

SMALL SOLAR FARMS - WHY MORE ARE NEEDED

- Michael Vickerman
- Policy Director
- RENEW Wisconsin
- Energy Fair – 2022
- Custer, WI



*On the border
between City
of Madison
and Town of
Cottage Grove*



My role as RENEW's Policy Director:

PROBLEM-SOLVING



Problem to solve:

How to expand clean energy options in the state of Wisconsin as expeditiously as possible

Because we haven't a minute to waste.

WHAT FLAVORS OF SOLAR ARE NEEDED FOR THE FUTURE?

All are needed!



Chris Clark, ceo, Xcel

Utility-scale – transmission/bulk

Utility-scale – distributed applications

Rooftop – commercial & industrial

Rooftop – residential

Solar-powered transportation

GOOD IDEAS THAT KEEP RUNNING INTO ROADBLOCKS

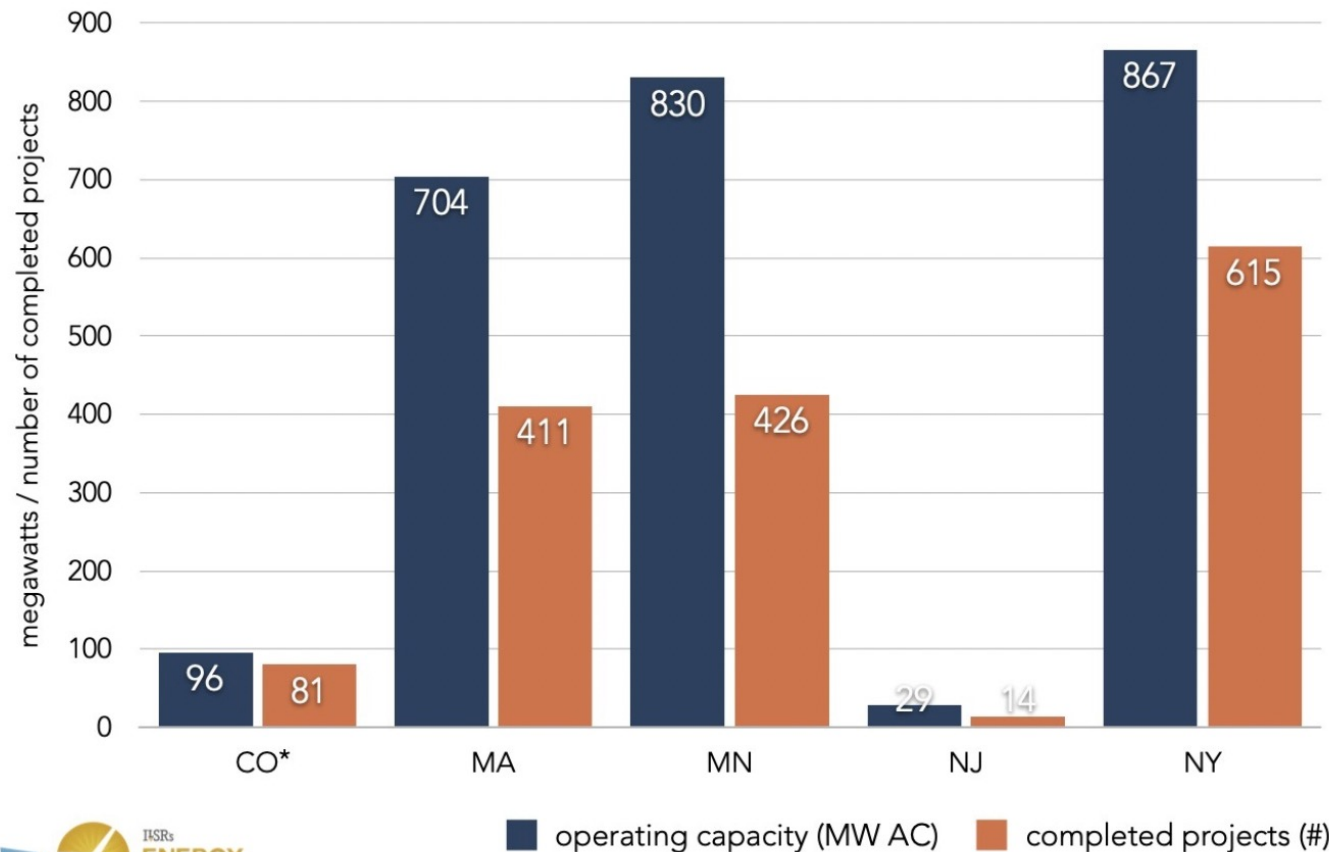


- ☐ Third party financing of customer-sited solar power
- ☐ Charging electric vehicles at service stations
- ☐ Building electrification → solar + heat pumps
- ✓ Small-scale solar farms (a/k/a community solar)

Updated Quarterly

STATE COMMUNITY SOLAR PROGRAMS

STATUS UPDATE: 2022 Q1



Wisconsin has 7.1
MW of community
solar, six arrays

MGE 4.0
Xcel 2.1
WPL 1.0

Hodag Solar Park Rhineland, WI

7.5 megawatts(AC)

14.5 – 15 million
kWh/yr

Developed by
OneEnergy Renewables

Owned by Wisconsin
Public Service Corp.

Bifacial panels



These solar panels at the Hodag Solar Park are collecting every bit of winter sun, both from the sky and the rays reflected from the snow. WPS began operations at the facility located in the Town of Crescent last month. Photo by Eileen Persike.



Badger Hollow 1
Iowa County
150 MW
Online December 2021

This is a large solar farm, one of
the largest in Wisconsin

DEFINITION – SMALL SOLAR FARM

- ❖ Front-of-meter installation
- ❖ Generation remains within utility distribution system – does not enter transmission system
- ❖ $< 0.5 \text{ MW} < 20 \text{ MW}$

ATTRIBUTES – SMALL SOLAR FARM

- ❖ Very few landowners involved
- ❖ Relatively fast turnaround for permitting + construction
- ❖ Flexible siting – urban or rural settings
- ❖ Flexible uses – can serve:
 - Rate base
 - Individual customers (onsite and offsite)
 - REC (renewable energy credit) markets

SMALL SOLAR FARM PORTFOLIOS

- ❖ OneEnergy Renewables
 - Mastodon Solar (2021)
 - Butter Solar(2019)
- ❖ Engie – Dairyland portfolio (2016-2017)
- ❖ MGE – Renewable Energy Rider/Shared Solar (2019-2022)
- ❖ WEPCO – Solar Now (ongoing, started in 2019)

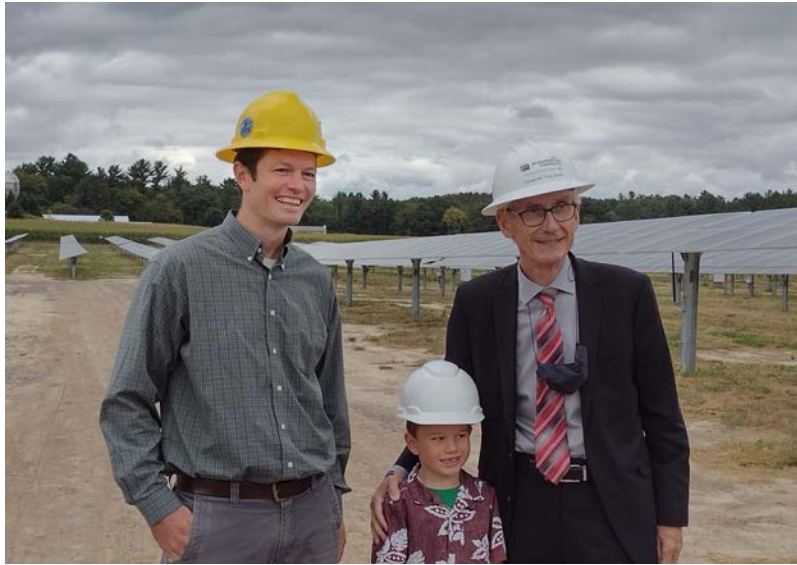
IMPORTANT NUMBERS TO REMEMBER

- 7 acres to 1 MW of solar
- 1 MW solar → 2,000 MWh/year*
- 1 MW solar → 200 WI households

*Assumes panels are mounted on single-axis trackers



Stromland Solar -- Buffalo County -- 3 MW

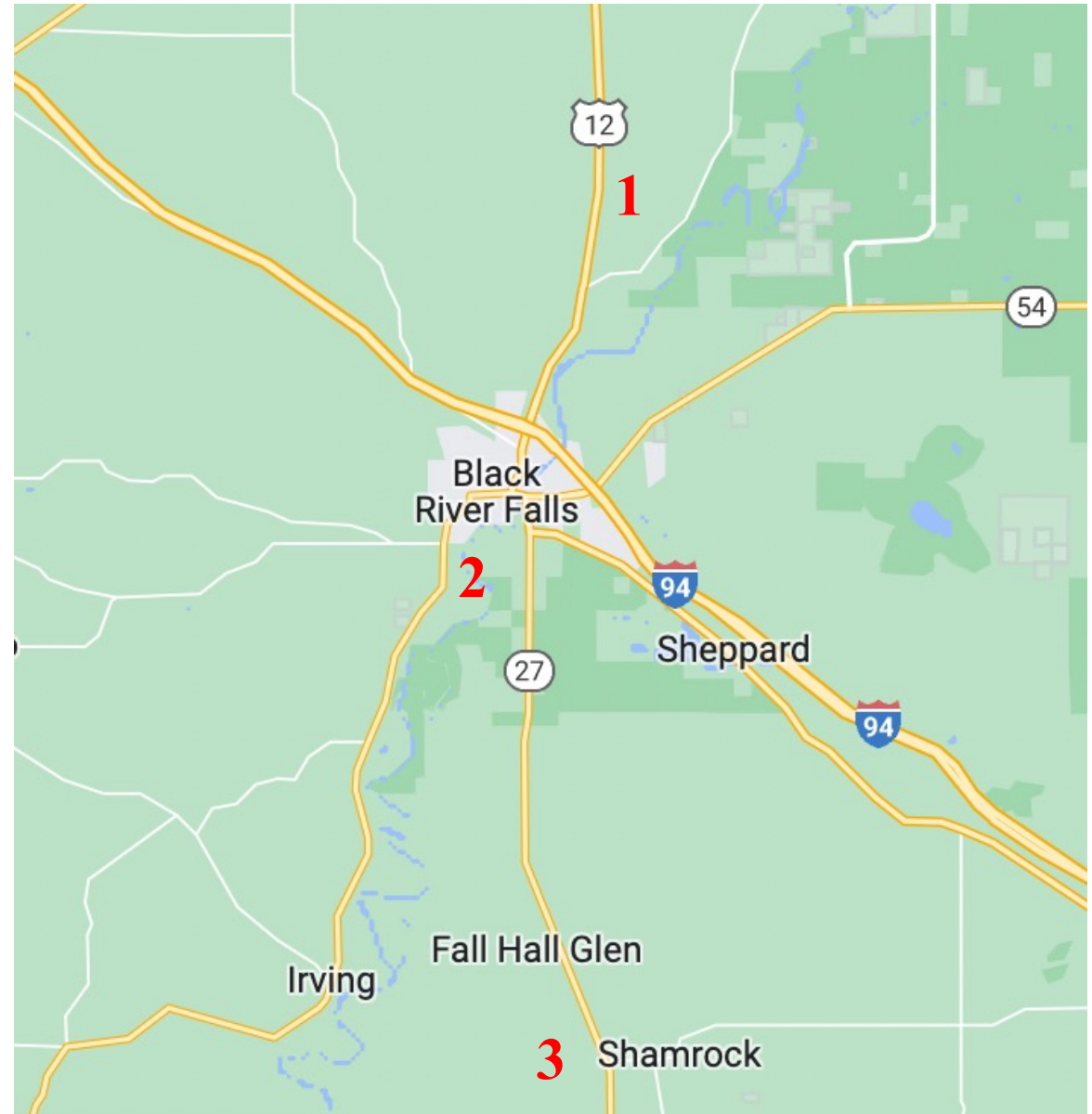


MASTODON SOLAR PORTFOLIO

Mastodon Solar

Jackson County Arrays

- | | |
|-----------------|--------|
| 1) Strobos | 1.5 MW |
| 2) Blue Prairie | 2.5 MW |
| 3) Shamrock | 3.0 MW |



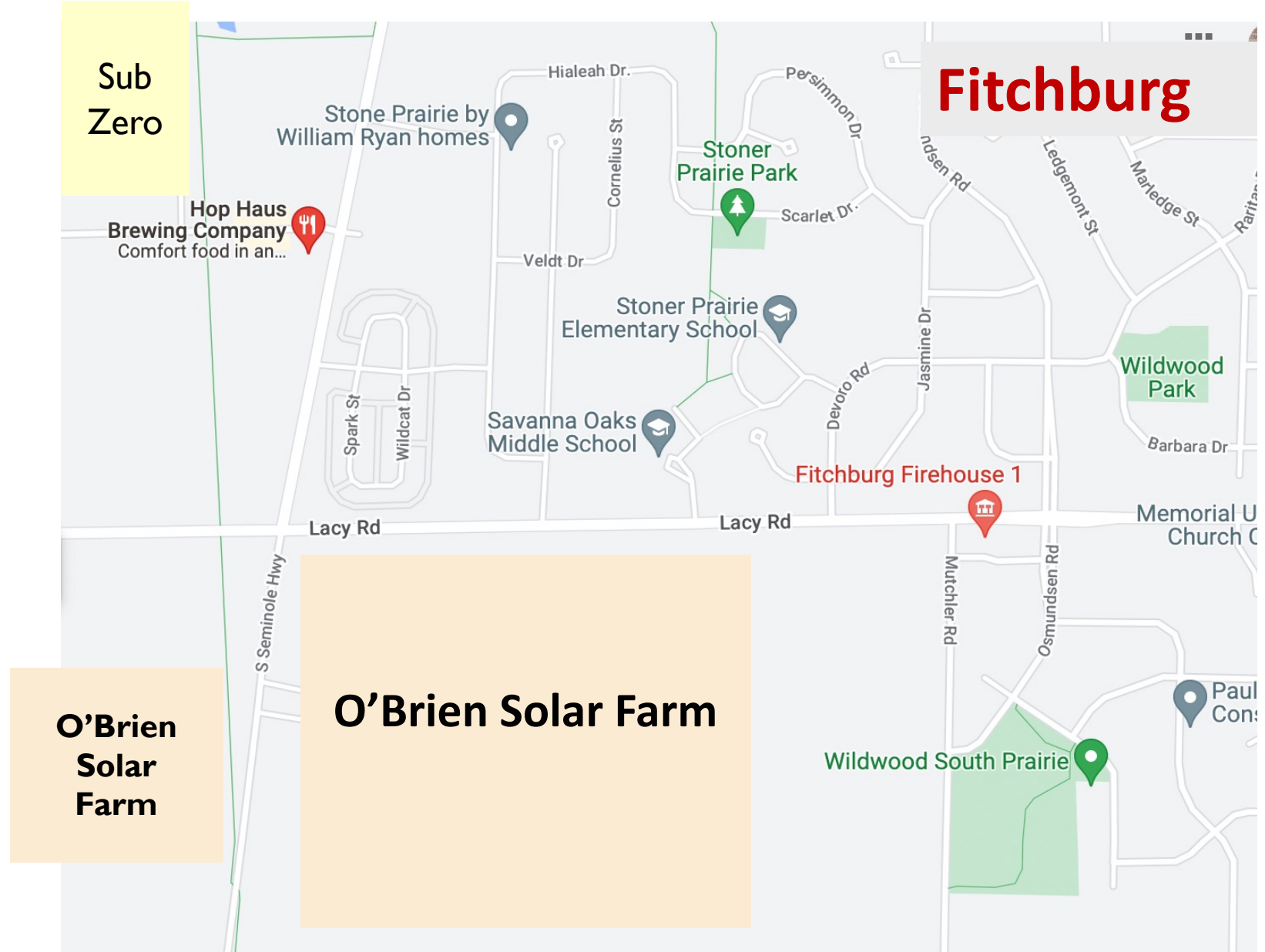
URBAN SETTING

O'BRIEN SOLAR FIELDS



Fitchburg
20 MW

A 20 MW SOLAR FARM ON THE EDGE OF TOWN



SOLAR POWER FOR OFFSITE CUSTOMERS



MADISON METROPOLITAN
SCHOOL DISTRICT



Hermsdorf Farm

8 MW

May 2022

*An MGE-
owned
Renewable
Energy Rider
project serving
two large
nonprofit
customers*

MGE'S SMALL SOLAR FARMS AND THEIR OFFSITE CUSTOMERS

Middleton Morey Airport (5 MW)

- City of Middleton
- Middleton-Cross Plains Area School District
- Shared Solar subscribers

Dane County Airport (9 MW)

- Dane County

O'Brien (20 MW)

- State of Wisconsin, UW-Madison, City of Fitchburg
- Placon, Promega, Willy St. Coop, Tribe 9 Foods

Hermsdorf (8 MW)

- City of Madison
- Madison Metropolitan School District



2019 RENEWABLE ENERGY PROJECT OF THE YEAR

BUTTER SOLAR

Cashton array • 2 MW

Butter Solar represents the culmination of a unique public-private partnership involving an independent power developer and its partners, municipal utilities, a food cooperative, and a city government.



Argyle array • 700 kW **Upper Midwest Municipal Energy Group**



UMMEG and its
member
communities
purchase the
output from the
solar arrays
developed by
OneEnergy
Renewables.



Elroy • 1.5 MW



New Lisbon • 2.5 MW

At the same time, Organic Valley and the City of Madison purchase the renewable energy attributes associated with the solar output, providing another revenue stream that contributes to the project's financing.

WITH THE REC PURCHASE ...

Organic Valley Becomes 100 Percent Renewably Powered

Largest Food Company to Source All Its Electricity from Renewable Sources Brings Cost Savings to Rural Midwest

Organic Valley, August 01, 2019

[Organic Valley](#), America's largest cooperative of organic farmers and one of the nation's leading organic brands, today announced that construction of three community solar projects totaling 12.67 MWdc is complete, making the cooperative the largest food company in the world to be 100 percent renewably powered. These solar projects are part of the 32 MWdc Butter Solar Portfolio ("Butter Solar") which is owned and operated by [BluEarth Renewables](#) US.

MIDWEST ENERGY NEWS

LOCAL
GOVERNMENT

By Kari Lydersen
March 24, 2017

Wisconsin's capital city sets a high bar with ambitious renewable energy goal –
100% RE by 2030



Madison, Wisconsin committed to getting **100 percent of its energy from clean, renewable sources** in a resolution passed unanimously by the City Council on Tuesday. It became the **24th city** to make such a promise.



Note: Covers City of Madison operations, including transportation and heating. **

REC's from five Butter Solar arrays will account for 1/3rd of Madison's clean electricity goal

Sheep from a neighboring farm demonstrating their value as a vegetation management tool at Butter Solar's Cashton array.



A neighboring farm's sheep herd helps manage the organic pasture where the new solar project is located. *Courtesy of Lexi Leum from Organic Valley*

|

HOW MUCH SOLAR CAPACITY IS UNDER ACTIVE DEVELOPMENT?

Twelve approved solar farm CPCNs (2 ½ now operating)	2,149 MW		
Three pending solar farm CPCN applications (100 MW+)	500		
Nine approved utility-owned solar farms (50-99 MW)	563		
Four MGE RER/shared solar projects (all operating)	42		
Seven small solar farms (5 operating, 2 planned)	22	64	~2%
35 farms	Total	3,276 MW	

3,276 MW solar = 9% of Wisconsin's electricity sales by 2026

THE POLICY CASE FOR SMALL SOLAR FARMS

- Many developable sites in Wisconsin
- Generation is community-scale (local)
- Finite supply of sites accommodating large-scale solar
- High level of support with host communities
- Economics between small and large solar farms can be similar
- Large solar farms alone can't take utilities all the way to zero carbon

BARRIERS IMPEDING THEIR GROWTH

- Utilities are wedded to economies of scale
- Utilities are invested in protecting their generation monopolies
- IOUs averse to buying power from independents
- Difficult for developers to secure fixed long-term contracts
- Utilities control interconnection to the wires (leverage)
- Most (not all) utilities are indifferent to customer aspirations

POLICIES/PRACTICES FOR GROWING THIS SEGMENT

- Affirm 3rd party financing of solar for host customers – **ongoing!**
- Long-term contracts for developers - **ongoing**
- Fixed and fair power purchase terms - **ongoing**
- Customer commitments to aggressive decarbonization
- Community solar legislation – **next year?**
- In the meantime, invest in SolarShare Wisconsin!

RENEW LAUNCHES SOLARSHARE WISCONSIN CO-OP



Visit us at Booth A17 on June 24-26 in Custer, WI

SolarShare WI Cooperative advances clean solar energy in Wisconsin by providing an easy option for local citizens to invest in community and utility-scale solar energy projects

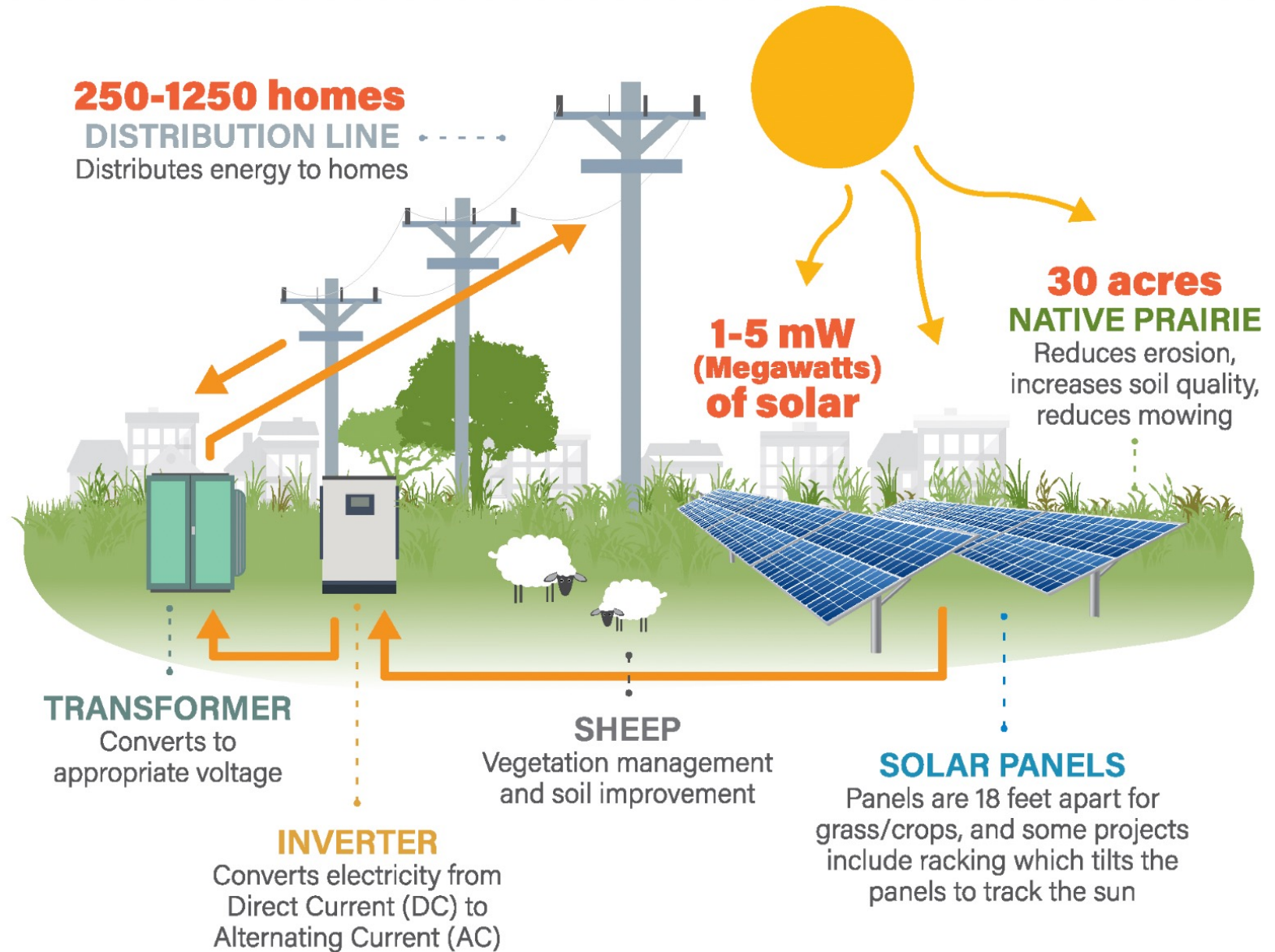


An investment and development platform for spreading solar around WI

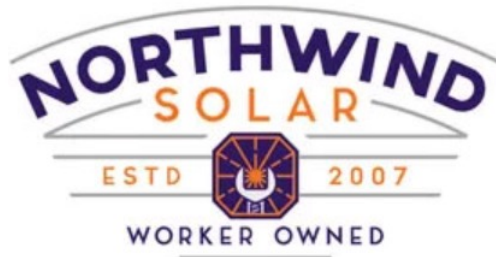
THE VISION FOR WISCONSIN:

COMBINING LOCAL RENEWABLE POWER WITH REGENERATIVE AGRICULTURE

<https://solarshare.coop/>



Partners

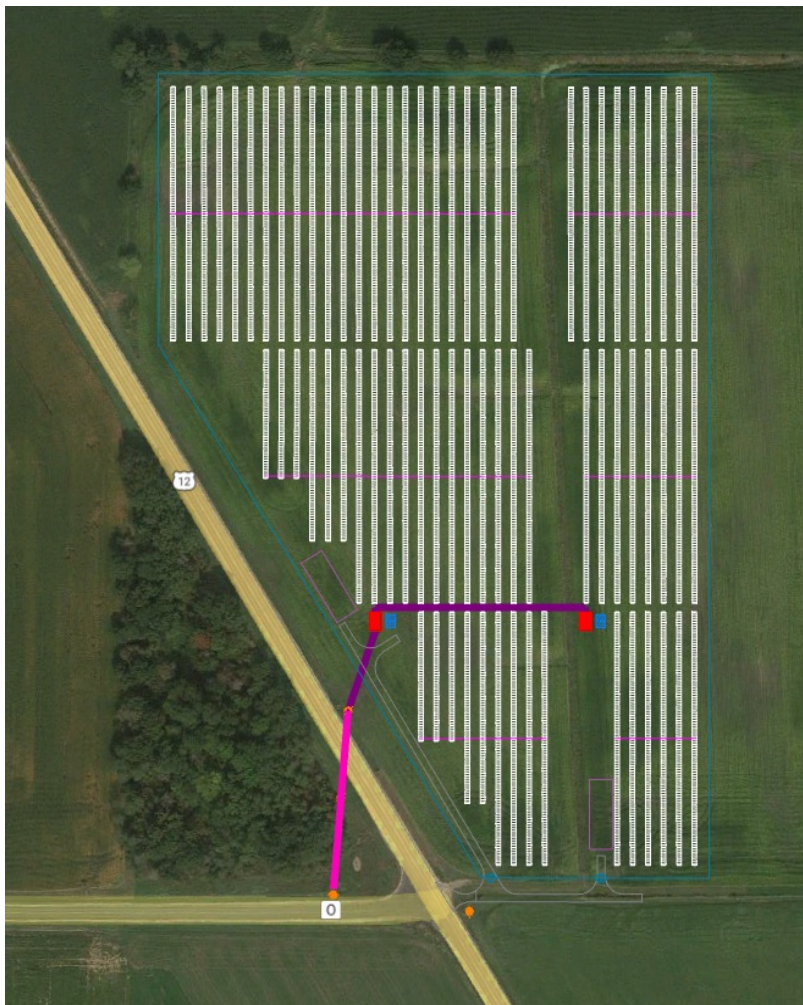


WEBSTER CREEK SOLAR FARM



Peak Output	1.5 MW
Expected Annual Energy Production	~3,000,000 kilowatt-hours
Homes Powered	375
# of Panels	~3,400
Racking Type	Single Axis Tracking
Project acreage	~12
Planned vegetation	Pollinator planting within and around panels

LEMONWEIR SOLAR FARM



Project Size	3 MW
Expected Annual Energy Production	~6,000,000 kilowatt hours
Homes Powered	~750
# of Panels	~6,800
Racking Type	Single Axis Tracking
Project acreage	~24
Planned vegetation	Pollinator planting within and around panels



QUESTIONS?

MICHAEL VICKERMAN, RENEW WISCONSIN

SMALL SOLAR FARMS – WHY MORE ARE NEEDED • JUNE 24, 2022