



# RENEWABLE ELECTRICITY & HEATING: LARGE SCALE SOLAR

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## Renewable Electricity & Heating Working Group

Items we are developing action plans for:

1. **Large-scale solar (today)**
2. **Energy Storage (today)**
3. Large-scale wind
4. Solar education
5. Municipalities' renewable energy goals
6. Biogas and biodigester



*Solar & Bees, MN.  
Photo: Fresh Energy*

Many other opportunities have been discussed across broad topical areas:

- Utility-scale renewables
- Customer-sited renewables
- Biodigesters
- Renewable heating
- Education
- Financing Tools



**Goal: 1/3 of Current Electricity Needs Coming from Large Scale Solar Farms  
1,200 megawatts of solar power**



*Solar in Downsville, WI  
Photo: Dairyland Power*

Greenhouse Gas Reductions:

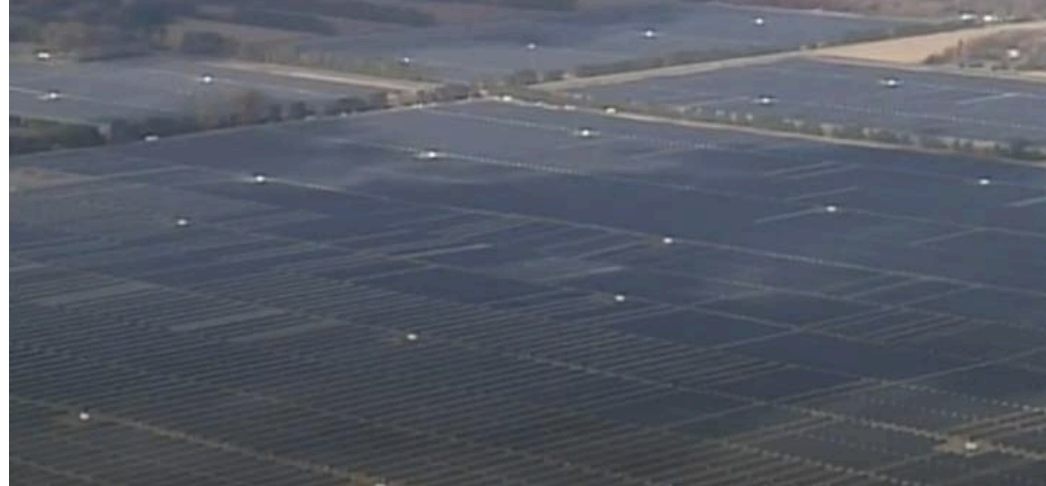
1.7 to 2.3 billion tons of CO<sub>2</sub>

Project Cost:

\$1.1 billion dollars, through utility investments and flowing through electric rates. May have a minimal “incremental cost” depending on cost of various alternatives.



## Goal of ~ 1/3 of Current Electricity Coming from Large Scale Solar Farms 1,200 megawatts of solar power



*100 megawatts of solar, Chisago County, MN  
Photo: KARE-NBC 11, Minneapolis*

### Economic Benefits: “High”

- Jobs
- Landowner Payments \$3.6-\$5.0 million annually
- Local Government Payments \$4.8 million annually
- Keeping dollars in-state instead of coal, natural gas imports

### Feasibility: “High”

- 7,200 acres needed = 0.08% of WI farmland
- Solar’s costs have declined and it is cost-competitive
- WI utilities actively exploring solar advances
- 4000+ megawatts in early-stage development in WI.





# WIND & SOLAR ARE ON THE HORIZON

*Wisconsin Solar & Wind  
in April 2018 MISO  
Queue:*

*Queue:*

*4,260 MW Solar*

*1,300 MW Wind*

*170 MW Battery*

*If all this were built:*

*9.4% Solar*

*+6.7% Wind*

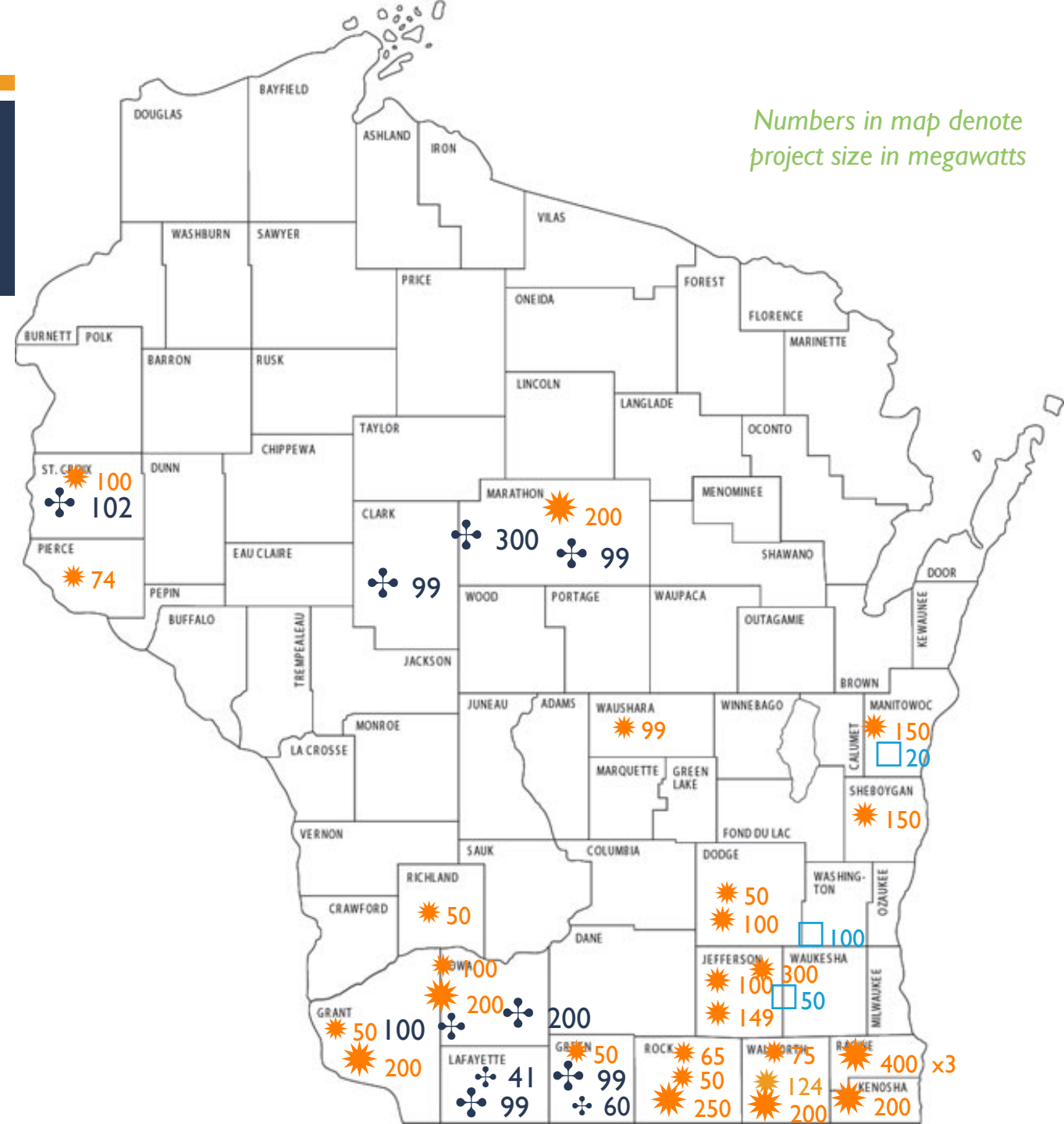
*25% Total Renewable Electricity*

*\$22 million to local governments and*

*~\$28 million to landowners annually*



*Numbers in map denote  
project size in megawatts*



## Goal of ~ 1/3 of Current Electricity Coming from Large Scale Solar Farms 1,200 megawatts of solar power

### Timing

- Starting now and ongoing for next 12+ years

### Equity Considerations – “Medium”

- Sited in rural WI / rural Dane County. Revenues to rural landowners and local governments
- If costs are comparable to other ways of generating power, negligible negative effects on consumers of various income levels
- Potential for job creation, filling jobs with local people. Solar employment is increasingly diverse (28% women, 17% Latino/Hispanic, 7% African-American); 9% Veterans



Workers install solar in Florida  
Photo: Google Images



## Goal of ~ 1/3 of Current Electricity Coming from Large Scale Solar Farms 1,200 megawatts of solar power

### Health Benefits to Dane County:

- “Medium”
- Offsetting coal and natural gas usage, reducing air pollution
- But, little of that is generated in Dane County today.
- Consideration of health benefits of solar products in their life cycle, manufacturing, components

### Adaptation:

- “Medium”
- Using native prairies under/around solar arrays could increase soil depth, ability to absorb rain
- Improves habitats for native and important bee and butterfly species

