, while counties where 25 percent or more of farmland is rented (shaded green) exhibit higher rates of rented farmland.

Figure 12. Percentage of Rented Farmland by County in 2022

Source:USDA ERS (2024).



Takeaways: Proximity to large-scale solar sites, electric substations, and transmission infrastructure is associated with higher farmland valuations, which may affect the availability of farmland and/or increase the costs of renting or purchasing agricultural lands. Most solar lease rates are higher than financial returns from farming and far higher than those for agricultural production leasing. Landowners who currently lease land for agricultural use may seek higher returns from solar leasing, which could decrease available agricultural land and put upward pressure on agricultural lease rates. This does not account for potential agrivoltaics.

Limitations: Research on the effects of solar development on nearby agricultural land and lease values is limited and constrained by a lack of readily available data. Studies comparing the economic returns of solar energy to those of crop production were based on agricultural operations in other states and thus may not reflect agricultural and financial considerations specific to New York State.

4.3 Local and Regional Economic Effects from Solar Development

This section characterizes known information, gaps, and findings regarding the direct, indirect, and induced economic effects of nonresidential solar development as it may apply to communities in agricultural regions.

4.3.1 Landowner Income from Solar Leases

Data was not readily available to determine whether landowners in New York State who entered solar leases were residents or absentee residents of the solar project locality. Assuming that local landowners would spend more of their dollars locally, understanding of the area of residency will be important in determining how much lease income will affect the local economy. Researchers within and outside the State are actively seeking to characterize solar leaseholders; however, no information was readily available during this analysis. Additionally, broad-scale data were not readily available to determine how farmer landowners who leased a portion of their property to solar development projects may spend their solar lease income, taking into account the offset of revenue by expenditures. One 2022 report by Pace Energy and Climate Center on the Ridge View 350 MW Solar PV Project in the Town of Hartland, Niagara County, commissioned by EDF Renewables (now EDF Power Solutions) estimated that—based on survey responses from 22 farms—of the $1.575 million per year after-tax revenues for participating households (largely made up of family farms), $437,000 would be generated in annual consumption, "at least half of which is expected to be spent locally" on items like food, home renovations, fuel, local recreation, and medical expenses (Hart 2022). RAISE Committee members and agricultural and agribusiness associations reported that some farmers used the solar lease income to invest and sustain their remaining agricultural operations—in particular, those farms without a succession plan or that were not profitable. Other farmers used the solar lease income to retire from agriculture but retained land ownership. Additional information is required to enable any quantitative assessment of potential local or regional agronomic effects resulting from solar lease income.

4.3.2 Revenues to Local Governments

Whether to tax solar development projects and to what degree is an important consideration for project financing and viability. New York State Real Property Tax Law (RPTL) § 487 provides a 15-year exemption from real property taxation on the increase in value attributed to renewable energy systems, including solar.[24] Local taxing jurisdictions may opt out of RPTL § 487, thereby making the system fully taxable (New York State Senate n.d.b.). The NYS Department of Taxation and Finance has developed and updates an annual Solar and Wind Appraisal Model to determine discount rates (Department of Taxation and Finance n.d.b.). Alternatively, taxing jurisdictions may enter into a Payment in Lieu of Taxes (PILOT) agreement. PILOT agreements are annual payments that replace a portion of the property tax revenue a renewable energy project would have otherwise generated. They aim to alleviate the tax burden and uncertainty surrounding tax rates for system owners while retaining some of the revenue that would have been paid in property taxes (NYSERDA 2023b). Another source of revenue for communities can come from host community agreements (HCAs), which are voluntary negotiations between the solar facility owner and the hosting municipality aimed to provide additional benefits to a community outside of the PILOT agreement. These are distinct from the State's Host Community Benefit Program (HCBP), which requires large-scale (≥25 MW) solar facility owners to pay an annual fee of $500 per MW for the first 10 years of project operation, with fees applied toward bill credits to residential electric utility customers within a host municipality (DPS 2022).

The large-scale renewable energy permit process provides some context for understanding the current landscape. Large-scale renewable energy projects (≥25 MW) are required to undergo a review and approval process by ORES.[25] The process requires permit applicants to provide information about intended host community benefits and anticipated PILOT payments a proposed project would provide.

Because limited information is publicly available about anticipated community benefits/payments for projects in the application stage—much of which is largely redacted—a supplemental review targeted public documents from local governments for built projects across the State. PILOT payments for projects highlighted in Table 6 range from $600 per MWac in Albany County to $5,000 per MWac in Schenectady County. This range aligns with rates paid to host communities through PILOT agreements as estimated in a 2024 study by Lawrence Berkeley National Laboratory, which indicated that PILOT payments associated with solar projects can range from $2,800 to $7,600 per MW per year (Nilson et al. 2024). Using an average annual payment of $2,600 per MWac per project, the total PILOT benefit for a 150 MWac project with no escalation over 20 years would be $7,800,000 to the involved taxing jurisdictions. Table 6 also includes first-year HCA payments for projects where such information was readily available.

Table 6. New York State Solar Project Estimated Payment in Lieu of Taxes Payments

Project	MWac	County	Estimated First-Year PILOT Payment	$/MW PILOT	Estimated First-Year $/MW HCA Payments	Source
South Ripley Solar (formerly ConnectGen Chautauqua County LLC)	270	Chautauqua	$742,500	$2,750	$1,750	Town of Ripley and ConnectGen Chautauqua County LLC (2021)
Excelsior Energy LLC	280	Genesee	$1,078,000	$3,850	$2,650	Genesee County Economic Development Center (2016)
Hecate Energy Albany 1 & 2 LLC	40	Albany	$24,000	$600	$2,570	Albany County Industrial Development Agency and Hecate Energy Albany 1 LLC (2022) Albany County Industrial Development Agency and Hecate Energy Albany 2 LLC (2022)
Hecate Energy Cider Solar LLC	500	Genesee	$1,184,899	$2,370	—	Genesee County Industrial Development Agency and Hecate Energy Cider Solar LLC (2024)
Janis Solar, LLC	20	Cortland	$30,000	$1,500	$550	Janis Solar LLC (n.d.)
Morris Ridge Solar Energy Center LLC	177	Livingston	$380,550	$2,150	$1,187	Town of Mount Morris and Morris Ridge Solar Energy Center, LLC (2022)
Pattersonville Solar	20	Schenectady	$100,170	$5,008	—	PARIS (2024).

While public information on tax or PILOT payments is limited, host municipalities often invest in public services, and some counties are exploring using PILOT funds and policies to protect farmland. For example, Wayne County's Agricultural and Farmland Protection Plan and Lewis County's Agriculture and Farmland Enhancement Plan recommend using PILOT funds to support agricultural conservation easement purchases (Wayne County Agricultural Development Board 2023; Lewis County Agriculture and Farmland Enhancement Plan Steering Committee 2021). Along those lines, the New York State Tug Hill Commission (2023) suggests that industrial development agencies structure PILOTs to encourage development on marginal land through financial incentives.

4.3.3 Estimating Economic Effects from Solar Development

Utility-scale solar project siting permit applications[26] require an assessment of a proposed solar project's socioeconomic impacts, including estimated workforce, payroll, and expenditures during construction and operation of the facility; estimated operating or infrastructure costs incurred for municipalities, public authorities, utilities, and school districts during construction and operation of the facility; and expected tax revues (including other payment opportunities such as PILOT) generated by the facility.

Solar developers and economists often use modeling tools to estimate the potential economic impacts of solar development at the State and local level (e.g., Loomis 2019, 2021; Loomis et al. 2022). For instance, the Jobs and Economic Development Index Solar Photovoltaics (JEDI PV) model, created by the National Renewable Energy Laboratory (NREL), is an open-source computer program developed to allow users to estimate the economic impacts (e.g., jobs, earnings, and economic output) from constructing and operating solar facilities (NREL n.d.; Michaud et al. 2020). The JEDI PV model uses State-specific industry multipliers obtained from Impact Analysis for Planning (IMPLAN), a widely used software model for tracking dollar flows between sectors of the economy and estimating how those dollars generate additional economic activity (sometimes referred to as "economic multipliers"). To model the economic impacts of a specific solar project using JEDI PV, solar developers can input county-level and project-specific information into the software to generate estimates of the economic effects resulting from the project's construction and operation.

The JEDI PV model is used in some State solar developers' Article VIII applications to address the requirements of New York Codes, Rules and Regulations § 1100-2.19. Table 7 provides examples of JEDI PV projections for full-time employment jobs and local expenditures in the State generated during construction and operations for two solar projects. The JEDI PV model estimates jobs directly created by the project (i.e., construction laborers and electricians), as well as those created through indirect and induced impacts.[27]

Table 7. JEDI PV Projections for New York State Solar Project Applications

Source: East Point Energy Center, LLC (2019) and Excelsior Energy Center, LLC (2020)

East Point Energy Center (50 MW, Schoharie County)

Construction Impact Type	**Number of Construction NYS FTE Jobs Created**
Direct	54.6
Indirect	16.5–18.2
Induced	17.3–19.1
Total	**88.4–91.9**
Total NYS Expenditures	**$8,832,736**
Operations Impact Type	**Number of Operations NYS FTE Jobs Created**
Direct	2.5
Indirect	1.1–1.2
Inducted	2.0–2.2
Total	**5.6–5.9**
Total NYS Expenditures	**$709,461**

Excelsior Energy Center (280 MW, Genesee County)

Construction Impact Type	**Number of Construction NYS FTE Jobs Created**
Direct	290.2
Indirect	92.3–102.0
Induced	85.6–94.6
Total	**468.1–486.8**
Total NYS Expenditures	**$47,236,801**
Operations Impact Type	**Number of Operations NYS FTE Jobs Created**
Direct	3.1
Indirect	1.8–2.0
Inducted	4.9–5.4
Total	**9.8–10.5**
Total NYS Expenditures	**$935,167**

The JEDI PV model does not capture or analyze economic activity that might be lost or diminished by a proposed solar development, such as the potential displacement of jobs and agricultural outputs that previously occurred on the property. Economists are evaluating options to better account for these economic effects. For example, Cox (2023) explored four policy options to improve economic impact analyses of solar projects proposed on agricultural or forested land in Virginia. Considering the JEDI model's benefits—accessibility, moderate accuracy, and low end-user costs—Cox recommends expanding it to capture agriculture- and forestry-related economic effects. Characteristics and information gaps associated with the economic effects of agriculture are discussed in Section 3.4.

Takeaways: Assessing the net local and regional economic effects of solar development is difficult. While off-shelf models exist to measure the economic contributions of new solar projects (e.g., in the form of taxes, PILOTs, and employment), we currently lack tools to easily analyze potential losses of displaced economic activity, such as agriculture. Solar project taxes and PILOT agreements provide a steady revenue stream that localities often use to invest in public services. Counties are considering PILOT incentives to steer the siting of solar development. Solar projects are estimated to bring local economic benefits through employment opportunities and to increase demand for local goods and services during project construction, and to a lesser extent, during project operation. Drawing on lessons from studies currently underway that explore the economic and social impacts of solar projects in farming communities will be important.

Limitations: Information was not readily available to characterize the proportions of solar leaseholders and landowners that were nonresident or absentee, nor how farmer landowners spend their solar lease payments in New York State, representing significant gaps in understanding the economic effects of solar development on agriculture. Economic models may not reflect the actual economic effects of a project. Additionally, publicly available socioeconomic exhibits under Article VIII are largely redacted, limiting the ability to glean insights from the provided information.

4.4 Estimating Economic Effects from Farmland Loss

RAISE Committee members expressed concern that farmland taken out of production could have a ripple effect on regional agribusiness and related services, due to reduced agriculture-related purchases and employment, and counties with less diversified economies may be more vulnerable to the associated economic impacts. Committee members also raised the prospect that concentrated loss of farmland within a county or region would cause farm businesses and service providers to cease operations in those areas. The following section summarizes the economic contributions of agriculture in the State and findings from efforts to quantify economic thresholds and impacts associated with the loss of agricultural activity.

4.4.1 Economic Attributes of New York State Agriculture

Agricultural economists at Cornell University have developed statistics on the economic contributions of specific activities within the agricultural production, support services, and manufacturing sectors in the State (Schmit 2025). IMPLAN economic modeling was used to estimate each sector's direct, indirect, and induced economic contributions. Direct effects are a measure of the value of agricultural outputs, employment, labor income, and other economic activity, such as taxes paid. Economic interrelationships or "linkages" are strong within the agricultural sector. For example, Figure 13 illustrates the additional investments generated by a hypothetical new ice cream processor.

Figure 13. Example of Economic Linkages within the Dairy Sector

Source: Schmit (2025), Cornell University, unpublished figure.

The additional economic activity and employment generated by these business-to-business linkages are referred to as indirect effects. The final category of economic activity—induced effects—represents economic activity from the spending of labor income from those directly and indirectly created jobs. Characterizing the indirect and induced effects helps economists calculate the economic multiplier—an estimate of how many dollars of additional economic activity would result from a dollar of spending or output in that sector. Table 8 lists economic contributions from the State's five agricultural production and manufacturing sectors with strong economic multiplier effects.

Table 8. Economic Contribution of Combined Production and Manufacturing Sectors, New York State, 2023

Source: Schmit (2025); Author calculations using IMPLAN (2024).

Economic Metric & Industry Output ($ million)	Direct	Indirect	Induced	Total	Multiplier
Fruits and Vegetable	4,309	1,419	1,376	7,103	1.65
Grains and Oilseeds	2,839	1,076	571	4,486	1.58
Dairy	13,777	4,330	2,401	20,508	1.49
Meat and Seafood	3,388	724	682	4,794	1.41
Forestry	5,389	1,988	1,177	8,554	1.59
Employment (Average mo. jobs)					
Fruits and Vegetable	21,678	5,638	6,628	33,944	1.57
Grains and Oilseeds	14,866	4,671	2,751	22,288	1.50
Dairy	24,508	17,424	11,587	53,519	2.18
Meat and Seafood	13,797	2,714	3,287	19,798	1.43
Forestry	11,731	6,947	5,673	24,352	2.08
Labor Income ($ million)					
Fruits and Vegetable	1,451	503	513	2,467	1.70
Grains and Oilseeds	443	378	213	1,034	2.33
Dairy	1,966	1,537	896	4,399	2.24
Meat and Seafood	719	255	255	1,229	1.71
Forestry	1,041	684	439	2,164	2.08

This study focused on characterizing the potential economic impacts of lost farmland production and use; therefore, these economic multipliers (and detailed linkages to other sectors) can provide a strong starting point for subsequent analyses.

4.4.2 Studies on Critical Mass of Farmland

The "critical mass" concept in agriculture refers to the minimum levels of farmland and commodity production needed for a regional agricultural economy to remain viable. While the critical mass concept has been a significant focus in farmland protection efforts, it is not well established in the literature, and efforts to quantify critical mass thresholds are sparse. Summarized below are the most relevant studies that might inform future RAISE Committee efforts at characterizing critical mass effects.

Carpenter and Lynch (2002) examined the historical rates of farmland and farm loss at the county level for six mid-Atlantic states (including New York State) over 50 years. Between 1949 and 1977, the authors identified a relationship between a county's harvested acres or agricultural sales and the rate of farmland loss, as well as a minimum acreage threshold below which the rate accelerates. However, no similar relationship was found between 1978 and 1997. The authors noted influences by nonfarm factors such as technology adoption, crop diversification, and taxation rates.

Nousaine and Jolley (2013) analyzed four counties in western North Carolina for the existence of an agricultural production threshold below which agricultural support industries would close or relocate outside the region. Through a series of interviews, they found that most agricultural support industries would not be significantly affected by reductions in local agricultural output, given their large service areas and diversified client bases. However, interviewees identified three service industries that might be at risk: regional cattle stockyards and auction houses, heavy equipment and tractor dealerships, and agricultural extension services. The authors used an IMPLAN model to estimate the economic effects of potential reductions in the number of heavy equipment and tractor dealerships. They discussed other qualitative impacts that dealership closures might have on farmers, such as loss of equipment servicing.

Brown et al. (1993) conducted a series of interviews with farm-support businesses located in New York State's St. Lawrence River Valley to understand the potential economic impacts that might result from creating a national wildlife refuge on approximately 21,000 acres, approximately 13,000 acres of which were in active crop, hay, or pastureland. Survey results indicated that farms within the proposed refuge footprint supported about 55 farm-support-business employees and that approximately $7 million in gross business activity was also linked to those farms. About half of the farm-support businesses believed that, if created, the refuge would have a substantial adverse impact on their businesses, although most felt that they would manage to stay in business.

4.4.3 Economic Modeling on the Effects of Farmland Loss from Solar Projects

This section outlines four economic modeling studies that captured various aspects of foregone agricultural activity resulting from hypothetical or proposed solar projects.

Hypothetical Solar Development on a Citrus and Melon Farm in Florida

Fenimore et al. (2023) compared the economic and fiscal impacts of two hypothetical 500-acre solar projects in Florida against the loss of agricultural activity from constructing those projects on a citrus and melon farm, respectively. The study used USDA county-level census data to estimate the agricultural production value for each farm and, using an IMPLAN model, estimated employment, labor income, economic contributions to county GDP, and taxes that would be lost from cessation of farming operations. The authors compared their findings with the economic benefits of solar construction and operation. Both project scenarios found 10-year net positive effects from solar projects exceeding $20 million in county GDP, as well as significant increases in labor income and tax revenue compared to farming. Notably, the estimated employment loss at the melon farm exceeded the estimated employment gain during the solar operation phase.

Partial Solar Development of Corn, Soybean, and Wheat Production in Niagara County, NY

In association with the proposed Ridge View Solar project in the Town of Hartland, NY, Pace Energy and Climate Center evaluated how solar development on a portion of hypothetical 100-acre, 500-acre, and 1,000-acre mixed corn, soybean, and wheat production might help diversify revenue and help farmers manage commodity or price risks (Hart 2022). Converting 20% of the farm to solar was determined to be more profitable for the 500-acre farm, but returned roughly equal profits for the 1,000-acre farm. A sensitivity analysis found that dedicating 20% of the farm to solar power significantly stabilizes farmers' net revenues during market fluctuations. For example, if commodity prices were reduced by 50%, annual farming profits would be estimated at $16,055, compared with $112,844 under the partial solar scenario. The additional economic effects of solar leases on the community were estimated, and landowner surveys were conducted to identify potential consumer savings and spending categories.

Partial Solar Development on Corn and Soybean Production in Wisconsin

Using enterprise budgeting models, Dean (2019) sought to illuminate the economic benefits of converting half of a hypothetical, approximately 140-acre corn or soybean farm in Wisconsin to solar production. The study finds that converting half of the farmland from corn to solar or from soybeans to solar would result in 75% and 50% increases in land economic productivity, respectively, as measured by net revenue. However, the model appears to capture only the economic effects on the farmer receiving annual solar lease payments and on local governments receiving revenue-sharing payments. Lost revenue from corn or soybean production is accounted for, but the economic activity lost due to reduced agricultural output is not discussed.

Excelsior Energy Center (Genesee County, NY) Agricultural Impact Study

In the Excelsior Energy Center proceeding, one party commissioned and filed an agricultural impact study to estimate the potential impacts of farmland loss from the proposed 1,700-acre project. The complete study is not publicly accessible through the regulatory proceeding; however, a public rebuttal offers a window into its approach.

Using an IMPLAN model, the study estimated the effects of foregone agricultural activity and associated direct, indirect, and induced economic effects resulting from the loss of farmland use and productivity. The study authors appear to have estimated the loss in crop production and associated market values based on recent plantings and the economic effects of an adjacent dairy farmer's potential decision to reduce herd size because the solar project would occupy land previously used for nutrient management (manure spreading). The downstream economic impact on a dairy cooperative from an assumed loss of milk supply was also estimated. Among other issues, the rebuttal party objected to the failure to account for the economic benefits to the landowner and the associated reinvestments into farmland holdings that are not part of the solar project.

Outside the studies above, no analogous efforts by parties in other State solar project proceedings are known. The State's utility-scale solar siting regulations require an assessment of "active agricultural businesses and/or facilities and all related infrastructure" within a 5-mile radius of the solar project area.[28] A review of filings from nine projects found that those exhibits typically describe the county-level agricultural economy using USDA Census of Agriculture data, such as the number or acreage of farms within a 5-mile radius, farm businesses, and characteristics of agriculture in the area.

Takeaways: Additional research is needed to more fully understand the regional economic impacts of solar development. Robust data exists on the economic contributions from the State's various agricultural sectors. While limited, previous attempts to identify a critical mass of farmland to sustain regional agricultural services were documented. Economic modeling of hypothetical and proposed impacts on agriculture from solar projects has also been performed, including two models based on New York State projects. Together, these economic analyses may provide a roadmap for subsequent analyses to characterize a range of economic effects from potential solar development on a regional scale.

Limitations: Public commentary on and reports related to the regional economic impacts of solar development are limited; additional data may become available as solar development siting permit applications become public and may be surfaced by developers outside the permit process.

4.5 Agribusiness Observations of Solar Development

To better understand agribusiness perspectives on how increasing solar development in the State may impact agriculture and related agricultural value chain activities, representatives from various agribusiness and grower associations were interviewed in 2024, including the New York State Agribusiness Association, American Association of Bovine Practitioners, Northeast Dairy Foods and Suppliers Association, Northeast Agribusiness and Feed Alliance, New York State Vegetable Growers Association, New York Apple Association, and Northeast Dairy Producers Association. Their input has been reflected throughout this report. In general, interviewees have not observed any impacts of current or prospective solar development on their businesses, though some dairy farmers report that competition for land from solar development is a concern. Labor and environmental issues, as well as industry trends, such as farm consolidation and vertical integration in the farm-input sector, were reported to be impactful. Energy reliability and access to three-phase power have been reported as challenges for dairy processing plants and farms seeking modernization and expansion. In addition, State policies pertaining to agriculture and the electrification of the trucking sector were reported as having a current or prospective impact on their agribusinesses. Additional interviews and socioeconomic research at the regional scale may further illustrate any agribusiness effects from solar.

5. Conclusion: Preliminary Key Takeaways

This report summarizes Phase 1 of RAISE Committee–informed efforts to advance understanding of the potential land use implications of solar development on the State's agricultural economy, including the identification of regions that may be more prone to concentrated solar development. As work with the RAISE Committee continues, additional efforts to explore the intersection of agriculture and renewable energy development in New York State must consider driving forces of change in both agriculture and renewable energy sectors, the policy environment that influences change in each sector, and continued exploration of the mechanisms and methodologies that enable exploration of future scenarios, with the intent of advising on pathways that recognize and account for tradeoffs while stimulating reliability and growth.

The following section outlines preliminary takeaways on land use trends and the impacts of solar energy development, discusses key information gaps by section, and poses key questions and recommendations for future efforts.

5.1 Land Use Trends from Solar and Nonsolar Development

Analysis suggests rural land is under pressure from industrial and residential development that fragments former contiguous farmland. Solar development introduces new development patterns in rural areas that differ from patterns associated with sprawl in urban areas. The new development patterns largely follow proximity to transmission lines, particularly for utility-scale solar projects, which typically require interconnection with higher-voltage transmission lines.

Analysis of a subset of existing solar facilities found that 62% to 76% of their acreage was on agricultural land, with 41% on MSG 1–4 highly productive soils (which encompass all land use types and are not exclusively agricultural). A total of 32% of that solar development occurred on MSG 1–4 highly productive soils on agricultural land. Other hay/nonalfalfa, field corn, alfalfa, soybeans, grassland/pasture, and winter wheat were the predominant agricultural land prior to solar project development. The analysis does not account for the potential to integrate agrivoltaic activities within built projects. More than 40% of statewide NLCD agricultural land, MSG 1–4 on agricultural land, and referenced crop acres statewide are within transmission line corridors. Of note, future development trends may not follow existing patterns; future analysis will draw on a broader data pool of built projects and may explore impacts from agricultural mitigation policies.

Our analyses indicate an association between agricultural land within transmission line corridors in a county and proposed solar development; generally, counties with the most agricultural land within transmission line corridors also have the most proposed solar capacity within the NYISO and SIR. At the statewide level, proposed solar projects' interconnection queues may displace up to 1.5% of total agricultural land, assuming historical siting patterns continue and no co-utilization with agriculture. This is an overly conservative estimate, recognizing that entry into the queue does not presume projects will be built, and that a significant rate of attrition exists. Certain counties with more proposed solar projects could experience higher percentages of agricultural land conversion within their borders.

5.2 Impacts and Benefits of Solar Development on the Agricultural Economy

Solar lease rates are considerably higher than agricultural lease rates and may yield higher financial returns than field-crop production. Research indicates that farmland parcels close to large-scale solar sites, electric transmission lines, and substations are associated with higher valuations (Li et al. 2024; Abashidze 2019; Hu et al. 2025). Farms operating on rented land—or those who rely heavily on rented fields to support agricultural activities like crop production and manure spreading—may be more significantly impacted by farmland conversion. Rates of rented farmland vary across the State, so some counties could see more impact than others.

A review of select PILOT agreements and HCAs provided insight into the range of revenue that host municipalities may receive from large-scale projects. Several county-specific Agricultural Protection Plans suggest using PILOT funds to support agricultural conservation easements.

While tools have been developed to model the economic impacts of solar developments in communities (e.g., the JEDI PV model), no similar tools exist to estimate the local and regional economic effects of agricultural activities or their loss. Because no tool exists to estimate the impacts of lost agricultural activity, creating a "net" estimate of the economic impacts of solar on agricultural land use is difficult.

The agricultural industry's contributions to the State's economy are well documented, and attempts have been made to identify a "critical mass" of farmland needed to sustain regional agricultural services. These, along with economic modeling studies that capture the impacts of solar projects on agriculture, may provide a roadmap for future analyses to help characterize the potential regional economic effects of solar development.

5.3 Key Information Gaps

In addition to the limitations and information gaps identified in previous sections, this section highlights further gaps that may inform future work.

5.3.1 Land Use Trends from Solar and Nonsolar Development

A primary goal of the land use analyses is to identify regions that are experiencing, or are more likely to experience, concentrated solar development. To refine the list of regions that may warrant deeper analysis, additional data and information are needed.

The scale and location of built and planned solar development. Spatial data on the 61% of built solar projects we currently lack, as well as more refined data on planned projects that are likely to be built (understanding that analysis to date has focused on projects in the queue, which may or may not reach construction), will improve understanding of existing solar development and land conversion trends, and improve projections for future solar development.

Existing electric transmission infrastructure and upgrade plans. More granular data on electric transmission infrastructure and upgrade plans is needed to help predict where future solar development may occur.

Land requirements for sustaining and growing the State's agricultural economy. Acres under Nutrient Management Plans, for example, by county, can help elucidate land requirements for dairy operations. Preliminary analysis currently assumes 2 acres per cow, based on estimates provided by Cornell University.

County-level metrics for agricultural–economic contributions. A metric for comparing counties by the proportion of agriculture-dependent industry can help to better characterize potential regional effects from the loss of agriculture.

Future agricultural production trends. This analysis projects forward for solar development, but the agricultural context remains static; it does not account for future trends in agriculture, such as expansion associated with dairy processing capacity, or agrivoltaic opportunities that may affect agricultural land use and type, or potential demand-side influences that could drive changes to the State's agricultural makeup and economy. Additionally, climate change will affect the type and methods of agricultural production in the State over the coming decades. For example, key findings from the Agriculture chapter of the *New York State Climate Impacts*

*Assessmen*t note that climate impacts—including extreme precipitation, short-term drought, heat stress, warmer winters, late spring freezes, increased pest pressures, and increased production costs—are a threat multiplier, exacerbating existing stressors like tight profit margins and labor shortages (Aller et al. 2024). More information about how farmers are adapting to climate and industry trends can help to characterize future land requirements.

5.3.2 Impacts and Benefits of Solar Development on the Agricultural Economy

To better understand the tradeoffs of solar development related to the State's agricultural industry, additional data and information are needed to understand:

How solar lease payments are spent by farmer landowners. From an economic perspective, farmers who reinvest solar lease payments into their farms may improve viability and/or diversify agricultural activities, while contributing to local agricultural economies. In contrast, absent or retired farmers would reduce agricultural spending.

The impact of solar leases on landowners and farmers operating on rented ground. From a landowner's perspective, how does the loss of the agricultural assessment[29] benefit impact the financial benefits incurred from solar lease payments? How are tenant farmers impacted by agricultural land conversion?

The regional economic impacts of agricultural land loss. What tools or methods can be developed and used to help evaluate the complex economic interactions and effects related to agricultural land loss scenarios in a more regional context?

5.4 Key Questions and Recommendations for Further Study

Each section of this report underscores the need for ongoing investigation into the impact of solar development on the State's agricultural economy, to better characterize the relationships among land use, agricultural productivity, and regional economic activity. Key questions and recommendations for further study include:

- What identifiable metrics associated with agricultural land conversions in a region result in threshold impacts to the local agricultural economy, particularly for agricultural support businesses or manufacturers?
- How can co-utilization within a solar facility mitigate potential impacts on existing agricultural activities?

- Where is future solar development most likely to occur, and at what scale? While this report sheds light on this question, the location and scale of future solar development are influenced by factors not analyzed here; continued investigation can help characterize the potential for regional agronomic impacts.
- Where do opportunities exist to increase solar development while avoiding impacts on agriculture (e.g., siting facilities on abandoned and vacant agricultural lands, using agrivoltaics)?
- What impacts does solar development have on agricultural districts, and how effective are mitigation measures intended to disincentivize solar in agricultural districts?

Potential actions for Phase 2 of the RAISE Committee's continued investigation include:

- **Refine the understanding of existing solar developments, historical land conversion trends, and areas of potential future solar development.**
    - Improve understanding of future solar development based on transmission upgrade plans and advanced project status in the queue, including projects that (1) have undergone NYISO's class year studies and accepted class year allocations; (2) have applied for or received a siting permit; and (3) have offtake contracts.
    - Consider land use estimates based on trajectories for achieving State renewable energy targets.
- **Refine the understanding of agricultural land use trends by county and region, accounting for future trends in agriculture.**
    - Identify current acreage included in Nutrient Management Plans by county to better understand land requirements for dairy operations.
    - Aggregate information about planned dairy facility expansions to better understand potential changes to land requirements for the dairy industry.
    - Review regional dairy cow acreage requirements to supplement a county-level analysis and ensure linkages across regions; identify a regional boundary framework most relevant to the dairy industry.
    - Identify opportunities to integrate additional policies and pressures that may influence farming trends in the State.
    - Continue analysis of statewide MSG 1–4 soils, excluding the built environment, to support an understanding of the acreage of highly productive soils available for agricultural production.
    - Track emerging co-utilization and agrivoltaic opportunities that may influence land constraints for solar and agriculture.

    - Consider analyzing characteristics of converted agricultural land, including land productivity factors, to enhance understanding of land conversion trends.
    - Determine how to take climate considerations into account to understand potential future trends in agriculture.
- **Refine the understanding of intersecting State policies and associated drivers to inform improved coordination and decision-making toward multiple policy goals.**
    - Analyze and map, where possible, intersecting land use scenarios (e.g., environmental and wetland conservation, renewables development, agriculture preservation, carbon sequestration).
    - Explore opportunities, technologies, and methods to enhance coordination, such as decision-support tools.
- **Continue to identify and evaluate study approaches for assessing solar development effects on regional agricultural productivity and economies.**
    - Identify and develop appropriate metrics for comparative analysis of agricultural economy-dependent industries.
    - Determine how to measure the degree of economic dependence on agriculture and associated opportunities to integrate economic diversity on a county or regional level.
    - Address key socioeconomic information gaps regarding solar leaseholder residency and agriculture-related spending.
    - Identify and address analytical gaps to advance understanding of potential threshold effects on agricultural sectors from concentrated solar development.
    - Conduct additional spatial and socioeconomic analyses of solar energy built or proposed in agricultural districts to identify driving forces and trends.
    - Continue exploration of how PILOT and host community agreement funds may affect agricultural communities.

Together with additional State efforts to understand land use implications of solar development, further studies can inform potential actions related to renewable energy infrastructure siting and support efforts to minimize impacts on the State's agricultural economy.

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Appendix A. RAISE Purpose

The New York State Agricultural Technical Working Group (A-TWG) is an independent advisory body that informs efforts to develop solar energy across a range of scales in a way that supports the State's agricultural operations, lands, farmers, and communities. A-TWG comprises farmers and agriculture advocates, solar developers, academic experts, nongovernmental organizations (NGOs), and State agencies.

The RAISE Committee is a subset of A-TWG that identified the following purpose statement:

> In 2022, the State Farmland Protection Working Group recommended the State initiate a study, to determine the potential benefits and/or burdens of renewable energy development related to New York's agricultural industry. NYSERDA has convened a Specialist Committee under the A-TWG to assist NYSERDA to undertake a study or studies to assess the impact of solar development on the agricultural economy in the State. The study will inform State and regional policy, and will include an assessment of land use conversions, economic pressures, and other factors. The RAISE Committee shall:
>
> 1. Advise on developing scope(s) of work and associated study methodologies.
> 2. Identify information, data, and resources helpful to undertaking associated agricultural, economic, land use, and other analyses.
> 3. Make recommendations on undertaking additional studies or actions (NYS A-TWG 2024).

The RAISE Committee reports its findings and recommendations to the A-TWG.

Appendix B. New York State Developed Solar Acres Methodology

The methodology described below was used to estimate acres of constructed solar projects across the State. Two datasets were used: New York Independent System Operator (NYISO) and Statewide Distributed Solar.

The Statewide Distributed Solar Projects Beginning 2000 to 2025 (accessed on February 11, 2026) spreadsheet, available at https://www.nyserda.ny.gov/All-Programs/NY-Sun/Solar-Data-Maps/Statewide-Distributed-Solar-Projects, was used to estimate acreage for projects that were not mapped. A total of 17,074 acres was estimated by applying an assumption of 5 acres per MWac system capacity.

1. Selected only those projects with a system capacity of ≥1 MWac, to ensure comparability with the U.S. Large-Scale Solar Photovoltaic Database (USPVDB) dataset. The field PV System Size (kWac) was used to filter projects ≥1,000 kWac.
2. Four projects classified as utility scale were already included in NYISO's 2025 New York Control Area (NYCA) dataset; therefore, these were excluded to avoid double-counting:
    - March 3, 2018, Public Service Enterprise Group–Long Island (PSEG–LI), Suffolk County, 20,000 kW
    - July 1, 2018, PSEG–LI, Suffolk County, 24,900 kW
    - November 11, 2011, PSEGLI, Suffolk County, 31,500 kW
    - May 31, 2016, PSEG–LI, Suffolk County, 9,500 kW
3. Added a field, *AcresCalculated*, to estimate project acreage
4. Calculated acreage using the formula: *PV System Size kWac / 1,000 x 5 acres*
5. Used the *Interconnection Date* field to derive and manually assign a corresponding *Year* field.
6. Created a pivot table summarizing total *AcresCalculated* by year.

The NYISO 2025 NYCA Existing Generating Facilities spreadsheet was used to identify operating utility-scale solar facilities in New York State. This dataset was used to estimate acreage for facilities that were not mapped. A total of 2,992 acres was estimated by applying an assumption 5 acres per MWac of system capacity.

1. Tabs titled "Table III-2a" and "Table III-2b" were filtered to include only units with a *Unit Type* coded as photovoltaic (PV).

Table B-1. Combined Acreage Estimates from NYISO, NYCA, and Statewide Distributed Solar Datasets

NYISO PV Unit Type, by Year	
Year	**Acres**
2011	158
2012	—
2013	—
2014	—
2015	—
2016	—
2017	—
2018	125
2019	—
2020	—
2021	100
2022	315
2023	300
2024	1,995
2025	—
Total	**2,992**

Statewide Distributed Solar ≥1 MW Acres, by Year	
Year	**Acres**
2011	10
2012	42
2013	23
2014	45
2015	152
2016	178
2017	452
2018	680
2019	1,030
2020	1,353
2021	2,042
2022	2,134
2023	2,078
2024	3,557
2025	3,298
Total	**17,074**

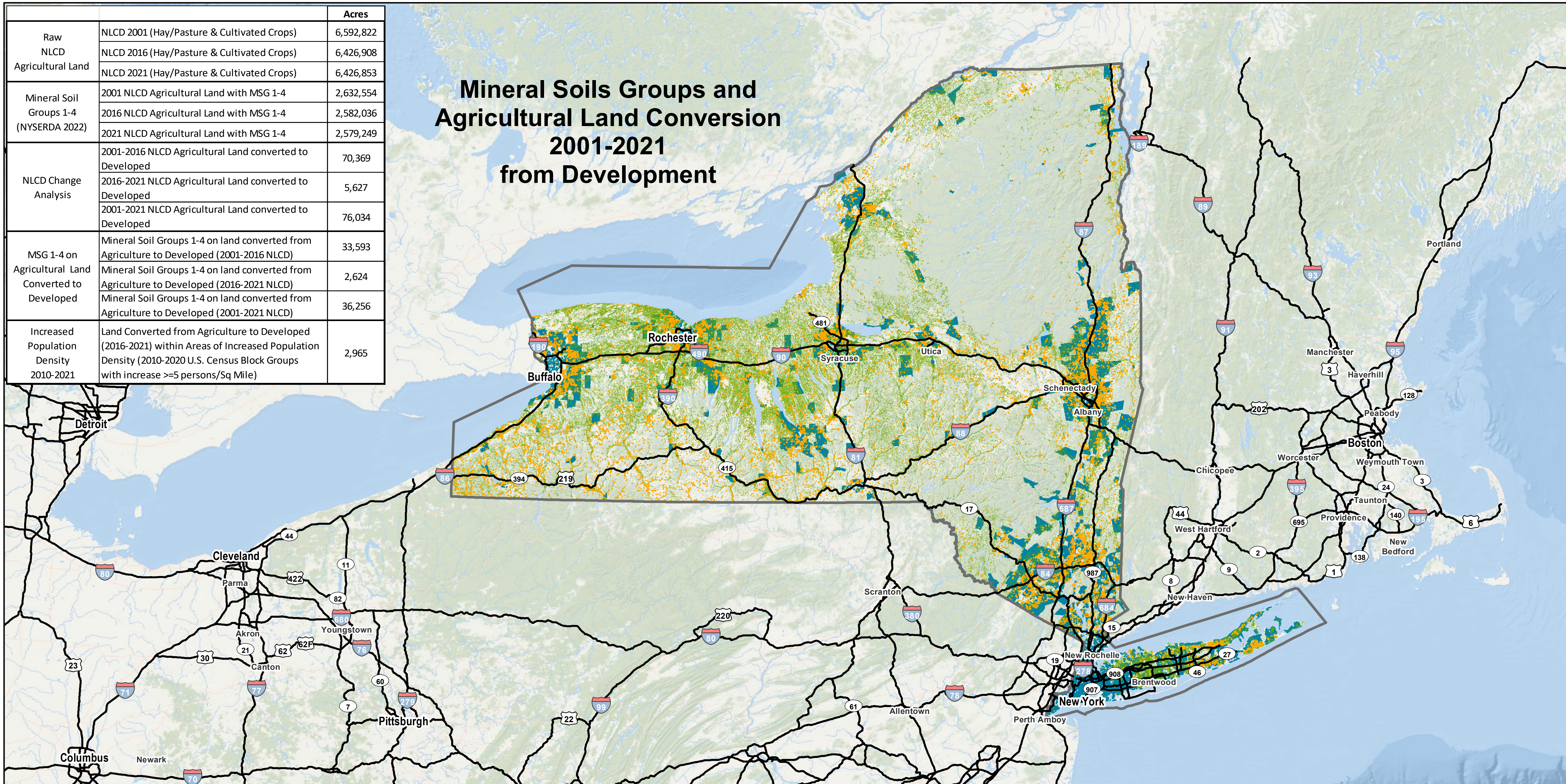
Total Solar Developed Acres, 2011–2024	
Year	**Acres**
2011	168
2012	42
2013	23
2014	45
2015	152
2016	178
2017	452
2018	805
2019	1,030
2020	1,353
2021	2,142
2022	2,448
2023	2,378
2024	5,552
2025	3,298
Total Acres	**20,066**

Appendix C. Maps

Maps and data depicted in Appendix C were produced iteratively in the course of supporting RAISE Committee's exploration of data and data visualization that provides insights into the intersection of agriculture and solar.

		Acres
Raw NLCD Agricultural Land	NLCD 2001 (Hay/Pasture & Cultivated Crops)	6,592,822
	NLCD 2016 (Hay/Pasture & Cultivated Crops)	6,426,908
	NLCD 2021 (Hay/Pasture & Cultivated Crops)	6,426,853
Mineral Soil Groups 1-4 (NYSERDA 2022)	2001 NLCD Agricultural Land with MSG 1-4	2,632,554
	2016 NLCD Agricultural Land with MSG 1-4	2,582,036
	2021 NLCD Agricultural Land with MSG 1-4	2,579,249
NLCD Change Analysis	2001-2016 NLCD Agricultural Land converted to Developed	70,369
	2016-2021 NLCD Agricultural Land converted to Developed	5,627
	2001-2021 NLCD Agricultural Land converted to Developed	76,034
MSG 1-4 on Agricultural Land Converted to Developed	Mineral Soil Groups 1-4 on land converted from Agriculture to Developed (2001-2016 NLCD)	33,593
	Mineral Soil Groups 1-4 on land converted from Agriculture to Developed (2016-2021 NLCD)	2,624
	Mineral Soil Groups 1-4 on land converted from Agriculture to Developed (2001-2021 NLCD)	36,256
Increased Population Density 2010-2021	Land Converted from Agriculture to Developed (2016-2021) within Areas of Increased Population Density (2010-2020 U.S. Census Block Groups with increase >=5 persons/Sq Mile)	2,965

Mineral Soils Groups and Agricultural Land Conversion 2001-2021 from Development



NLCD Analysis - Agriculture Land Converted to Development (Developed Open Space, Low, Medium, & High Intensities) 2001-2021 (removed areas <1 pixel size for visualization)

Mineral Soil Groups 1 to 4 (NYSERDA 2022)

Population Density Increase 2010 to 2020, U.S. Census (>=5 persons/sq. mile)

* Symbols are not to scale.

Note- Ag land converted to development only captures roughly 100 acres of solar.

Sources: NLCD 2001, 2016, 2021; Mineral Soils Groups from NYSERDA (2022); ESRI base data and US Census data 2021.

Coordinate System:
State Plane New York Central
NAD 1983

December 1, 2025

wsp

Map 1
Mineral Soils Groups and Agricultural Land Conversion 2001-2021 from Development

GIS AGRICULTURE LAND CONVERSION ANALYSIS 2001-2021
NEW YORK STATE ENERGY RESEARCH
AND DEVELOPMENT AUTHORITY (NYSERDA)

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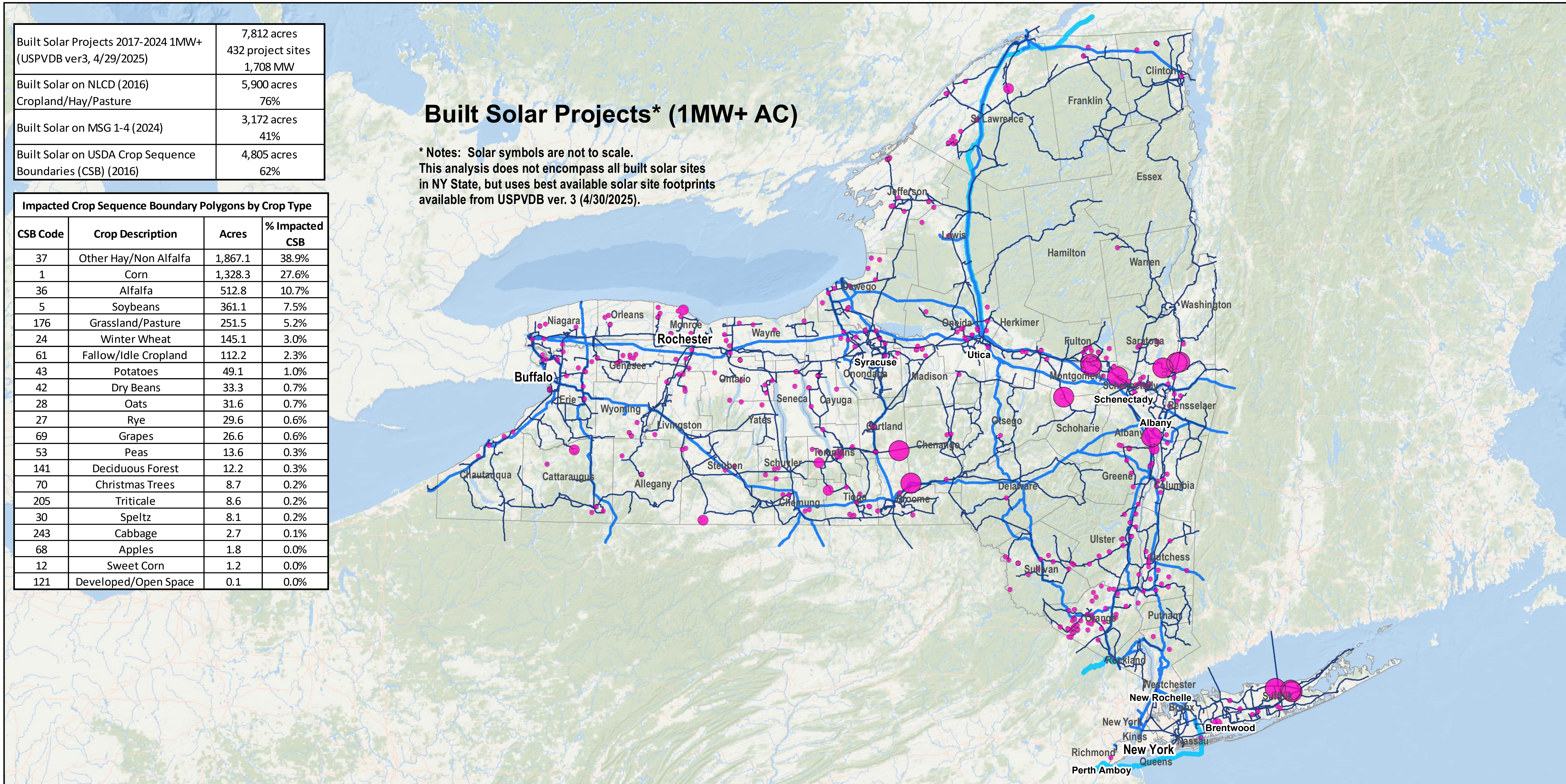
Built Solar Projects 2017-2024 1MW+ (USPVDB ver3, 4/29/2025)	7,812 acres 432 project sites 1,708 MW
Built Solar on NLCD (2016) Cropland/Hay/Pasture	5,900 acres 76%
Built Solar on MSG 1-4 (2024)	3,172 acres 41%
Built Solar on USDA Crop Sequence Boundaries (CSB) (2016)	4,805 acres 62%

Impacted Crop Sequence Boundary Polygons by Crop Type

CSB Code	Crop Description	Acres	% Impacted CSB
37	Other Hay/Non Alfalfa	1,867.1	38.9%
1	Corn	1,328.3	27.6%
36	Alfalfa	512.8	10.7%
5	Soybeans	361.1	7.5%
176	Grassland/Pasture	251.5	5.2%
24	Winter Wheat	145.1	3.0%
61	Fallow/Idle Cropland	112.2	2.3%
43	Potatoes	49.1	1.0%
42	Dry Beans	33.3	0.7%
28	Oats	31.6	0.7%
27	Rye	29.6	0.6%
69	Grapes	26.6	0.6%
53	Peas	13.6	0.3%
141	Deciduous Forest	12.2	0.3%
70	Christmas Trees	8.7	0.2%
205	Triticale	8.6	0.2%
30	Speltz	8.1	0.2%
243	Cabbage	2.7	0.1%
68	Apples	1.8	0.0%
12	Sweet Corn	1.2	0.0%
121	Developed/Open Space	0.1	0.0%

Built Solar Projects* (1MW+ AC)

*** Notes: Solar symbols are not to scale.**
This analysis does not encompass all built solar sites in NY State, but uses best available solar site footprints available from USPVDB ver. 3 (4/30/2025).



Built Solar Location 2017-2024* (USPVDB projects 1MW+)
- 1 - 5 MW
- >5 - <20 MW
- >=20 MW

Electric Power Transmission Lines
- 450 kV+
- 348/345/230 kV
- 138/115/69 kV (including unclassified voltages)

Sources: USPVDB ver3 2025; NLCD 2016; MSG 1-4 2024; HIFLD Electric Transmission Lines 2023; USDA Crop sequence Boundaries (CSB) 2016; NYS GIS clearinghouse 2024; ESRI base data.

*** Notes: Solar symbols are not to scale.**
This analysis does not encompass all built solar sites in NY State, but uses best available solar site footprints available from USPVDB ver. 3 (4/29/2025).

Coordinate System:
State Plane New York Central
NAD 1983

December 1, 2025

wsp

Map 2
Built Solar Projects* 2017-2024 and Converted Agricultural Lands 2016 (NLCD, CSB, & MSG1-4)

NEW YORK STATE ENERGY RESEARCH AND DEVELOPMENT AUTHORITY (NYSERDA)

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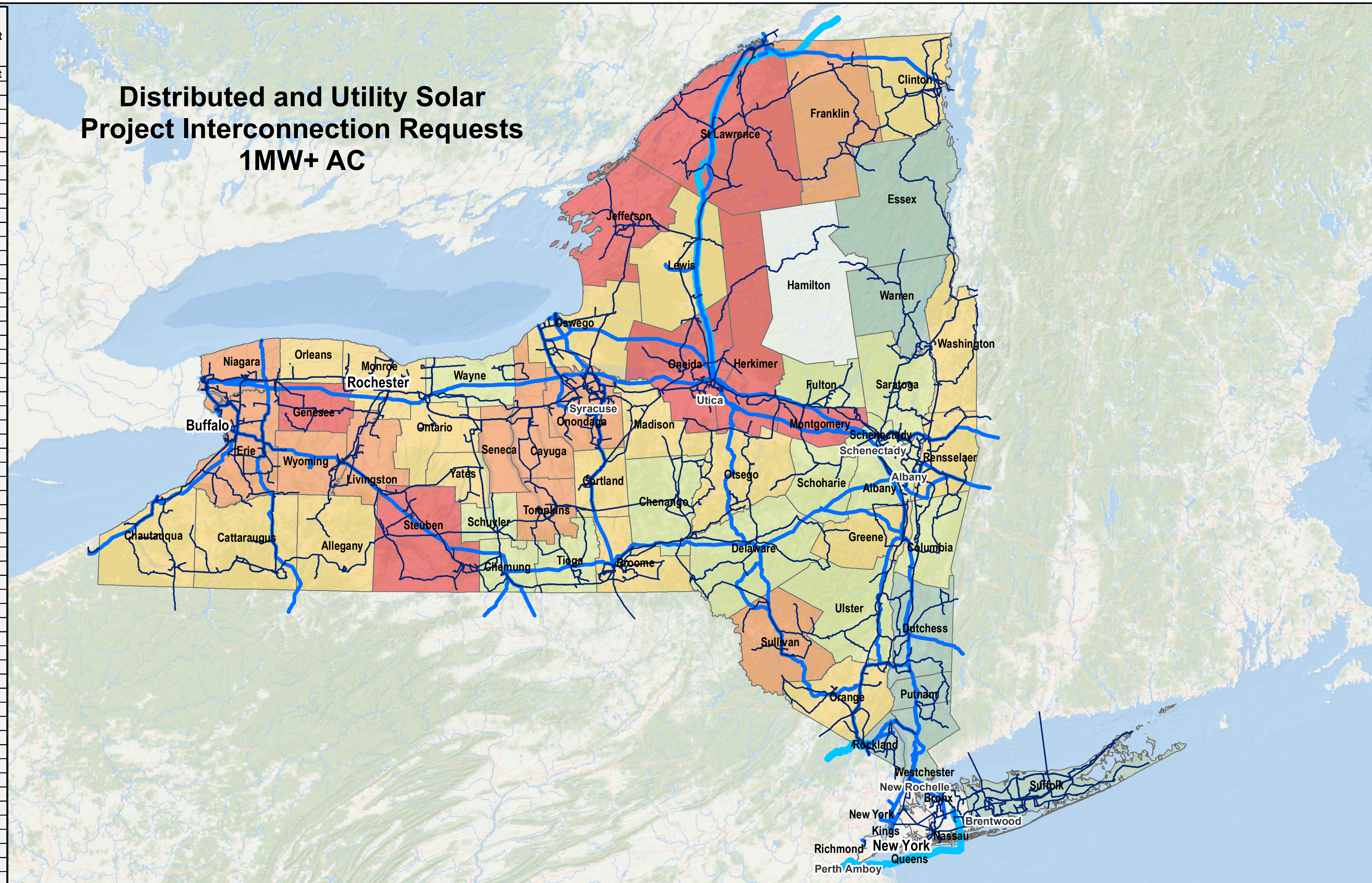
	SIR Queue Utility Interconnect Requests (Not Completed)		NYISO Queue Solar Interconnect Requests (Not Completed)		TOTAL SIR & NYISO Queue (Not Completed)	
County	Megawatts	Count	Megawatts	Count	Megawatts	Count
Albany	121	29	40	2	161	31
Allegany	125	30	214	3	339	33
Broome	262	60	0	0	262	60
Cattaraugus	235	53	40	2	275	55
Cayuga	75	17	688	7	763	24
Chautauqua	305	72	0	0	305	72
Chemung	131	29	0	0	131	29
Chenango	102	23	120	1	222	24
Clinton	144	35	265	3	409	38
Columbia	102	22	100	3	202	25
Cortland	79	18	340	2	419	20
Delaware	57	13	145	1	202	14
Dutchess	61	14	0	0	61	14
Erie	299	71	300	2	599	73
Essex	59	14	40	2	99	16
Franklin	85	20	657	5	742	25
Fulton	56	15	180	4	236	19
Genesee	170	37	1,130	5	1,300	42
Greene	83	19	170	5	253	24
Hamilton	0	0	0	0	0	0
Herkimer	91	21	1,600	11	1,691	32
Jefferson	190	43	1,444	11	1,634	54
Lewis	65	15	200	2	265	17
Livingston	133	29	505	7	638	36
Madison	124	28	340	2	464	30
Monroe	133	33	171	2	304	35
Montgomery	110	26	1,466	13	1,576	39
Niagara	175	40	755	4	930	44
Oneida	255	57	895	9	1,150	66
Onondaga	264	61	238	3	502	64
Ontario	120	28	170	2	290	30
Orange	266	66	40	2	306	68
Orleans	104	22	200	1	304	23
Oswego	224	51	45	2	269	53
Otsego	53	13	350	1	403	14
Putnam	2	1	0	0	2	1
Rensselaer	252	55	120	6	372	61
Rockland	1	1	0	0	1	1
Saratoga	204	47	0	0	204	47
Schenectady	73	16	40	2	113	18
Schoharie	27	7	110	4	137	11
Schuyler	87	19	70	2	157	21
Seneca	74	15	663	5	736	20
St Lawrence	328	73	1,077	12	1,405	85
Steuben	225	50	857	7	1,082	57
Suffolk	61	23	36	1	97	24
Sullivan	97	23	560	3	657	26
Tioga	87	19	120	2	207	21
Tompkins	122	27	595	6	716	33
Ulster	102	24	0	0	102	24
Warren	60	12	0	0	60	12
Washington	115	25	280	6	395	31
Wayne	146	33	0	0	146	33
Westchester	85	29	0	0	85	29
Wyoming	57	14	561	7	618	21
Yates	47	11	250	3	297	14
TOTAL	**7,111**	**1,648**	**18,185**	**185**	**25,295**	**1,833**

Distributed and Utility Solar Project Interconnection Requests 1MW+ AC



Combined SIR & NYISO Queues on Solar Power Interconnenction Requests 1MW+ 2000-2024 (Not Completed Projects)*

Megawatts (MW) per County

- 0 MW
- 1 - 100 MW
- 101 - 250 MW
- 251 - 500 MW
- 501 - 1,000 MW
- 1,001 - 1,692 MW

Electric Power Transmission Lines

- 450 kV+
- 348/345/230 kV
- 138/115/69 kV (including unclassified voltages)

* Notes:
- NYISO queue interconnection requests queried for solar projects (S and CR), 1 MW+ AC, including projects under construction. Data Source https://www.nyiso.com/interconnections. (Requests from 1/2000 -1/2024. Last updated 2/29/2024).
- SIR Inventory Information queue for interconnection requests of community scale projects across all six service areas, filtered to show projects >= 1 MW AC, and projects that are not completed. Data Source https://dps.ny.gov/distributed-generation-information. (Requests from 1/2000 -1/2024. Last updated 1/29/2024).
- Excluded projects in New York, Bronx, Kings, Queens, Nassau, and Richmond Counties due to high likelihood these solar projects are not sited on agricultural lands.

Sources: NYISO Queue 2024; SIR Utility Interconnection Queue 2024; NYS GIS clearinghouse 2024; ESRI base data.

Coordinate System:
State Plane New York Central
NAD 1983

April 16, 2025

wsp

Map 3
Combined NYISO & SIR Queues on Solar Power Interconnection Requests 2000-2024 of Not Completed Projects
Reported through 1/2024

NEW YORK STATE ENERGY RESEARCH AND DEVELOPMENT AUTHORITY (NYSERDA)

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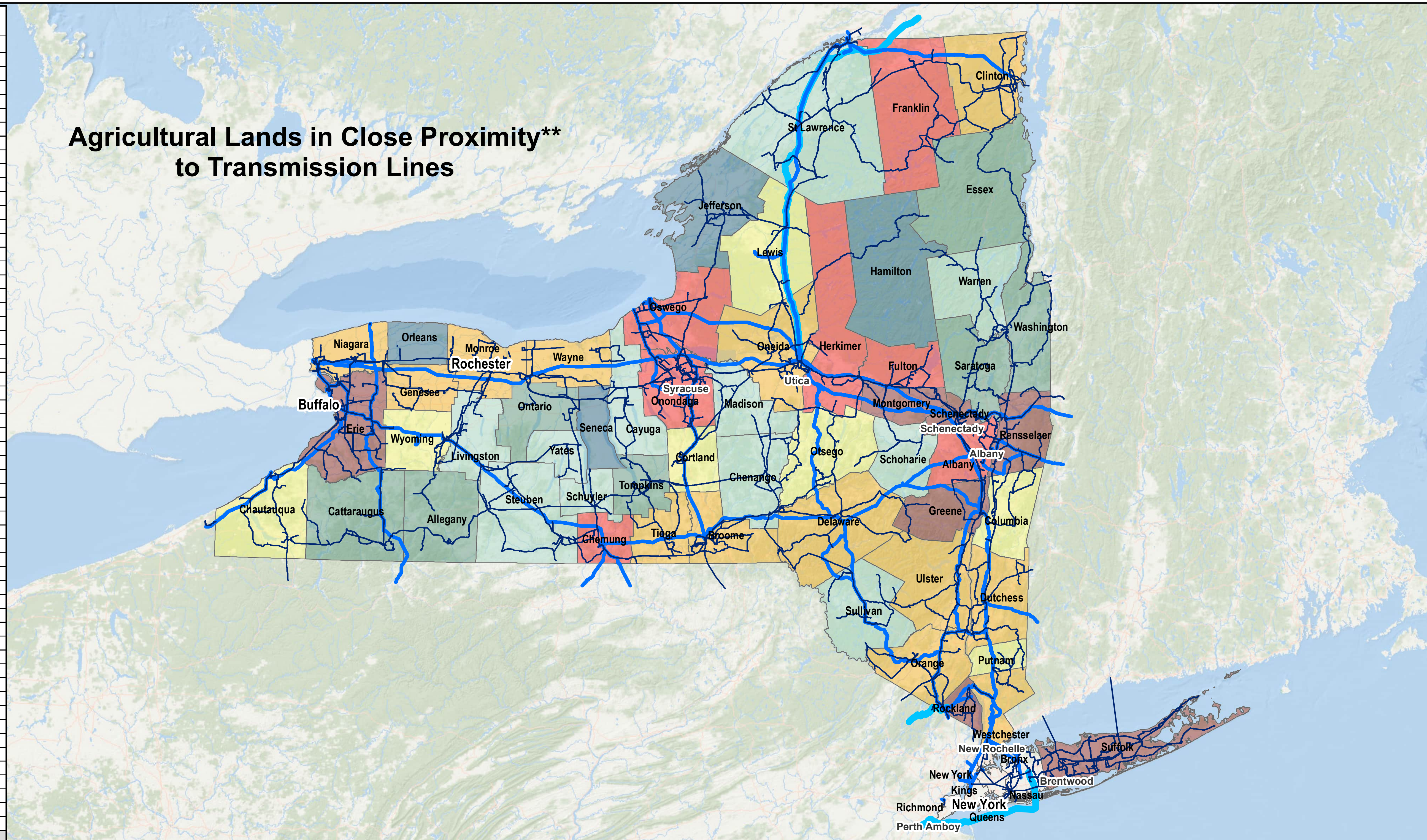
Ag Land (NLCD 2021) within 1-Mile of <=138 kV or 3-Miles of 230-348 kV Transmission Lines		
County*	Percent of Ag Land	Acres of Ag Land
Montgomery	83%	108,298
Rockland	82%	992
Greene	77%	24,622
Suffolk	76%	25,970
Rensselaer	75%	55,388
Erie	74%	124,012
Schenectady	71%	14,817
Chemung	69%	41,538
Herkimer	67%	89,484
Fulton	67%	23,066
Albany	66%	33,820
Onondaga	64%	104,328
Oswego	62%	62,478
Franklin	61%	53,575
Delaware	57%	69,980
Tioga	57%	53,391
Wayne	57%	95,767
Oneida	57%	109,347
Broome	55%	49,159
Ulster	54%	29,672
Westchester	54%	3,187
Niagara	54%	89,071
Dutchess	53%	44,849
Clinton	52%	50,262
Genesee	51%	86,648
Monroe	50%	71,065
Orange	50%	43,118
Lewis	50%	61,283
Otsego	50%	82,861
Columbia	48%	47,885
Putnam	47%	1,514
Cortland	45%	47,065
Wyoming	42%	74,269
Chautauqua	42%	80,504
St Lawrence	40%	102,635
Sullivan	40%	15,765
Livingston	40%	81,580
Yates	39%	38,970
Chenango	37%	51,523
Cayuga	37%	84,628
Steuben	36%	101,487
Madison	35%	53,000
Warren	32%	2,296
Schuyler	32%	21,324
Schoharie	32%	28,915
Washington	30%	44,650
Tompkins	29%	31,554
Cattaraugus	28%	43,693
Essex	26%	9,875
Saratoga	26%	16,989
Ontario	26%	51,303
Allegany	21%	29,706
Orleans	17%	24,677
Jefferson	16%	49,715
Hamilton	15%	127
Seneca	9%	10,873
NY State	**44%**	**2,848,573**

Agricultural Lands in Close Proximity** to Transmission Lines



Percent of Agricultural Land in Close Proximity** to Transmission Lines (<=348kV)
(NLCD 2021- Cultivated Crops and Hay/Pasture Classes)

- 8% - 20%
- 21% - 30%
- 31% - 40%
- 41% - 50%
- 51% - 60%
- 61% - 70%
- 71% - 85%

Electric Power Transmission Lines (HIFLD 2022)

- 450 kV+
- 348/345/230 kV
- 138/115/69 kV (including unclassified voltages)

*Bronx, Kings, Nassau, New York, Queens, and Richmond Counties were omitted from this comparison due to urban character.
** For this analysis, close proximity is considered within 1-Mile of <=138 kV or within 3-Miles of 230-348 kV Transmission Lines.

Sources: NLCD 2021; HIFLD 2022; NYS GIS clearinghouse 2024; ESRI base data.

Coordinate System:
State Plane New York Central
NAD 1983

April 16, 2025

wsp

Map 4
Agricultural Lands within Close Proximity to Electric Transmission Lines348 kV and less

NEW YORK STATE ENERGY RESEARCH AND DEVELOPMENT AUTHORITY (NYSERDA)

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0 25 50 75 100 Miles

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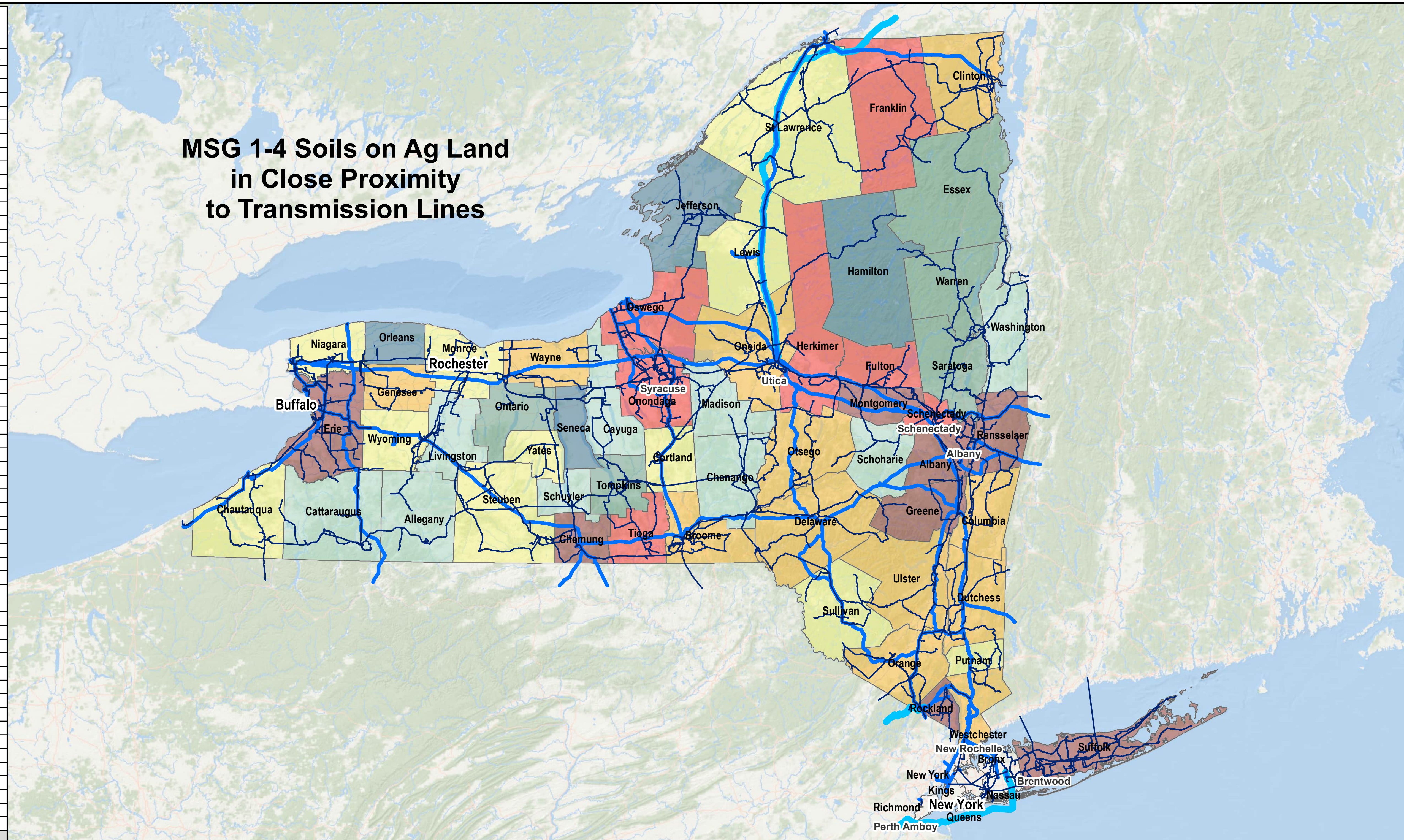
MSG 1-4 Soils on Ag Land (NLCD2021) within 1-Mile of <=138 kV or 3-Miles of 230-348 kV Transmission Lines		
County*	**Percent of MSG 1-4**	**Acres of MSG 1-4**
Montgomery	84%	22,327
Rockland	79%	301
Chemung	79%	15,317
Suffolk	76%	21,704
Rensselaer	76%	16,850
Erie	76%	56,640
Albany	72%	10,924
Greene	71%	5,496
Schenectady	70%	2,299
Herkimer	69%	33,639
Onondaga	65%	64,101
Franklin	64%	6,195
Fulton	63%	7,340
Tioga	63%	16,021
Oswego	60%	21,776
Columbia	58%	22,898
Delaware	57%	18,046
Ulster	57%	10,934
Wayne	56%	57,503
Genesee	56%	51,206
Clinton	55%	17,934
Orange	54%	16,913
Otsego	54%	28,345
Dutchess	53%	17,954
Oneida	52%	50,770
Westchester	52%	1,160
Broome	50%	6,804
Lewis	50%	21,947
Monroe	49%	51,484
Niagara	48%	29,363
Chautauqua	48%	32,270
Putnam	47%	571
Cortland	47%	12,350
Steuben	45%	33,969
Wyoming	44%	37,131
St Lawrence	44%	32,002
Yates	42%	24,539
Sullivan	40%	5,407
Chenango	40%	21,459
Madison	39%	26,347
Allegany	38%	10,980
Cayuga	36%	53,019
Livingston	35%	36,718
Cattaraugus	34%	18,203
Washington	33%	13,634
Schuyler	33%	7,952
Schoharie	32%	8,522
Tompkins	29%	11,544
Ontario	29%	33,013
Saratoga	25%	6,603
Warren	23%	346
Essex	22%	3,088
Jefferson	18%	18,353
Orleans	14%	11,912
Seneca	7%	4,731
Hamilton	0%	0
NY State	**45%**	1,168,855



Percent of MSG 1-4 Soils on Ag Land (NLCD2021) in Close Proximity** to Transmission Lines (<=348kV)

- 0% - 20%
- 21% - 30%
- 31% - 40%
- 41% - 50%
- 51% - 60%
- 61% - 70%
- 71% - 85%

Electric Power Transmission Lines (HIFLD 2022)

- 450 kV+
- 348/345/230 kV
- 138/115/69 kV (including unclassified voltages)

*Bronx, Kings, Nassau, New York, Queens, and Richmond Counties were omitted from this comparison due to urban character.
** For this analysis, close proximity is considered within 1-Mile of <=138 kV or within 3-Miles of 230-348 kV Transmission Lines.

Sources: MSG 1-4 NYSERDA 2022; HIFLD 2022; NYS GIS clearinghouse 2024; ESRI base data.

Coordinate System:
State Plane New York Central
NAD 1983

April 16, 2025

wsp

Map 5
MSG 1-4 Soils on Ag Land
within Close Proximity to
Electric Transmission Lines348 kV and less

NEW YORK STATE ENERGY RESEARCH
AND DEVELOPMENT AUTHORITY (NYSERDA)

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0 25 50 75 100 Miles

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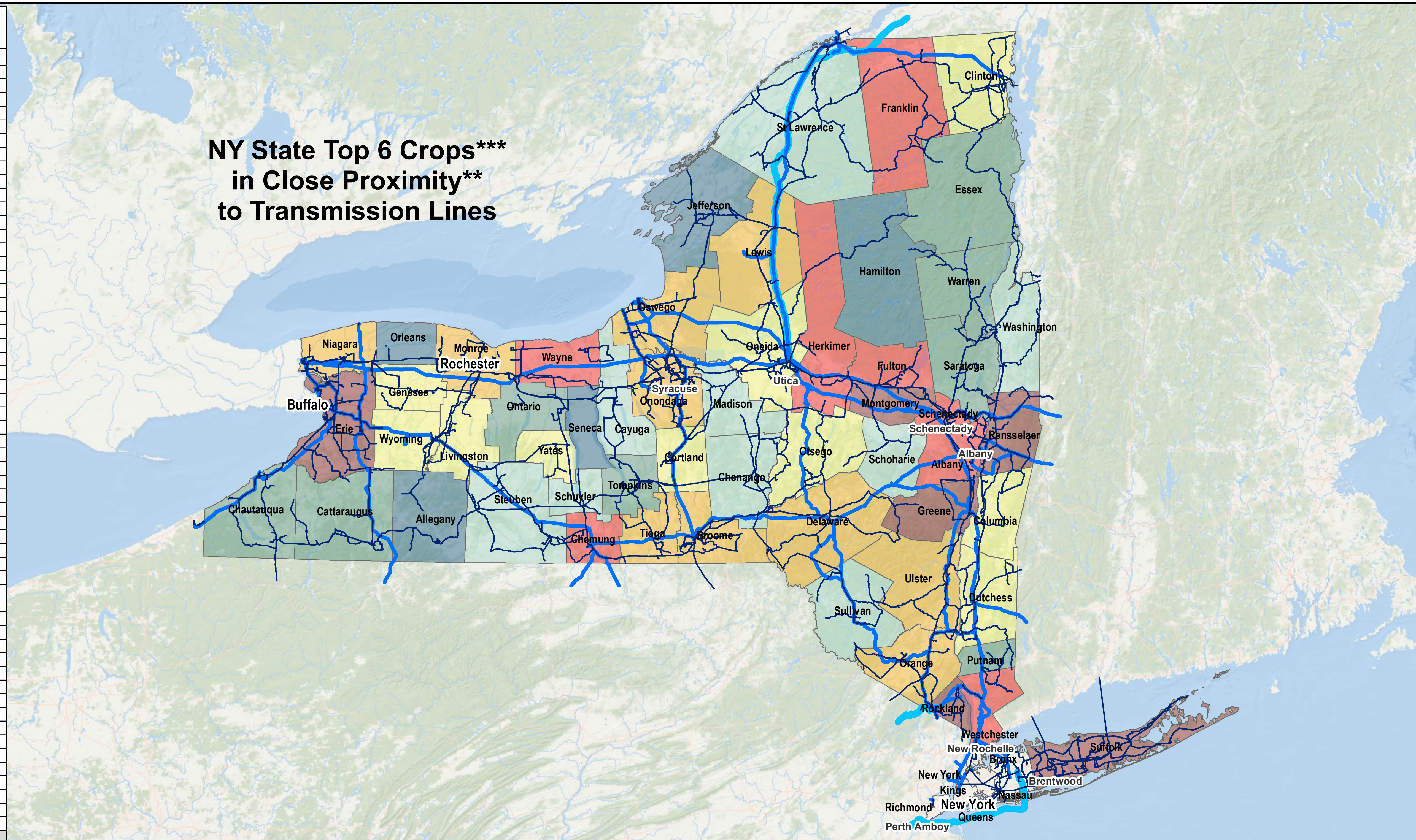
USDA Crop Sequence Boundaries 2023 (Top 6 Crops**) within 1-Mile of <=138 kV or 3-Miles of 230-348 kV Transmission Lines		
County*	Percent of CSB	Acres of CSB
Montgomery	85%	89,780
Suffolk	82%	5,948
Greene	81%	13,685
Rockland	76%	37
Rensselaer	73%	31,192
Erie	70%	66,987
Fulton	70%	15,651
Schenectady	69%	9,267
Westchester	68%	238
Chemung	68%	15,229
Herkimer	68%	60,652
Wayne	63%	61,001
Albany	62%	21,349
Franklin	62%	45,907
Onondaga	58%	57,897
Delaware	58%	35,206
Broome	58%	17,912
Tioga	57%	26,338
Oswego	55%	25,068
Ulster	54%	11,576
Niagara	54%	59,858
Orange	52%	23,914
Monroe	51%	38,418
Lewis	50%	49,048
Columbia	49%	25,596
Clinton	49%	33,180
Genesee	49%	60,201
Oneida	49%	55,946
Dutchess	48%	15,114
Otsego	48%	43,611
Cortland	45%	27,654
Wyoming	43%	63,140
Livingston	41%	64,721
Yates	41%	28,123
St Lawrence	39%	58,981
Cayuga	38%	67,606
Steuben	37%	65,270
Sullivan	37%	8,113
Chenango	36%	25,159
Madison	35%	32,710
Schoharie	31%	19,907
Washington	31%	27,808
Schuyler	30%	10,809
Chautauqua	28%	32,067
Ontario	27%	36,763
Putnam	27%	75
Tompkins	26%	15,083
Cattaraugus	26%	25,587
Essex	24%	4,029
Saratoga	21%	8,117
Warren	21%	178
Allegany	20%	17,219
Orleans	19%	18,234
Jefferson	16%	33,386
Seneca	9%	8,399
Hamilton	0%	0
NY State	**43%**	1,714,944



Percent of Top 6 Crops*** in Close Proximity** to Transmission Lines (<=348kV)

- 0% - 20%
- 21% - 30%
- 31% - 40%
- 41% - 50%
- 51% - 60%
- 61% - 70%
- 71% - 85%

Electric Power Transmission Lines (HIFLD 2022)

- 450 kV+
- 348/345/230 kV
- 138/115/69 kV (including unclassified voltages)

Sources: USDA Crop Sequence Boundaries 2023; HIFLD 2022; NYS GIS clearinghouse 2024; ESRI base data.

***NY State Top 6 Most Abundant CSB 2023 within 1-Mile of <=138 kV or 3-Miles of 230-348 kV Transmission Lines*				
Crop Code	Acres	Percent	Rank	Crop Description
1	553,696	43%	1	Corn
37	342,930	42%	2	Other Hay/Non Alfalfa
176	303,996	43%	3	Grassland/Pasture
36	269,502	43%	4	Alfalfa
5	190,152	44%	5	Soybeans
24	54,668	40%	6	Winter Wheat

*Bronx, Kings, Nassau, New York, Queens, and Richmond Counties were omitted from this comparison due to urban character.
** For this analysis, close proximity is considered within 1-Mile of <=138 kV or within 3-Miles of 230-348 kV Transmission Lines.

Coordinate System:
State Plane New York Central
NAD 1983

April 16, 2025

Map 6
USDA Crop Sequence Boundaries within Close Proximity to Electric Transmission Lines348 kV and less

NEW YORK STATE ENERGY RESEARCH AND DEVELOPMENT AUTHORITY (NYSERDA)

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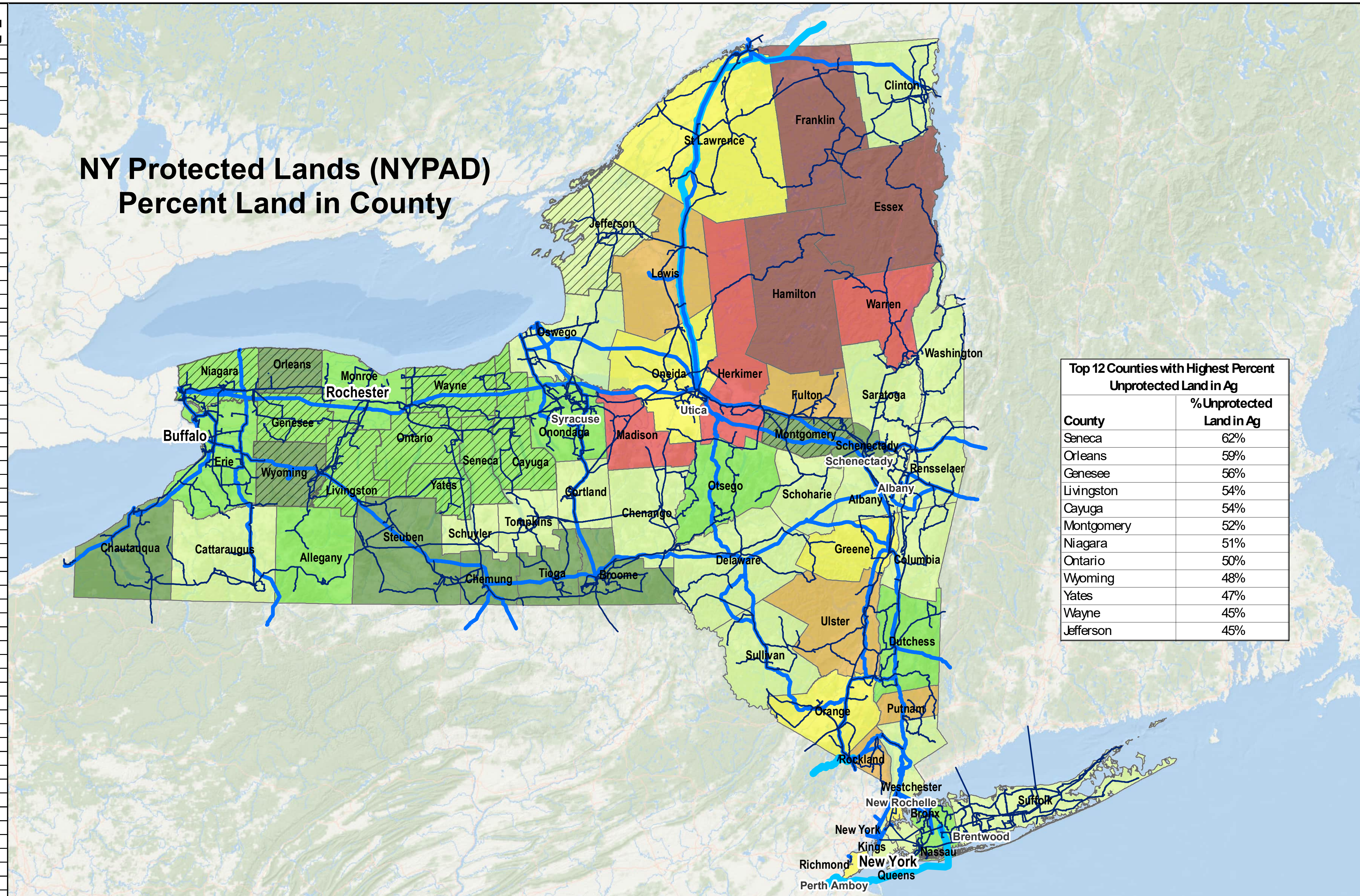
County	Total Land Acres	Protected Acres	% Protected / Total Land	Unprotected Acres	Estimated Ag Land Acres	% Unprotected Land that is Ag
Albany	335,701	33,036	10%	302,665	51,448	16%
Allegany	659,184	55,606	8%	603,578	140,635	23%
Bronx	26,705	4,800	18%	21,906	30	0%
Broome	452,245	14,000	3%	438,245	88,647	20%
Cattaraugus	837,646	106,005	13%	731,641	156,698	21%
Cayuga	442,706	27,963	6%	414,743	231,407	54%
Chautauqua	678,759	28,248	4%	650,510	192,956	30%
Chemung	261,415	6,916	3%	254,499	59,987	23%
Chenango	571,445	82,050	14%	489,395	139,606	28%
Clinton	664,795	116,118	17%	548,677	96,739	17%
Columbia	406,808	56,939	14%	349,870	99,094	24%
Cortland	319,162	36,336	11%	282,825	104,729	36%
Delaware	926,799	113,085	12%	813,715	122,667	15%
Dutchess	512,762	64,690	13%	448,072	84,092	17%
Erie	665,937	22,711	3%	643,226	168,364	26%
Essex	1,150,257	714,951	62%	435,306	37,328	8%
Franklin	1,044,898	525,754	50%	519,143	87,543	17%
Fulton	317,958	97,093	31%	220,865	34,560	15%
Genesee	315,498	14,381	5%	301,118	170,990	56%
Greene	414,559	99,958	24%	314,601	31,876	10%
Hamilton	1,101,193	917,618	83%	183,574	851	0%
Herkimer	904,451	408,568	45%	495,883	132,872	27%
Jefferson	812,884	149,315	18%	663,569	306,671	45%
Kings	44,067	5,191	12%	38,876	36	0%
Lewis	815,858	256,879	31%	558,979	122,873	22%
Livingston	403,186	26,176	6%	377,010	206,398	54%
Madison	418,655	37,920	9%	380,735	150,966	39%
Monroe	421,023	20,941	5%	400,082	140,686	34%
Montgomery	259,042	9,033	3%	250,009	129,903	52%
Nassau	183,397	10,883	6%	172,514	665	0%
New York	14,420	2,150	15%	12,271	8	0%
Niagara	333,077	9,788	3%	323,289	165,926	51%
Oneida	776,111	67,618	9%	708,493	193,321	27%
Onondaga	497,977	33,074	7%	464,903	163,644	34%
Ontario	411,732	17,968	4%	393,764	199,504	50%
Orange	522,540	106,531	20%	416,010	85,590	19%
Orleans	249,394	6,620	3%	242,774	143,492	59%
Oswego	610,157	57,514	9%	552,643	101,463	18%
Otsego	640,531	37,509	6%	603,022	166,434	27%
Putnam	148,406	38,923	26%	109,482	3,239	3%
Queens	69,214	8,000	12%	61,214	108	0%
Rensselaer	418,265	45,541	11%	372,724	73,952	19%
Richmond	36,447	7,082	19%	29,364	127	0%
Rockland	111,498	36,258	33%	75,240	1,207	1%
Saratoga	520,279	79,599	15%	440,680	64,793	14%
Schenectady	132,105	4,462	3%	127,644	21,016	16%
Schoharie	397,681	41,758	11%	355,923	89,750	25%
Schuyler	210,037	37,834	18%	172,202	65,929	36%
Seneca	208,444	20,292	10%	188,152	124,032	62%
St Lawrence	1,715,406	489,629	29%	1,225,777	257,208	21%
Steuben	889,430	32,788	4%	856,642	279,085	32%
Suffolk	580,318	77,276	13%	503,041	34,348	6%
Sullivan	622,062	70,166	11%	551,896	39,547	7%
Tioga	331,665	12,802	4%	318,864	93,586	29%
Tompkins	304,756	39,171	13%	265,585	107,050	39%
Ulster	721,962	221,209	31%	500,753	54,612	10%
Warren	556,168	228,322	41%	327,846	7,092	2%
Washington	532,925	59,142	11%	473,784	150,010	30%
Wayne	385,221	23,582	6%	361,638	168,279	45%
Westchester	277,655	31,500	11%	246,156	5,887	2%
Wyoming	379,048	9,377	2%	369,671	176,860	48%
Yates	216,161	11,296	5%	204,866	98,794	47%



Top 12 Counties with Highest Percent Unprotected Land in Ag	
County	% Unprotected Land in Ag
Seneca	62%
Orleans	59%
Genesee	56%
Livingston	54%
Cayuga	54%
Montgomery	52%
Niagara	51%
Ontario	50%
Wyoming	48%
Yates	47%
Wayne	45%
Jefferson	45%

Top 12 Counties with Highest Percent Unprotected Land in Ag

Percent Protected Land per County, in NY Protected Areas Database (NY PAD 2024)*

- 0% - 5%
- 6% - 10%
- 11% - 20%
- 21% - 30%
- 31% - 40%
- 41% - 50%
- 51% - 100%

Electric Power Transmission Lines (HIFLD 2022)

- 450 kV+
- 348/345/230 kV
- 138/115/69 kV (including unclassified voltages)

* Open Water NLCD class was removed from acreage of each county to better represent land acres.

Sources: NYPAD 2024; NLCD 2021; HIFLD 2022; NYS GIS clearinghouse 2024; ESRI base data.

Coordinate System:
State Plane New York Central
NAD 1983

September 16, 2025

wsp

Map 7
NY Protected Areas Database (NY PAD)
Percent of Land by County

NEW YORK STATE ENERGY RESEARCH AND DEVELOPMENT AUTHORITY (NYSERDA)

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Appendix D. Top 12 Counties for National Land Cover Database Agricultural Land within Transmission Line Corridors

Table D-1. Top 12 Counties for National Land Cover Database Agricultural Land within Transmission Line Corridors

Source: See Appendix C, Map 4 and Map 5.

County	Estimated Solar Queue (acres)	NLCD Ag Land within Transmission Line Corridors[b] (acres)	County NLCD Ag Land within Transmission Line Corridors (%)	MSG1–4 Ag Land within Transmission Line Corridors (acres)	County MSG1–4 Ag Land (%)
Erie	2,997	124,012	74	56,640	76
Oneida[a]	5,749	109,347	57	50,770	52
Montgomery[a]	7,879	108,298	83	22,327	84
Onondaga	2,508	104,328	64	64,101	65
St. Lawrence[a]	7,026	102,635	40	32,002	44
Steuben[a]	5,411	101,487	36	33,969	45
Wayne	730	95,767	57	57,503	56
Herkimer[a]	8,456	89,484	67	33,639	69
Niagara[a]	4,649	89,071	54	29,363	48
Genesee[a]	6,499	86,648	51	51,206	56
Cayuga[a]	3,813	84,628	37	53,019	36
Otsego	2,017	82,861	50	28,345	54

[a.] Among the top 12 counties for proposed solar interconnections.

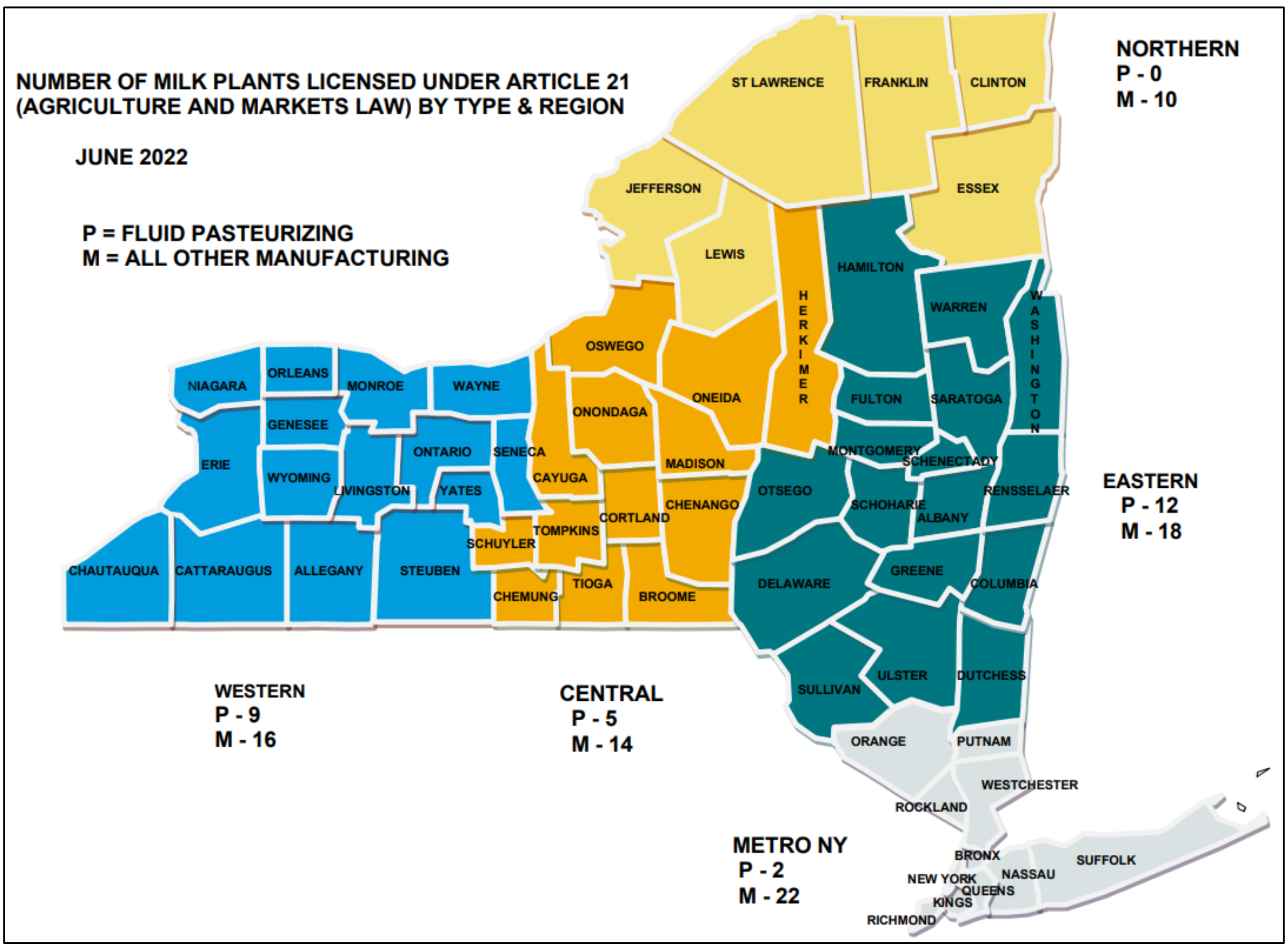
[b.] Transmission line corridor = within 1 mile of 138kV or 3 miles of 230kV–348kV transmission lines.

Appendix E. Milk Plant Statistics

The 2022 Dairy Statistics Report includes a list of dairy plants in NYS by county and type obtained from monthly reports filed by milk handlers and processors operating under an Article 21 license under the New York State Agriculture and Markets Law (AGM 2022b). Figure E-1 provides a high-level understanding of the plants by type and region, totaling 28 fluid pasteurizing plants and 80 other manufacturing plants.

Figure E-1. Milk Plants by Type and Region

Source: AGM (2022b).



Appendix F. Global Data Table

Table F-1. Global Data Table

Description	Report Section	Map Number	Figure	Unit	Notes
Agricultural land / land in farms in NYS	N/A	Map 1	~6.5 million	Acres	NLCD: 6,426,853 acres (2021). Ag Census: 6,502,286 acres (2022).
Historical NLCD development on NYS ag land	2.1	Map 1	~76,000 (3,600/year)	Acres	WSP analysis, 2001–2021. Ag land converted to NLCD developed (open space and low, medium, and high intensity).
		N/A	~253,500 (16,900/year)	Acres	American Farmland Trust analysis, 2001–2016. 56,300 acres converted to urban and highly developed (UHD); 197,200 acres converted to low-density residential (LDR).
Built solar in NYS	2.1	N/A	20,066	Acres	2011–2025. 2,992 acres of utility-scale,[30] 17,074 acres of community-scale (see methodology in Appendix B).
Average distance of utility-scale solar sites from transmission lines	2.1	N/A	0.97	Mile	Based on 15 utility project footprints.
% Built solar on NYS Ag land	2.2	Map 2	62–76	%	WSP analysis. 62% derived from built solar on USDA Crop Sequence Boundaries (2016). 76% derived from built solar on NLCD cropland/hay/pasture (2016).
		N/A	>50	%	Koch and Woodbury (2024) analysis.
% Built solar on MSG 1–4[31]	2.2	Map 2	41	%	WSP analysis.
		N/A	44	%	Koch and Woodbury (2024) analysis.
% Built solar on MSG 1–4 on agricultural land	2.2	N/A	32	%	WSP analysis
Proposed solar projects in the NYISO and SIR queues	2.3	Map 3	25,295	MW	As of April 2024. 7,111 MW are community-scale interconnection requests, and 18,185 MW are utility-scale interconnection requests.

Endnotes

[1] Based on U.S. Department of Agriculture Crop Sequence Boundary data.

[2] A total of 5,536 acres of built ground solar were recorded in the USPVDB v3 database between 2001 and 2021, and only 19% (1,057 acres) of that correlated with NLCD “Developed” categories (2021), suggesting that NLCD data may have limitations in the ability to capture all solar development.

[3] For context, 2016 NLCD data show 6,426,908 acres of agricultural land statewide and 2,582,036 acres of agricultural land on highly productive MSG 1–4 soils (see Appendix C, Map 1).

[4] Represents 0.31% of the approximately 6.5 million acres of farmland in New York State, according to the 2022 USDA Census of Agriculture.

[5] See Figure 5 for additional information on the size and location of constructed projects.

[6] Data source: New York State Energy Research and Development Authority (NYSERDA) Statewide Distributed Solar (2000–2025) for projects ≥1 MW. Data provided is in tabular form; shapefiles are not available.

[7] Data provided is in tabular form; shapefiles are not available.

[8] See Section 2.3.1 for discussion of the 5 -acre-per-MW estimate.

[9] Data source: U.S. Large-Scale Solar Photovoltaic Database (USPVDB) v3.0 (April 2025). The dataset covers ground- and roof-mounted projects of ≥1 MW of direct current electric energy capacity completed through 2024. Acreage estimates do not capture the full project footprint, including nonsolar areas within or outside fenced boundaries or access roads. The dataset relies on aerial imagery and may not capture all existing projects.

[10] NLCD is a 30-meter resolution grid-based dataset derived from satellite imagery and intended for broad-scale analysis. Crop Sequence Boundaries (CSB) is a vector-based dataset composed of field-level polygons derived from satellite imagery and additional data sources, including ground verification. CSB provides detailed agricultural field boundaries, acreages, and crop rotation histories.

[11] Koch and Woodbury (2024) found that fenced solar project areas average 4.1–4.3 acres per MW for fixed-tilt and single-axis tracking sites, respectively, while larger projects exceed more than 5 acres per MW. A study published in the Institute of Electrical and Electronics Engineers (IEEE) *Journal of Photovoltaics* estimates 2.9 acres per MW for fixed-tilt systems and 4.4 acres per MW for single-axis tracking systems (Lawrence Berkeley National Laboratory 2022).

[12] For context, the Climate Leadership and Community Protection Act (Climate Act) establishes a target of 6,000 MW of distributed solar by 2025. A New York State Public Service Commission (PSC) Order sets a goal of 10,000 MW of distributed solar by 2030.

[13] These trends reflect development patterns prior to policies discouraging agricultural siting (e.g., agricultural mitigation payments and the solar siting scorecard).

[14] Based on 6,502,286 acres of farmland in New York State (USDA NASS 2024a).

[15] Excluding Bronx, Kings, New York, Queens, and Richmond counties. Transmission corridor proximity defined as within 1 mile of ≤138 kV or within 3 miles of lines 230–348 kV.

[16] Includes large agricultural counties defined as those with more than 4,000 Farm Service Agency acres. Rockland County (82%) also has a high share of agricultural land within transmission line corridors, but is excluded due to its small agricultural base.

[17] Approximately 20% higher than the statewide average of 50% incidence of these soils.

[18] See Appendix E for more information about dairy plants in New York State.

[19] New York Protected Areas Database (NYPAD) metadata defines protected lands as "those lands which are protected, designated, or functioning as conservation lands, open space, natural areas, or recreational areas through fee ownership, easement, management agreement, current land use, or other mechanism."

[20] The SRP (Community Distributed Generation Program) was established by the PSC in Case 15-E-0082.

[21] Hanson (2019) indicates a range of $1,500 to $2,000 per acre, while the New York State Tug Hill Commission (2023) indicates a range of $700 to $1,200 per acre.

[22] Loomis (2019, 2021) and Loomis et al. (2022) estimate total profitability by subtracting depreciation expenses and the opportunity cost of farmer labor from net cash income per farm.

[23] See AFT (2022).

[24] Property tax exemption applies only to the added value of the solar electric system. Landowners remain responsible for property taxes on land and structures (NYSERDA 2023b).

[25] Established under Article VIII of the New York State Public Service Law.

[26] Article VIII, Exhibit 18: Socioeconomic Effects.

[27] Indirect impacts include jobs and economic activity "associated with linked sectors in the economy that are upstream of the direct impacts." Induced impacts include jobs and economic impacts "generated from spending by workers who[se] jobs result from direct or indirect impacts of the Project" (East Point Energy Center, LLC, 2019).

[28] Article VIII, Exhibit 15: Agricultural Resources.

[29] New York State law permits agricultural assessments that reduce property tax bills for eligible land (Department of Taxation and Finance, n.d.a).

[30] USPVDB classifies clustered community-scale projects (e.g., adjacent 5-MWac projects) as utility-scale; reported acreage therefore includes a mix of NY-Sun and large-scale renewable (LSR) constructed projects rather than exclusively utility-scale.

[31] MSG 1–4 data include all land use types and is not limited to agricultural land.

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