



WIND ENERGY

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DECEMBER 7, 2018 – DANE COUNTY COUNCIL ON CLIMATE CHANGE



Renewable Electricity & Heating Working Group

Completed Action Plans:

1. Large-scale solar
2. Energy Storage
3. Solar education
4. Municipalities' renewable energy goals

Today:

5. Wind Energy

Still to Come:

6. Geothermal & Electrified Heating (yet to come)



Goal: 50% of Current Electricity Needs Come from Wind Energy

570 to 715 megawatts of wind will be needed to meet this goal.

(baseline: ~2.8% of Wisconsin's electricity production currently comes from wind – 746 megawatts)

Likely to be a mix of Wisconsin-based and Midwest/Regional Wind Projects

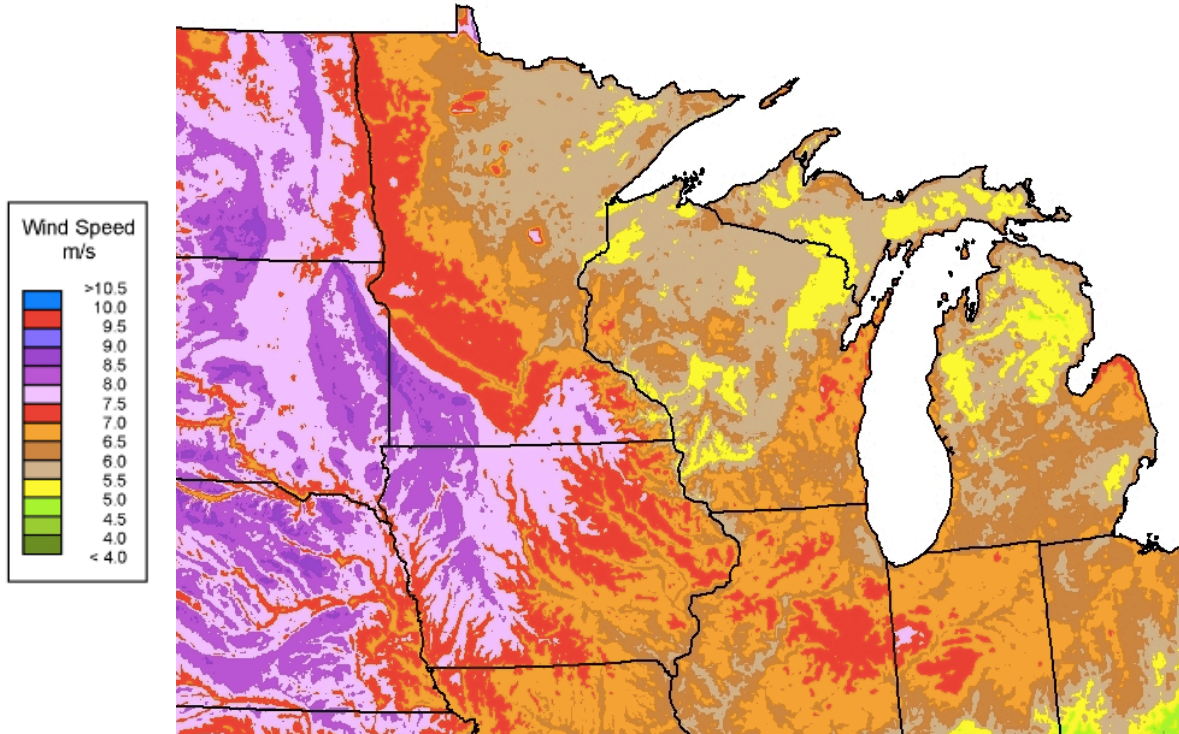
A variety of factors will determine this mix:

1. Cost and Price
2. Proximity to the electric grid
3. Congestion within the regional transmission system
4. Wind resource characteristics
5. Technology improvements in wind turbines, and
6. The marketplace and technology for energy storage

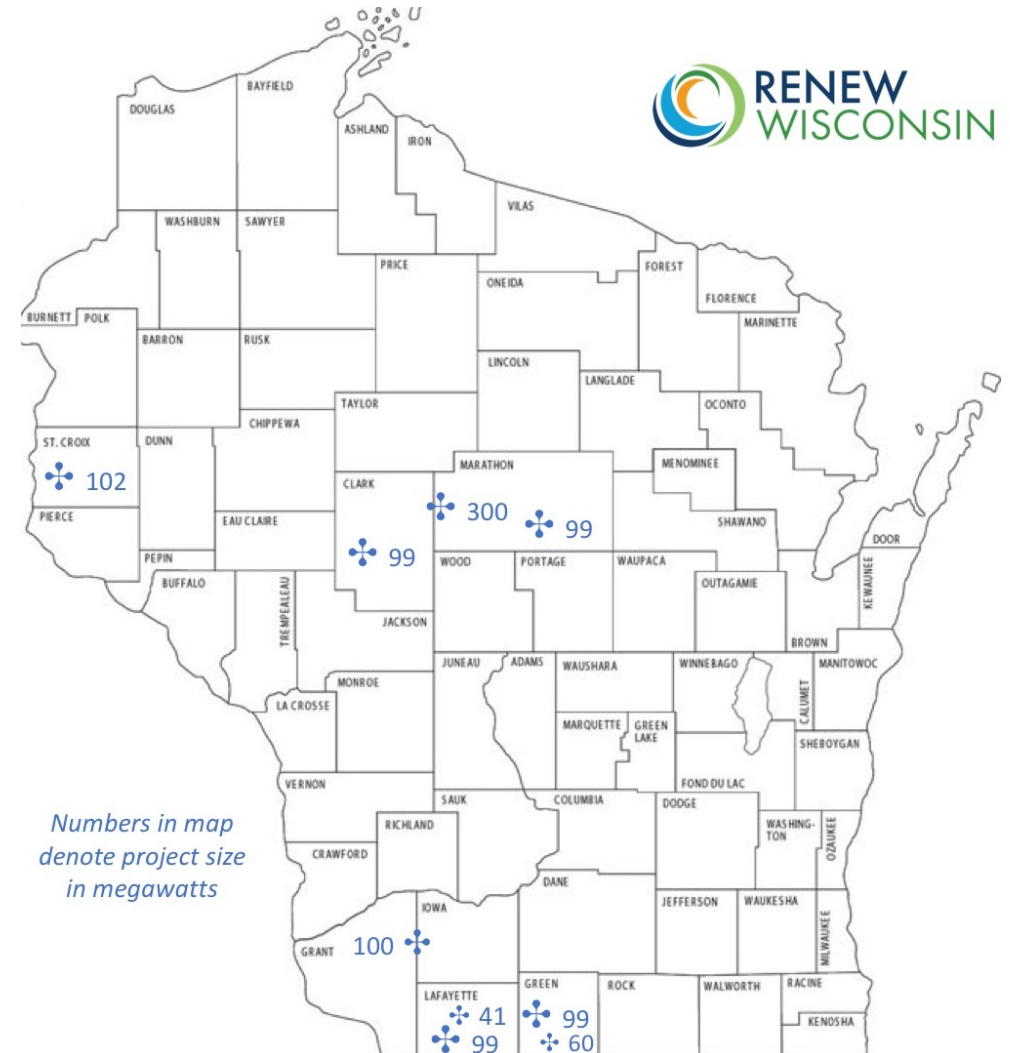


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Wind Speeds in the Midwest



Active Wind Developments in Wisconsin



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Greenhouse Gas Reductions:

Replace 2.5 billion megawatt-hours of electricity with wind power

Reduce 2.43 billion tons of CO₂

Project Cost:

\$970 million to \$1.2 billion

Wind energy is basically “cost-effective” for utilities. Would be paid by utilities, and by customers as wind energy is added to or replaces existing power plants.



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Economic Benefits: "High"

- **Electric costs:** wind energy is cost-competitive, should not impact electric rates very much
- **Job Creation:** 343-429 FTE for construction and interconnection
34-57 FTE for operations and maintenance for life of projects
- **Landowner Lease Holders:** \$4000-\$7000 per turbine; could provide \$1.14 to \$2.50 million annually
- **Projects in Wisconsin:** Local townships/counties receive combined \$4,000 per megawatt per year. Example, if 200 MW built in Wisconsin, this would be \$800,000 annually
- Projects in and closer to Dane County will likely produce more job creation and farmland preservation benefits for Dane County

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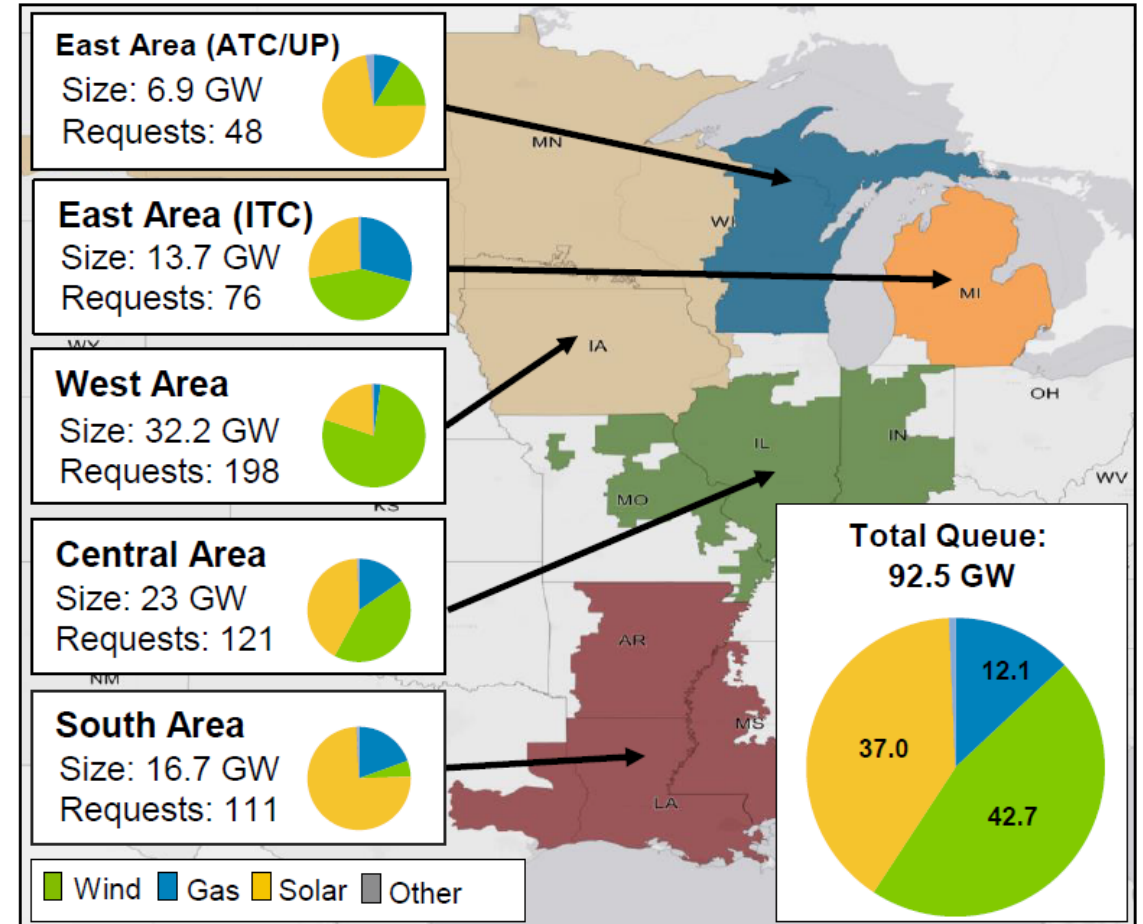
Feasibility: “High”

- Wind development is happening at a fast pace
- 570 – 715 megawatts of wind is feasible
- 1,100 MW in consideration in WI; 5,000+ MW in Iowa/MN

Timing

- Projects could be built and operational by 2030 or sooner

MISO Active Queue by Study Area



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Equity Considerations

- Sited in rural areas; will provide infusion of revenue to rural Wisconsin and rural Midwest communities

Health Benefits to Dane County:

- “High”
- Replaces fossil fuel power with zero emission; reduces carbon, NO_x, SO_x, mercury, and other pollutants that are harmful to human health
- No peer reviewed evidence that wind turbines impact human health

Adaptation:

- Does not directly increase resiliency
- Reduces greenhouse gases





WIND ENERGY - THANK YOU! Q&A

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