

Synopsis of “**Renewable Energy Academy**”

by University of Wisconsin Extension

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Brought to you by RESET

RESET's work is supported by the US Dept of Energy Offc of Critical Minerals and Energy Innovation through the Reliable Energy Siting through Technical Engagement and Planning ((R-STEP) program.

RESET can provide guidance on:

- Learn about solar leasing contracts
- Understand the siting process
- Participate in public hearings and comments
- Identify community priorities
- Adopt a solar ordinance
- Negotiate contracts with developers

Information below is taken from the PowerPoint presentation at this conference (Only solar info is included below. Text in quotes usually means that this comment was made by the speaker.)

How does Wisconsin's grid work?

We are part of MISO (Midcontinent Independent System Operator) - 15 states

MISO approves all project interconnection

Where does WI electricity come from?

Natural gas ~36%

Coal ~35%

Nuclear ~15%

Solar, wind, hydro ~12% (faster to bring online - 2-5yrs, least expensive to produce)

What “energy” is being built in the US in 2026?

Solar - more than 50%

Battery storage - 25%

Wind - 12%

Natural Gas - 6%

Acreage Used:

Wind: 1 turbine (3-6 MW) uses 1-1.5 acres of land

Solar: uses 5-8 acres per MW

Battery Energy Storage Systems (BESS): 0.03-0.1 acres per MW (75 MW uses 5-7 acres)

Why build on farmland?

Need large parcels of land

Flat and ready to build

Near transmission lines (near substation and near grid)

Rooftops and parking lots are good candidates for commercial-scale, not utility-scale production

Educate landowners about solar leasing

Earnings: \$500-\$1500 per acre annually

Before signing a binding 30-year contract:

“Guide for Leasing Land for Solar Development”

“Conversations with Solar Developers”

go.wisc.edu/solarguide

Agrivoltaics

Uses the same land for both agriculture and solar

Sheep grazing is most common

Pollinator habitat helps biodiversity and builds soil health

Need to talk w developer before the contract.

Agrivoltaic practice/placement is in place of mowing which throws rocks and damages panels.

Solar Ordinance can include agrivoltaics

Utility Aid

- Paid from the state General Fund (state mandated) for any energy generating facility 50 MW or larger
- \$5,000 per MW to the jurisdictions hosting the equipment (county and town, city, or village) - 60% to county, 40% to towns + \$1000 per MW for BESS 50% to county, 50% to towns
- “Instead of property tax, once turned on, utility aid is approx 10x more than the property taxes”
- Annual payments start the year after the project is energized, and continue for the life of the project.

Q: When do the property taxes end? How big is the gap?

Google: Loss of agricultural exemption: converting farmland to a solar facility usually triggers a reclassification, ending low-rate agriculture “use-value” assessments. Most smart lease agreements require the solar dev to pay any tax increases, roll-back penalties or the entire property tax bill directly, but this must be explicitly written into the contract. *“Community Economic Development Solar Leasing Guide”*

Project Authority

- 100 MW or larger: Public Service Commission (PSC) - CPCN (Certificate of Public Convenience and Necessity) process
- Once a CPCN is approved, local gov may not inhibit or restrict the project
- State law preempts local zoning regulations

Wisconsin Farmers Union

Environmental Issues:

- Water quality
- Site Management
- Wildlife Impacts

- Land Use
- Waste Stream Analysis (important during decommissioning)
- Rural Character & Farmland Conversion
- Catastrophe Management
- Public Health & Safety
- Land Values

Water Quality

Widespread land impacts of solar (leaching from panels)

Site compaction

Grading and slope change

What's in a solar panel?

Most: crystalline silicon

By Weight: 76% glass, 10% plastic polymer, 8% aluminum, 5% silicon, 1% copper, 0.1% or less silver and other metals

Candium is being retired

Solar Panel Chemical Leaching Concerns

(study results)

PFAS leaving: none found

Heavy metals: no significant threat to soil quality

“Takeaway: relatively no concern”

Nitrates - water quality

Convert farmland to solar: increase in water quality

Site Management

- Erosion during construction
- Weed & vegetation management
- Soil compaction for subsequent crop growth
- ASK Developer: what are you planting? Native grass? How are you managing that?
- ASK Developer: Compaction - WHERE are you setting panels? Traffic control within the acreage

Wildlife Impacts

Habitat and Access: migration corridors

Fencing considerations - 8' fence common; ASK Dev to build 8" above the ground to allow for animals to get under

Waste Stream (BIG CONCERN)

Recyclability of materials: solar - somewhat

Heavy metals in panels?

Catastrophic event damage

One place in TX recycles panels

"Have a bond that addresses decommissioning (this can be a point of tension w the developer)"

Farmland Conversion

- 515,200 acres to urban sprawl (2016-2040)
- UHD (Urban and Highly Developed)
 - LDR (Low-density residential)
 - LDR paves the way for further development: Ag land that was in LDR areas in 2016 is 16 times more likely to be converted to UHD by 2050, compared to other ag land. (40-60% of WI corn is used for ethanol but is not a permanent use of the land)
- "#1 threat: low density housing development that eventually moves to high density. Concerns: what it looks like. Comprehensive Planning is important."
- ASK Developer: Show me your decommissioning process

Source: AFT Farms Under Threat 2040 Wisconsin Scenario (2022)

Farmland Conversion: Solar Projects

"Ground-based solar energy is not expected to exceed 5% of any state's land area, with the exception of Rhode Island (6.5%)" *US Dept of energy 2021*

Figure 10: Wisconsin actively cultivated farmland relative to land needed for solar by 2050:

Solar PV land area = 1.39%

Catastrophe Management

Fires (mostly w BESS - battery storage)

High winds

Tornadoes

Flooding

Hail damage

ASK: what is your emergency response plan? How are you prepared?

Public Health & Safety

Construction noise (solar during construction. ASK: what is the compensation for this?)

Inverter noise with solar. Inverters are centrally located. Ask for a map

Catastrophic event impacts

Glare

Stray voltage: not really a prob w solar as the panels are grounded every 10'. This is a concern with the expansion of transmission lines.

Microclimates: impact is unclear - panels make the air above 2 degrees warmer. Under the panels, the temperature is lower.

Land Values

Residential values fall when the project is new and rebound once the area is "used" to it.

Cropland values: within 2 miles of solar say 19% increase in value (Virginia Tech 2025 study)

This all needs Competent Good Faith Actors and Trust

“If the developer sees that you want to SOLVE the problem, then there’s room for a back-and-forth discussion.”

Promote open discourse

What can Communities do?

- Document community priorities
- Update Comprehensive Plans and maps (Developer reads this. PSC reads this)
- Adopt local ordinances (solar: less than 100 MW)
- Participate in PSC proceedings
- Negotiate developer agreements

“Wisconsin Community Perspectives on Large-Scale Solar and Wind Development”

UW-Extension (currently in its final draft)

- Electricity and Large-Scale Solar and Wind
- Law, Policy, and Planning
- Economics
- Environment
- KLand Use
- Health and Safety
- Emergency Response, fires, Toxins, Stray Voltage
- Decommissioning/end of life

What to add to Comprehensive Plan

PSC: For projects over 100 MW, the PSC must determine if a project "unreasonably interferes with orderly local land use." Updated CPs provide PSC with clear guidance.

- Future growth areas
- Annexation possibilities
- Utility and sewer expansions
- Environmentally sensitive resources
- Agricultural priorities
- Community vision and goals

“The developer will have also looked at your CP closely.”

TNC’s (The Nature Conservancy) Renewable Opportunity Explorer

Map program that guides the project development to have low impact and maximize community, conservation, and climate benefits.

“This is an open-access tool to guide developers into having low impact.”

Siting Authority

- Under 100 MW: CUP authority.
 - Must be supported by “substantial evidence,” not public opinion
 - Authority to restrict systems is limited by 66.0401
- If solar project application satisfies all CUP requirements, it must be approved
 - Over 100 MW: PSC has authority. State law preempts local zoning regulations

Solar Regulation Guidance (presentation by Bill Oemichen, attorney, UW-Extension)
“Solar Regulation Guidance for Wisconsin Counties, Cities, Villages and Towns”
go.wisc.edu/solarordinance

- How utility-scale solar project siting works
- What local governments can and cannot do and the legal background on why

Presentation slides pertained to solar projects under 100 MW.

“Model Solar Zoning Ordinance”

go.wisc.edu/solarordinance

For counties, cities, villages, and towns with zoning authority.

Focuses on Locally Permitted Solar Energy Generating Systems under 100 MW.

Siting Projects 100 MW and Larger

10 minute video by the PSC explaining their process

JDA Negotiations

(Lynn Markham, Land Use Specialist, WI Land+Water)

These contracts are voluntary, binding contracts governed by contract law

“Solar Contracts Between Local Governments and Solar Developers”

wisconsinlandwater.org/solarcontracts

- Summary of existing contracts (compared 20 JDAs)
 - Standards to consider
 - Explanation for each standard
 - Most favorable language found
 - Copies of 14 Wisconsin solar contracts
 - (IDEA: look at each one to see what attorney wrote it)

8 out of 10 solar developers have signed solar contracts for all their projects.

NextEra \$Energy and Qcells have projects without solar contracts

(wisconsinlandwater.org/solarcontracts)

Do Counties & Towns work together?

- Collaboration is common - develop contract terms together
- Each brings value - Towns know local landowners and community concerns; Counties provide planning conservation, legal expertise, and staffing
- Roles may vary - either the Towns or Counties may lead negotiations
- Separate agreements are often needed: Different jurisdictions control different roads and responsibilities
- Multi-jurisdiction projects may require regional coordination

JDAs can include:

- Road use, damage & repair obligations - which roads to use
- Utility aid payments to local governments
- Noise, lighting and glare standards
- Decommissioning and financial assurance
- Road and neighbor setbacks

- Community amenity and benefit payments (be sure to ask for unrelated things, i.e. built a community center, workforce assistance)
- Lost tax revenue to schools and tech colleges
- Conservation: topsoil (leave onsite), erosion, stormwater, fencing, vegetation standards)
- Reimbursement for professional services

Solar Contract Standards (handout): 24 standards to consider

See handout attached

Contract Example: Road use and repair obligations

- Designate approved truck routes - need signage
- Consider penalties if undesignated roads are used (enforcement?)
- Local government sets road weight and speed limits for the project
- Require road condition report by mutually agreed upon expert before and after construction; paid by developer
- Developer pays for road damage and repairs - a percentage because of regular use by local truck traffic
- Include private roads and driveway standards
- Require cleanup of mud and debris - OR have the local entity hire this out and charge developer after

Contract Example: Siting to reduce impacts on wildlife

Avoid siting arrays on or next to state wildlife areas; array fencing can be a barrier

Divide large arrays (320 acres or greater) into smaller arrays to provide wildlife corridors

Maintain wildlife corridors along all waterways

Contract Example: Fencing to reduce impacts on wildlife

- Use wildlife-friendly fencing
 - Raise fence 6-8 inches off the ground or use fence with large openings near the BOTTOM
 - Avoid barbed wire on fences around arrays
 - Minimize fence height where possible
 - Solar Arrays: 8' fencing ("National Electric Code requires fencing to prevent access and vandalism:)

Contract Example: Decommissioning and site restoration

Q: "Can the developer/owner choose to continue the solar installation and just re-sign the landowner contracts? YES. Won't the technology change drastically in 30 years to possibly make it a lot easier to continue the installation rather than decommission? YES. However, you still must address decommissioning in the JDA."

- Developer is responsible for decommissioning
- Define what equipment must be removed and to what depth considering future land use
- Set a clear timeline for site restoration
- Restore soils and vegetation

Favorable decommissioning language:

Within 90 days of the start of construction the developer shall provide the Town(s) with cash, a bond, or a letter of credit to cover 10% of the estimated "Net Decommissioning Costs." On or before the fifth anniversary of the project's operation date the developer shall provide the Town(s) with cash, a bond, or a letter of credit to cover 50% of the estimated "Net Decommissioning Costs." On or before the tenth anniversary of the project's operation date the developer shall provide the Town(s) with cash, a bond, or a letter of credit to cover 100% of the estimated "Net Decommissioning Costs." (Maple Grove Solar, 6)

Decommissioning - When?

"The decommissioning plan shall require at least the following to be completed within 12 months after the project is done operation: removal of all above ground components with proper dismantling and restoration of the property to a reasonably similar condition as prior to construction using decompaction and reseeding." (Wood County, 3)

Decommissioning - What will be removed?

"Remove, at its expense, all Project components including, but not limited to, solar arrays and associated facilities to dept of 4 feet and properly dismantle all components; Restore the land to a condition reasonably similar to pre-existing conditions, which shall include the removal of gravel parking lots and storage yards, de-compacting areas where Project access roads were installed, and de-compacting any other areas of substantial soil compaction." (Darien, 22)

Upcoming Events:

- Renewable Energy Cohort Webinar Series
 - Visit: go.wisc.edu/resetevents to register
- Renewable Energy Academies
 - Stevens Point (Oct 7)
 - Ashland: (Nov 5)
 - go.wisc.edu/REA
- BESS and Solar Tour in Potosi (Oct 22)
 - go.wisc.edu/resetour
- Siting Smart with tools for Renewable Energy Planning webinar:
 - Naturewi.org/renewablesNov10
 - Naturewi.org/renewablesnov16