

Georgia's Renewable Energy Technical Assistance Program and Model Solar Ordinance

On-farm energy solutions for Georgia



ReTAP – Renewable Energy Technical Assistance Program

- Funding from USDA Rural Development
- Technical Assistance for Renewable Energy Projects
- Community and Individualized Education
- Focus on solar but includes all renewable energy projects



**Agriculture Technical
Assistance Program**

at the University of Georgia

Solar and Agriculture – Smart Development

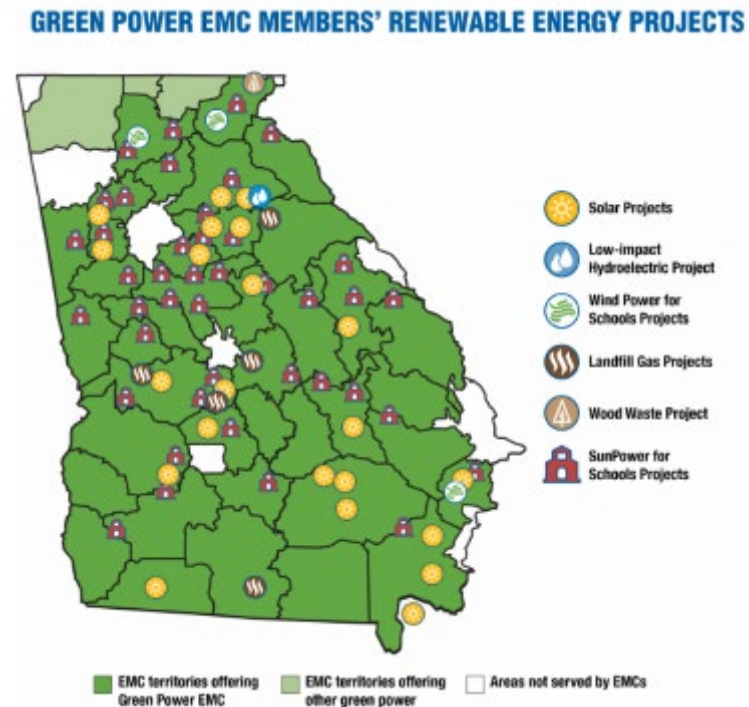


- Solar and Agriculture can coexist
- Marginal lands are best for solar
- Wildlife and other natural resources need to be considered
- <2% of farmland would need to be converted to supply 100% of US electricity demand¹

¹Southern Environmental Law Center, *Solar Power & Local Communities*,
https://www.southernenvironment.org/uploads/words_docs/SolarLocalComm_Handout_0217_F.pdf.

Solar Project Economics

- Historically low panel prices
 - ~\$1.03/watt industrial scale
 - ~\$1.85/watt for commercial
 - ~\$2.98/watt residential
- Conventional financing viable for solar projects
- Tax credits, grant programs and loan programs
- Georgia Power and EMCs expanding programs

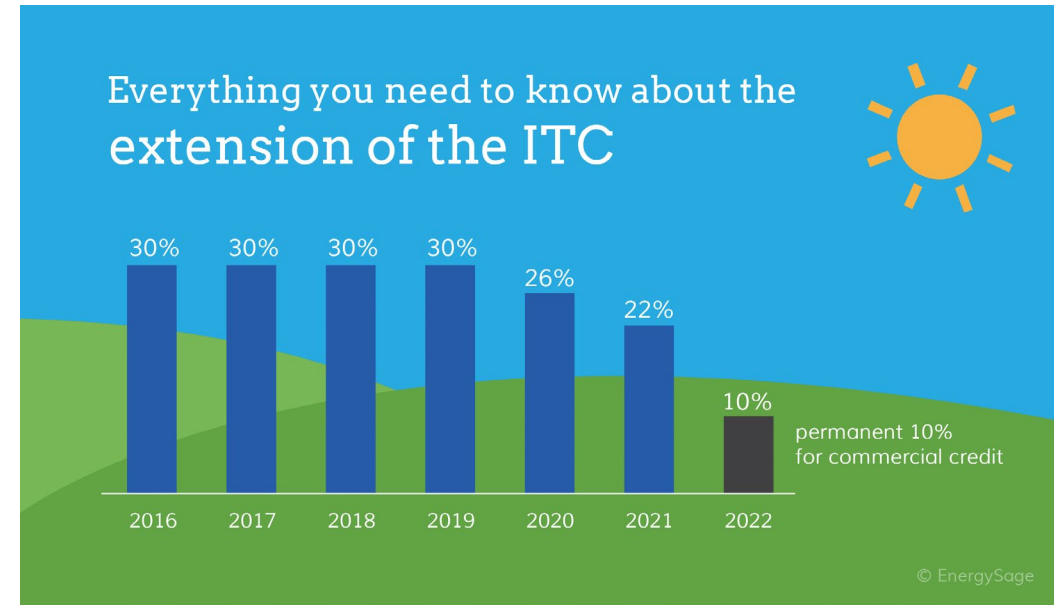


USDA REAP Grants and Loans

- Loan guarantees on loans up to 75% of total eligible project costs
- Grants for up to 25% of total eligible project costs (\$500,000 max)
- Combined grant and loan guarantee funding up to 75% of total eligible project costs
- Applies to renewable energy, energy conservation for producers in RURAL areas
- Grant awards are TAXABLE income (Reduces the amount you can write off for investment)

Solar Project Economics – Income

- Solar Investment Tax Credit (ITC)
- Currently 30% CREDIT
- Residential and Commercial through 2021
- Commercial 10% Permanent

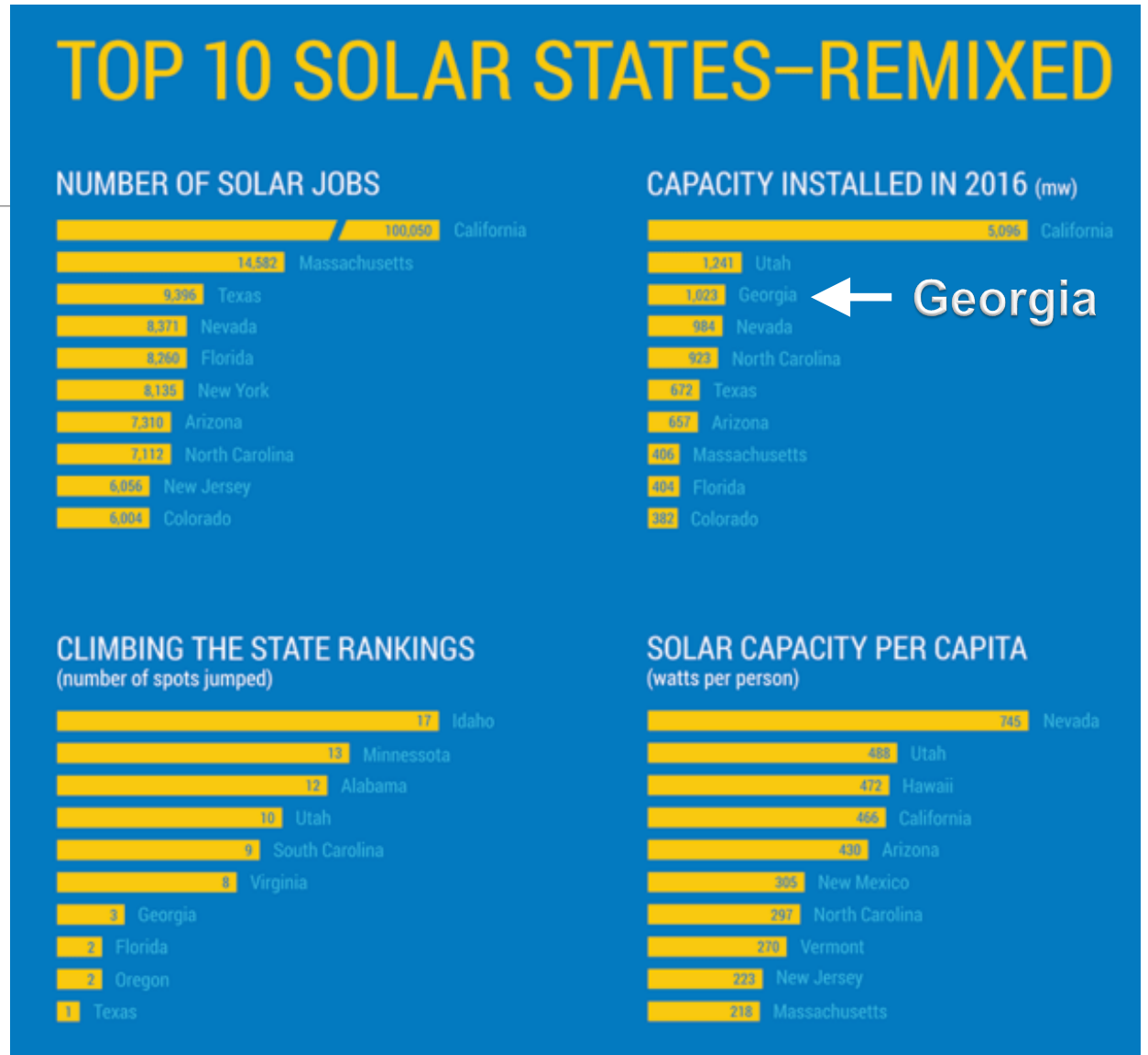


Georgia Power Integrated Resource Plan

Highlights of Renewable Energy Development Initiative (REDI)

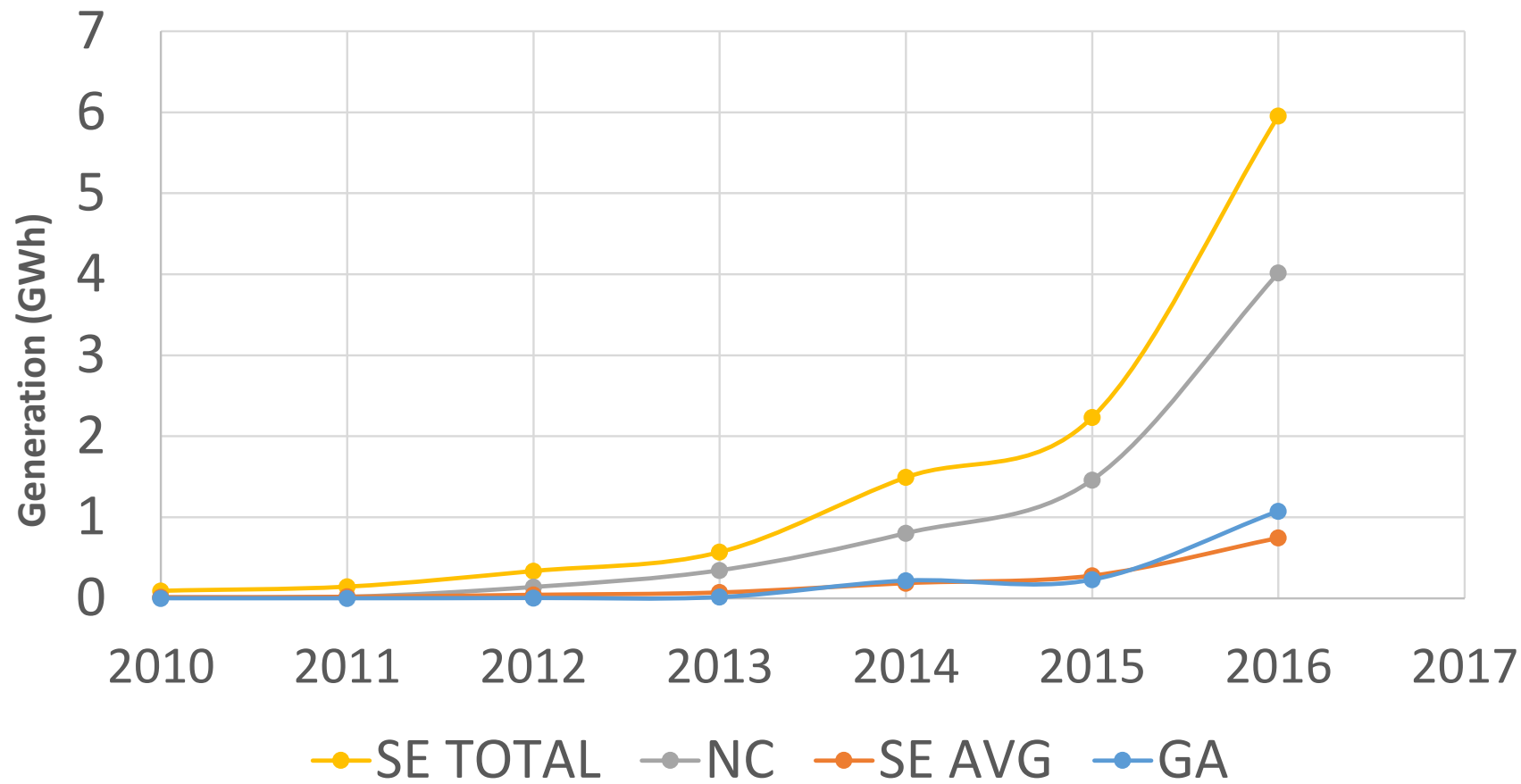
- Authorized in 2016
- Focus on utility-scale, but has provisions for commercial, industrial and distributed scale
 - 2017 target = 525 MW
 - 2019 target = 525 MW
 - Additional distributed generation (rooftop) scale = 150 MW
 - Additional Commercial & Industrial projects = 200 MW
- Must be at cost-parity with long-term, least cost alternative

US Context for Solar



Georgia →

Generation from Solar in the Southeast, 2010-16



The Southeast includes:
GA, FL, TN, NC, SC, AL, MS

Total share of solar:

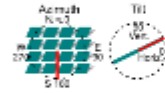
- 0.6% of generation in the entire SE
- 3.1% of generation in NC
- 0.8% of generation in GA
- NC accounts for 68% of SE Solar

ReTAP – Example Projects

- Solar Site Assessment
- Solar Proposal Review
- Biofuel Technical Assistance
- Education Programs for Solar Communities

DC Subarrays

To model a system with one array, specify properties for Subarray 1 and disable Subarrays 2, 3, and 4. To model a system with up to four subarrays connected in parallel to a single bank of inverters, for each subarray, check 1 below and specify a number of strings and other properties.

	Subarray 1	Subarray 2	Subarray 3	Subarray 4
String Configuration				
Strings in array	2 (always enabled)	☐ Enable	☐ Enable	☐ Enable
Strings allocated to subarray	2	0	0	0
Tracking & Orientation				
	☒ Fixed ☐ 1 Axis ☐ 2 Axis ☐ Azimuth Axis ☐ Seasonal Tilt	☒ Fixed ☐ 1 Axis ☐ 2 Axis ☐ Azimuth Axis ☐ Seasonal Tilt	☒ Fixed ☐ 1 Axis ☐ 2 Axis ☐ Azimuth Axis ☐ Seasonal Tilt	☒ Fixed ☐ 1 Axis ☐ 2 Axis ☐ Azimuth Axis ☐ Seasonal Tilt
☐ Tilt-latitude	☐ Tilt-latitude	☐ Tilt-latitude	☐ Tilt-latitude	☐ Tilt-latitude
Tilt (deg)	20	20	20	20
Azimuth (deg)	180	180	180	180
Ground coverage ratio (GCR)	0.3	0.3	0.3	0.3
Tracker rotation limit (deg)	45	45	45	45
Backtracking	☐ Enable	☐ Enable	☐ Enable	☐ Enable

Ground coverage ratio is used (1) to determine when a one-axis tracking system will backtrack, (2) in self-shading calculations for fixed tilt or one-axis tracking systems on the Shading page, and (3) in the total land area calculation. See Help for details.

The Georgia Solar Model Ordinance (MSO) University Team

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Turner Environmental Law Clinic



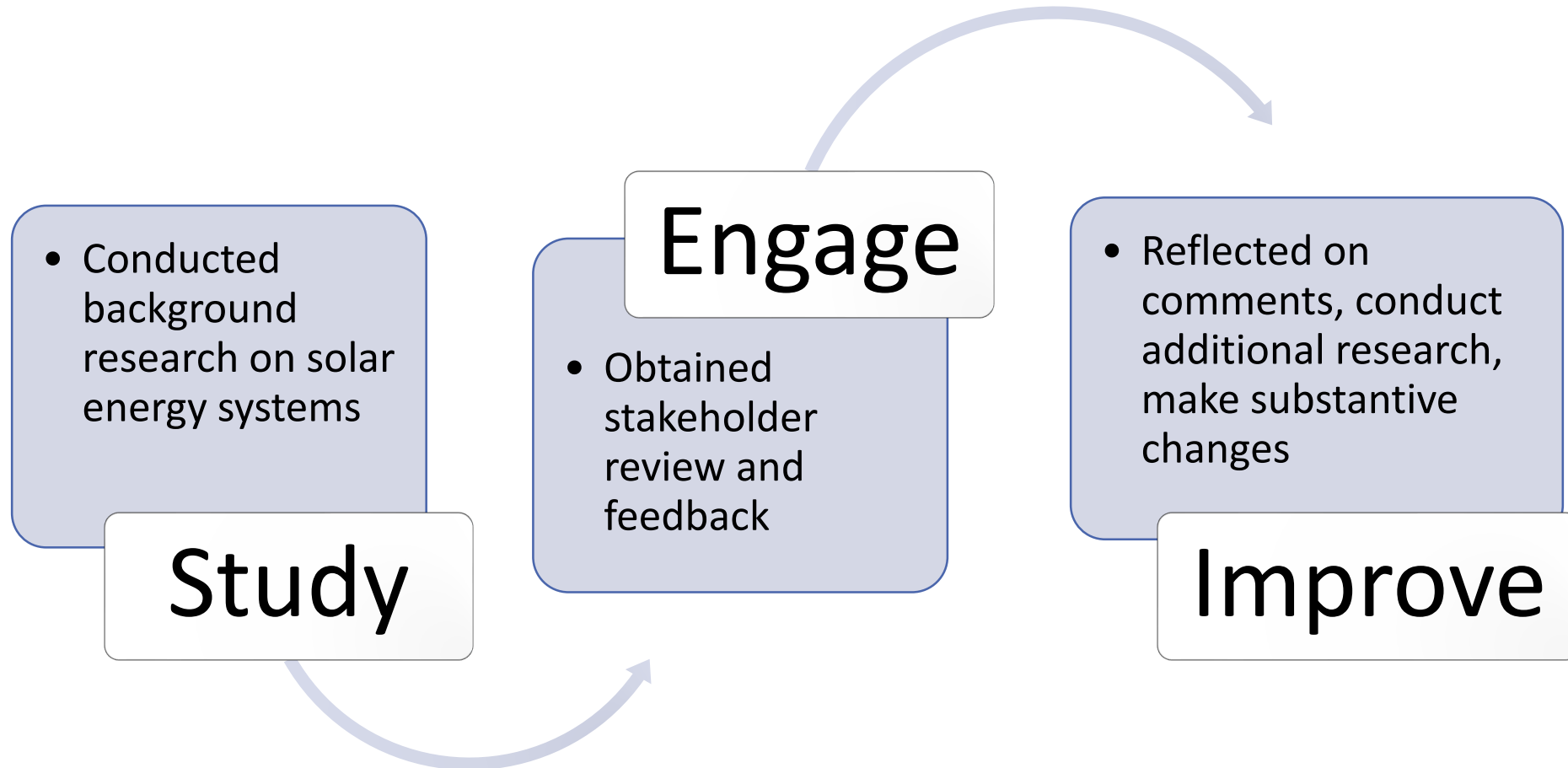
Objective

- Accelerate *smart* growth of solar in Georgia through development of a model ordinance and accompanying guide
 - Encourage solar development while protecting community culture and the environment
 - Foster appropriate siting without undue barriers to development
 - Help prevent poorly sited projects that could hamper further growth of solar
- Provide fact-based resources about solar development to decision-makers, planners, communities, and developers
- Identify realistic impacts of solar development to help avoid potential conflicts

Timeline

April – October 2017	University team coordination – initial scoping, planning, and research.
August 2017	Draft Template published.
November 2017	Pre-brief meeting held.
December 2017	Initial feedback on Draft Model Ordinance Outline & Excerpts gathered.
February 2018	Draft Model Ordinance published.
February – April 2018	Stakeholder meetings convened. Feedback on the Draft Model Ordinance gathered.
May – June 2018	Model Ordinance and Guide finalized, taking into account stakeholder input.
July 2018	Final Model Ordinance and Guide published.

Research Team Process



What is a Zoning Ordinance?



A ZONING ORDINANCE CAN

- Define what size and type of solar facilities can be located in different parts of the county or city
- Provide facility setbacks and height limitations
- Protect against nuisance and aesthetics concerns
- Define and prescribe site plan requirements



A ZONING ORDINANCE CANNOT

- Alter existing facilities
- Resolve issues related to taxes and tariffs
- Address every legal barrier to solar facilities
- Address state and federal permitting requirements
- Prescribe individual lease or finance terms

The Model Ordinance and Guide



- Permissive, but with reasonable limitations
- Focus on
 - Community Character
 - Environmental Integrity
 - Optimizing Land Use

Wildlife



Photo from [https://commons.wikimedia.org/wiki/File:Foraging_Gopher_Tortoise_\(5960563007\).jpg](https://commons.wikimedia.org/wiki/File:Foraging_Gopher_Tortoise_(5960563007).jpg).

Model

- Systems that require permits must provide information on species potentially on or next to property

Guide

- Main potential impacts of solar development
- Specific species of concern
- Best practices for siting and mitigation

Trees and Forests



Photo by Mark Merner, <https://unsplash.com/license>.

Model

- Avoid removal to extent reasonably practicable
- Comply with existing tree ordinance
- Systems that require permits must provide information on existing tree cover

Guide

- State of forests in Georgia
- Potential conflicts, but trees and solar can coexist
- Best practices for encouraging trees and solar

Optimizing Land Use

- Developed and degraded land
- Dual land use
- Agricultural land



Photo from https://commons.wikimedia.org/wiki/File:Antioch_College_solar_sheep.JPG.

Publishing and Implementing

The Model Ordinance and Guide are available online at:

<http://www.energy.gatech.edu/model-solar-ordinance>