# SMART PLANNING FOR SOLAR DEVELOPMENT USING GIS IN CAZENOVIA, NY

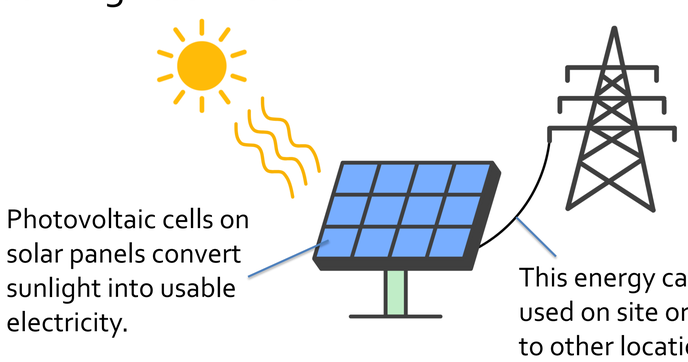
## INTRODUCTION

In 2019, New York pledged that 70% of its electricity demands would come from renewable sources by 2030. In order to meet this target, there is an urgent need to identify suitable locations for renewable energy projects in the state.


The rural, agricultural character of Upstate New York makes this area an attractive location for solar developers. Communities like the Town and Village of Cazenovia are proactively planning for solar development in their area.

## SOLAR SYSTEMS

As a leading source of renewable energy, solar arrays generate electricity from the sun without burning fossil fuels.




Solar energy systems come in different sizes. For this project, we focused on siting for commercial solar energy generation projects intended for off-site use of power. In New York, municipalities control the permitting process for projects under 25MW, and so the focus for this work was commercial projects in this category.

## CPF & SOLAR

The Cazenovia Preservation Foundation (CPF) is a land trust founded in 1967. CPF protects over 3,100 acres of land including historical façade easements, open space, and agricultural areas through direct ownership of properties and conservation easements.

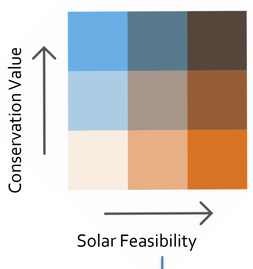
CPF has a long history of involvement in local land use and comprehensive planning topics, such as solar development, to ensure that Cazenovia's **historic, natural, and agricultural resources** are protected.

## METHODS

Through the Upstate Institute, I am working with the Cazenovia Preservation Foundation to create a decision-support tool that the Town will use to evaluate commercial solar energy proposals. This project was adapted from Scenic Hudson's How to Solar Now GIS-based toolkit.

HOW TO SOLAR NOW

A SOLAR ENERGY **TOOLKIT** FOR YOUR COMMUNITY




The criteria used for this assessment (shown in the section below) were ranked using a suitability scale from 1-5 (1 = not at all suitable, 5 = most suitable) with input from the Town Board's Working Group on Solar. We also considered whether each category should receive an additional weight multiplier (e.g., 2 = twice as important as another category). The final analyses will be merged into a bivariate choropleth map using ArcGIS Pro.

## GIS METHODOLOGY

**Determine and Rank Criteria for Suitability Analyses**

**Historic, Natural, and Agricultural Resources**

- NYS National Register of Historic Places
- Wetlands (NYS & NWI)
- Land Cover (NLCD)
- Local Historic, Architectural, Cultural Resources
- Critical Environmental Areas (DEC)
- Flood Zones (FEMA)
- Soils: Farmland Class (SSURGO)
- Protected Lands (PAD-US)
- NY Natural Heritage: Significant Natural Communities
- Agricultural Districts
- Nature Conservancy's Resilient and Connected Network
- Viewsheds and Scenic Resources

**Solar Feasibility and Developed Areas**

- Slope (DEM)
- Large Parking Lots
- Aspect (DEM)
- Mines (Reclaimed)
- Zoning Districts and Overlays
- Transmission Lines (National Grid)
- Large Building Rooftops (>20,000sqft, >10,000sqft)
- Three-Phase Distribution Lines (National Grid)

Product: Suitability Analysis Layer

Product: Suitability Analysis Layer

**Product: Bivariate Choropleth Map**

Supporting Maps: Solar Feasibility, Water Resources, Agricultural Resources, Natural Resources, Historic and Scenic Resources

## FUTURE RECOMMENDATIONS

This map tool is intended for the Town of Cazenovia to use when evaluating potential commercial solar projects. This work coincides with the Town's efforts to update its municipal code to better address solar project siting.

Local municipalities need to proactively plan for renewable energy development in their area while also preserving the unique resources that contribute to their community character. This project can serve as a model for other communities in the region.

Cassie Ferrante, '21
Upstate Institute Summer Field School 2021
COLGATE UNIVERSITY
CAZENOVIA PRESERVATION FOUNDATION

*Acknowledgments: I would like to thank my Upstate adviser, Jennifer Wong, for her instrumental advice and support throughout this project. I would also like to thank the Town of Cazenovia's Solar Committee for their feedback as well as Professor Loranty and Professor Cardelús for their guidance.*