Regional and Community Perspectives on Distributed Wind

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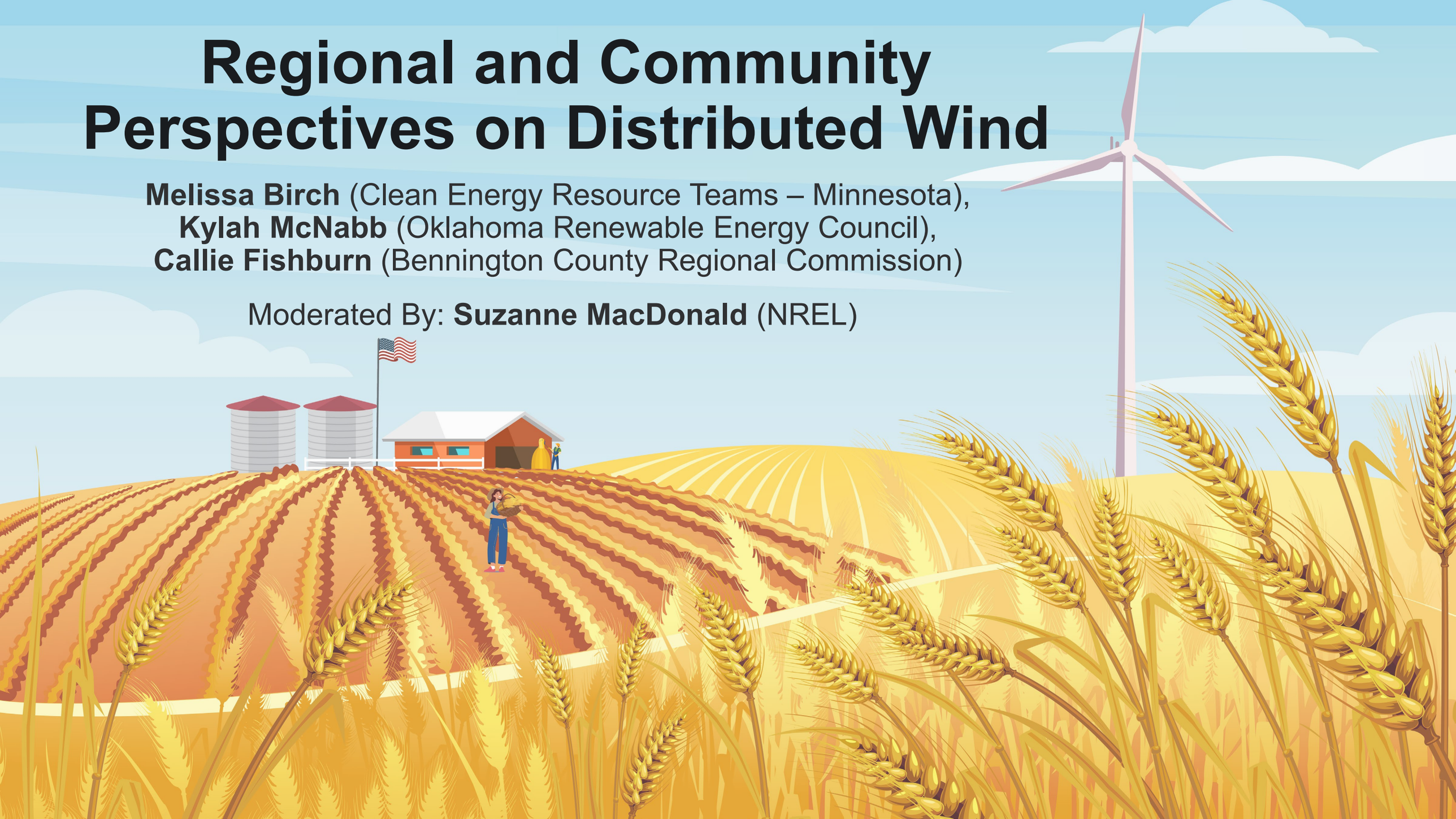
Moderated By: **Suzanne MacDonald** (NREL)



Distributed Wind in Minnesota: Challenges and Opportunities

CERTs
CLEAN ENERGY RESOURCE TEAMS

Melissa Birch

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Clean Energy Resource Teams

Mission

We connect individuals and communities to the resources they need to identify and implement community-based clean energy projects.

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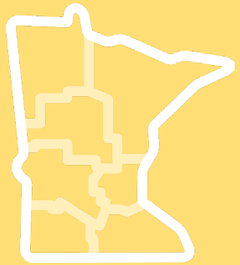
The CERTs Partnership

CERTs' Work

Across Minnesota



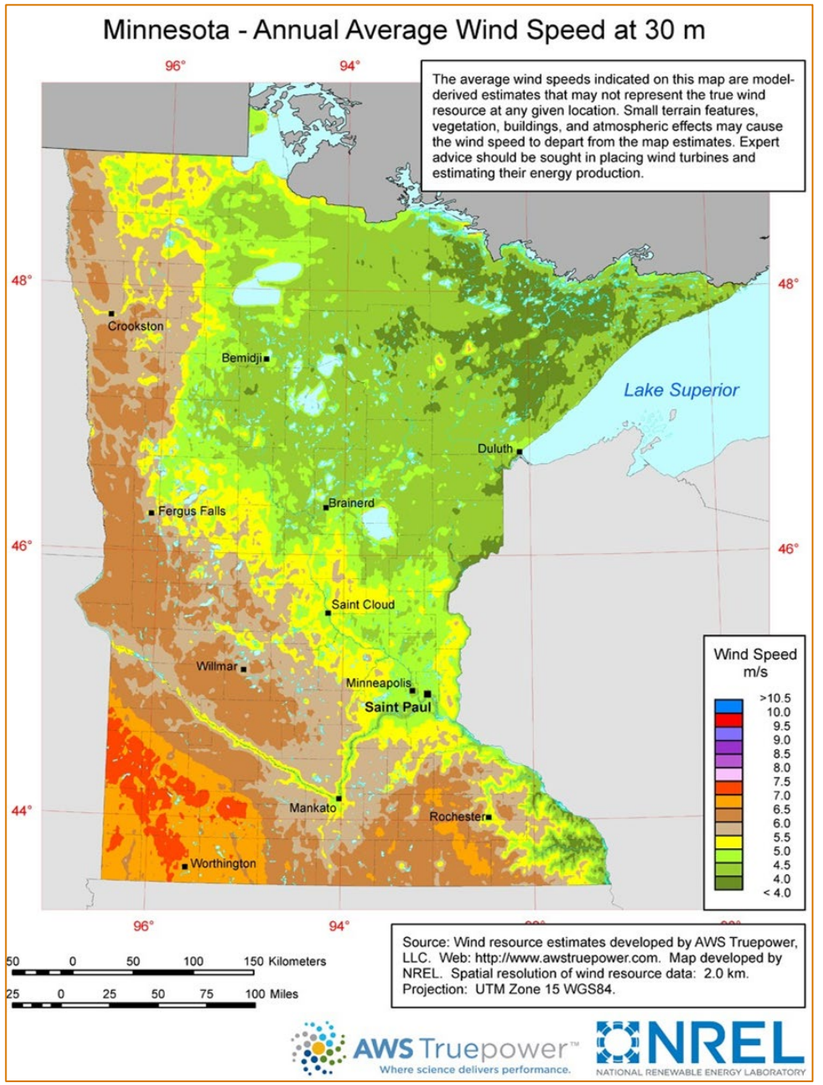
Unbiased technical assistance

Financial assistance

Cities & Counties
Tribal Nations
Utilities
Schools
Businesses
Nonprofits
Farmers
Residents
Underserved Communities

Wind Energy in Minnesota

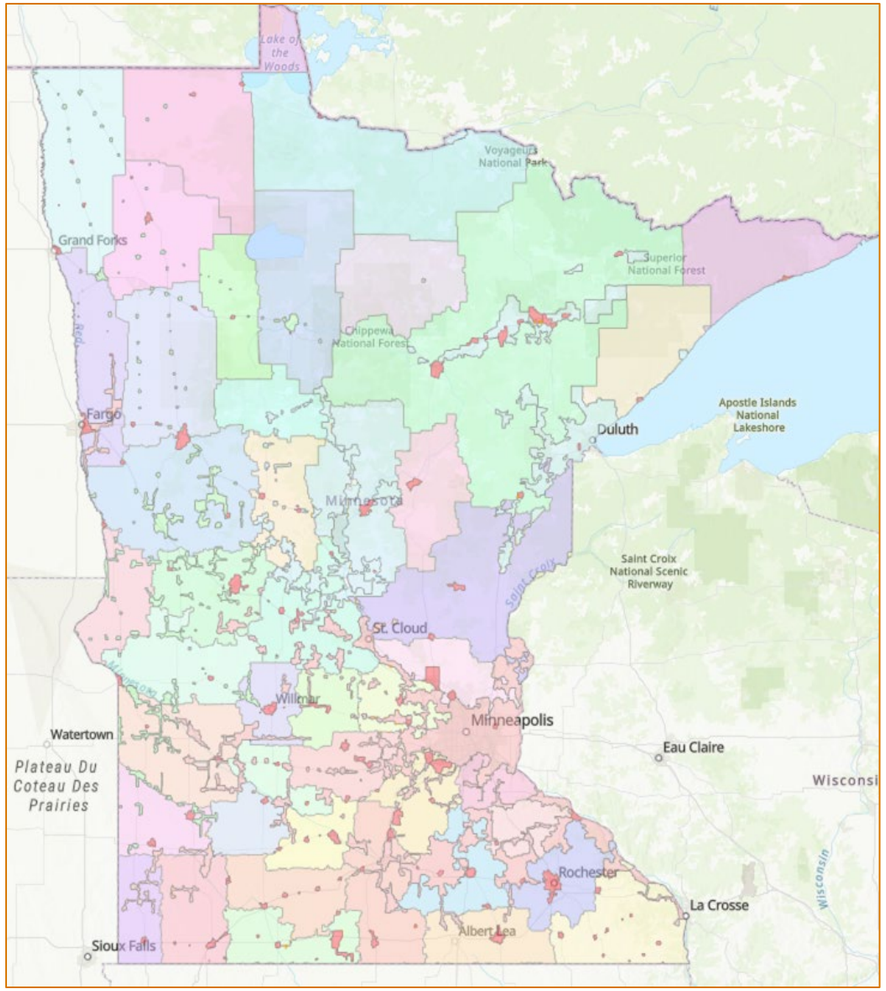
- **It's been around!**
- Good **wind resource** in southern and western areas of state
- **Utility-scale wind:** well-developed in Southwest Minnesota
- **Distributed wind:** sketchy reputation



Context: Project Implementation Level

- **Over 180 electric utilities**
  - Rural cooperatives
  - Municipal
  - Investor-owned
- **Net metering**
  - Average retail rate vs. avoided cost rates
  - 40kW or 120% of consumption
- **Minnesota funding options**
  - Property Assessed Clean Energy
  - MN Department of Agriculture grants

Electric Utilities in Minnesota



Lessons: Project Implementation Level

In Minnesota, distributed wind makes more sense than distributed solar… SOMETIMES

- Footprint
- Capacity factor
- Turbine & installation quality
- Access & commitment to regular maintenance

It may make sense to add batteries for:

- Load shifting to reduce demand charges
- Increasing resilience
- Systems larger than 40kW

Context: Energy System Level

- Rapidly **increasing demand**
- **Transmission** capacity limits
- Aging conventional **generation** fleet
- **100% carbon-free** by 2040

MISO: Load Forecasts (2024)

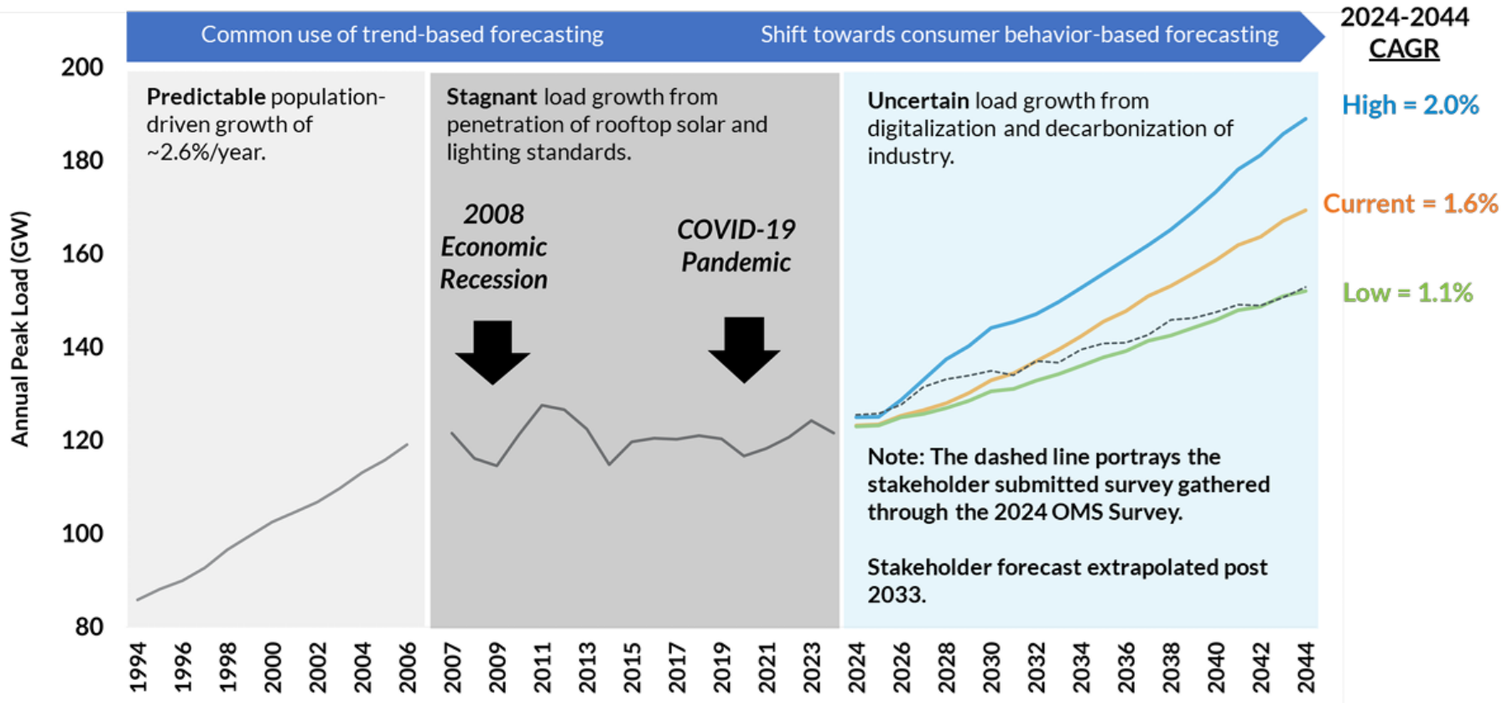


Image: https://cdn.misoenergy.org/

Context: Community Level

- **Siting** of utility-scale renewable energy development (concerns)
- **Production taxes** for counties and townships (economic development)
- **Energy reliability & affordability** (priorities)

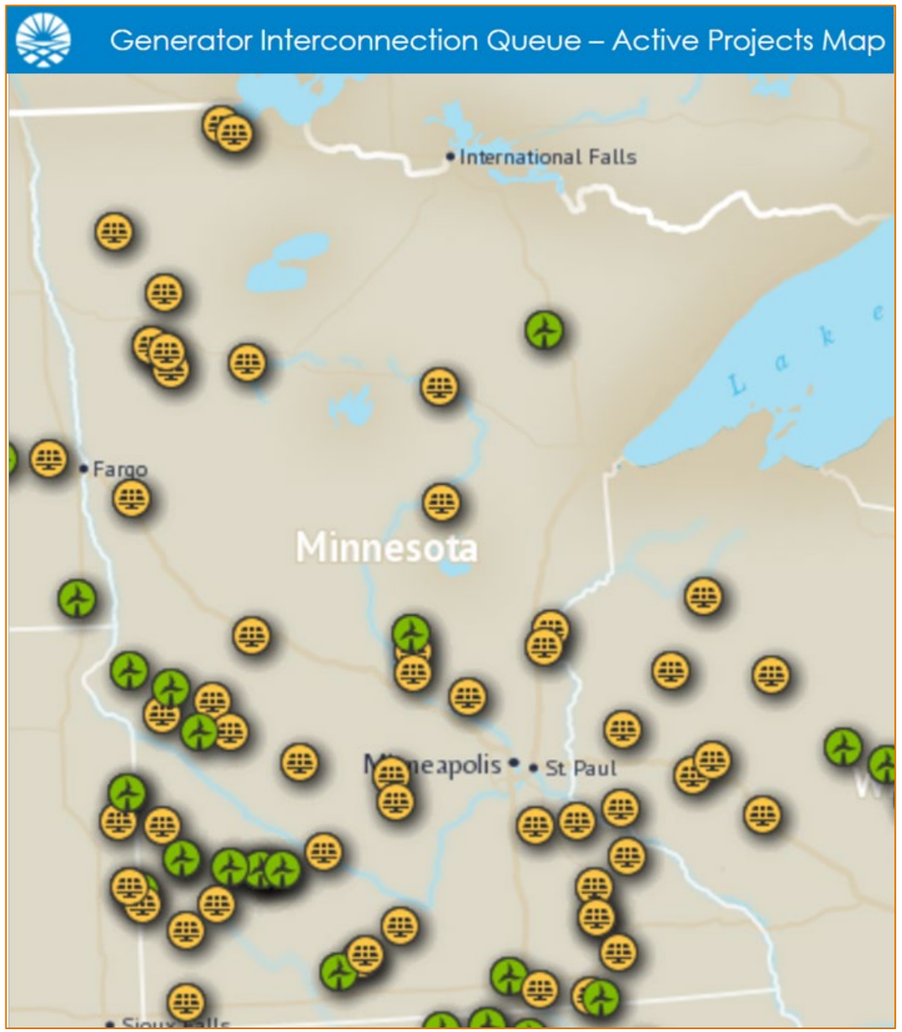
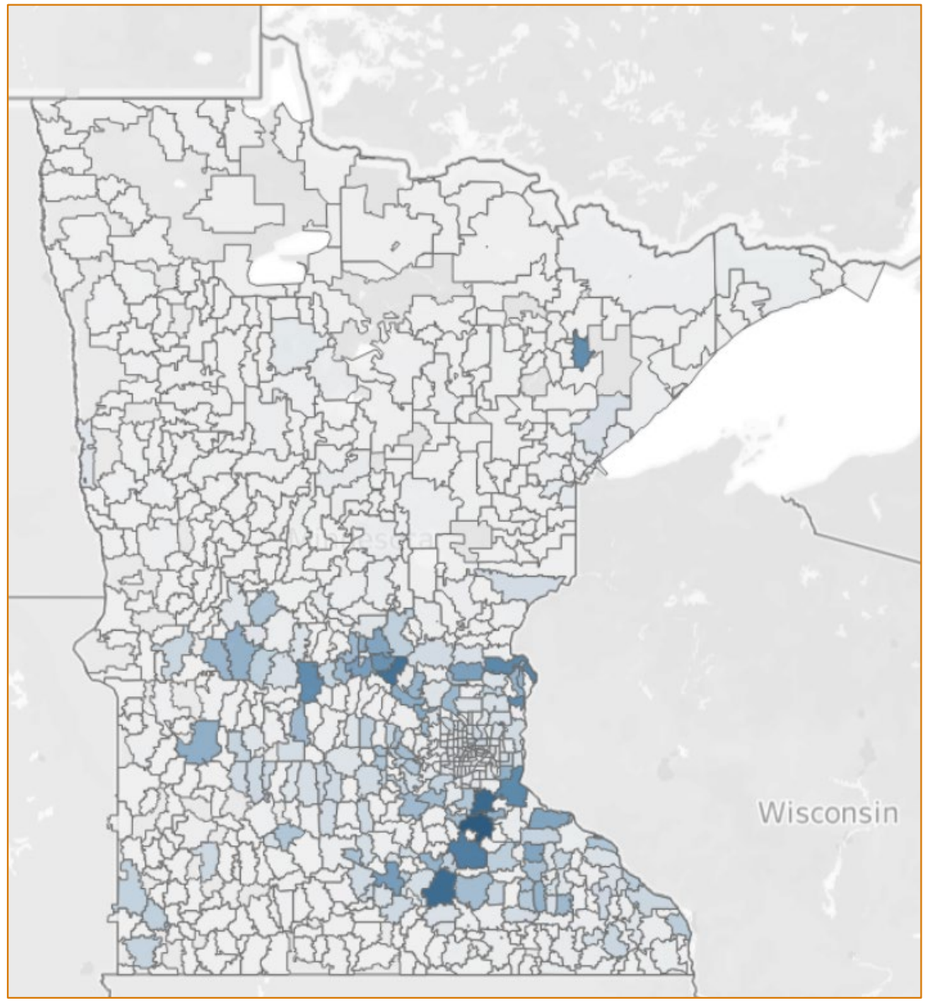
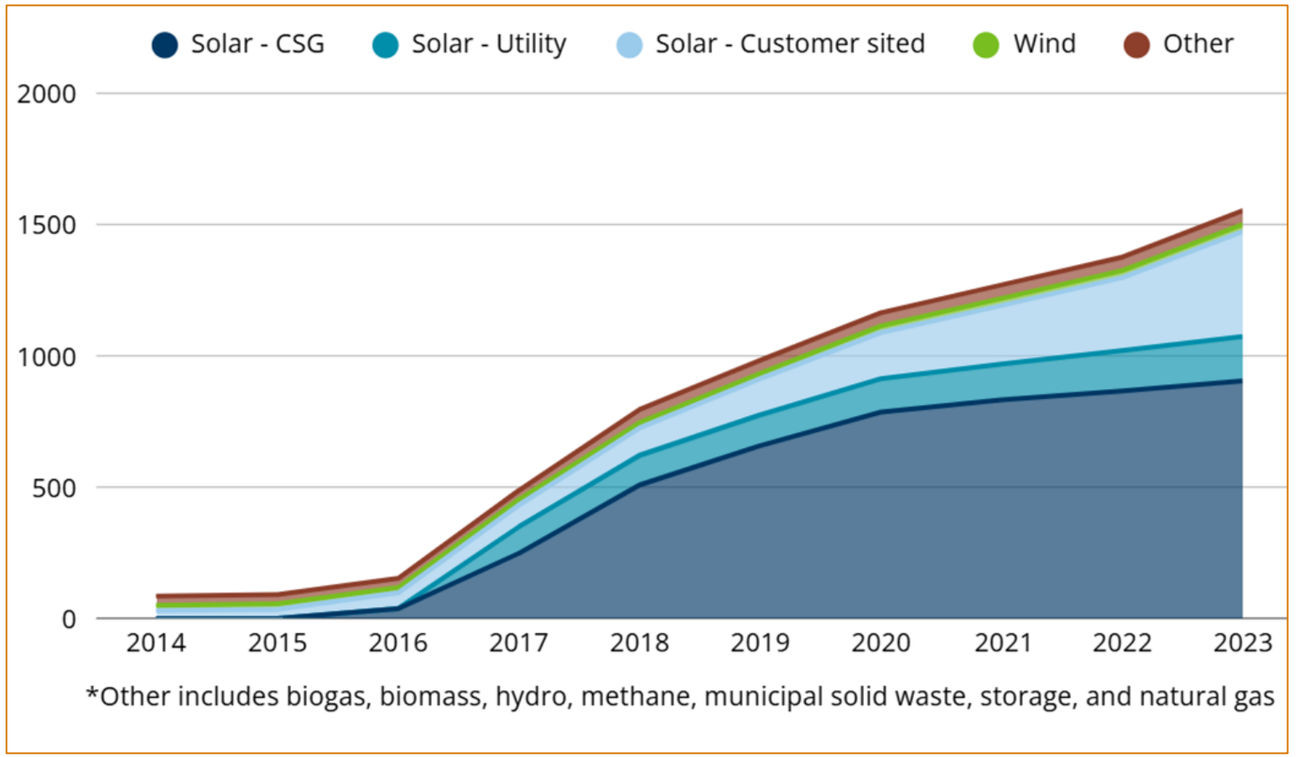


Image: https://giqueue.misoenergy.org/PublicGiQueueMap/index.html

Distributed Energy Resources in Minnesota



DER Capacity by Zip Code



Images: https://mn.gov/puc/activities/economic-analysis/distributed-energy/der-data-dashboard/

Lake Region Electric Cooperative's Wind Solar Hybrid Project

- 2.3MW wind turbine + 500kW solar array
- Developed by Juhl Energy Trondhjem Township in 2019
- Over $200,000 in annual savings on wholesale energy costs
- Paired with thermal storage: member-owned water heaters

Wind Solar Hybrid Project

U of MN West Central Research & Outreach Center's Renewable Hydrogen and Ammonia Pilot Plant

- 1.65 MW Vestas wind turbine in Morris, MN
- Anhydrous ammonia (NH3) produced through Haber-Bosch process
- Ammonia = fertilizer
- Ammonia = fuel
- Ammonia = hydrogen storage

Wind Turbine & Ammonia

Looking forward, where does distributed wind fit in Minnesota's energy system?

A Few Possibilities:

Behind-the-meter to reduce costs for farms, businesses, local and Tribal governments?

With batteries for resilience, load shifting, or even virtual power plants?

Front-of-the-meter as dispatchable power and ancillary services for the distribution utility?

Green ammonia / hydrogen?

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Distributed Wind in Oklahoma

September 23, 2025

Kylah McNabb
Oklahoma Renewable Energy Council

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OREC
Oklahoma Renewable Energy Council

EDUCATE

DEVELOP

GROW

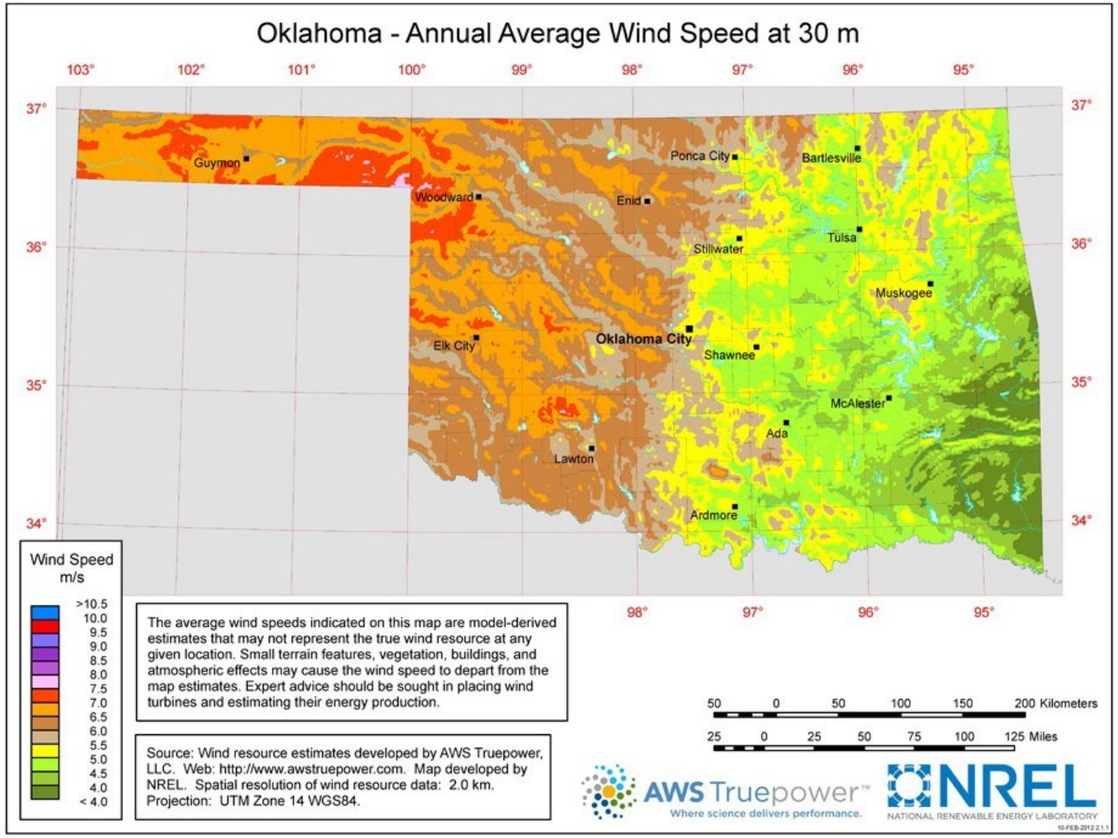
We believe Oklahoma needs to aggressively develop its renewable resources to spur economic development (particularly in rural areas), improve the environment, and preserve our state's position as a net electricity exporter. Oklahoma is blessed with abundant natural gas and renewable energy, and we believe these complimentary energy resources represent the future of a clean domestic energy supply. Renewable energy--with no fuel costs, very low operating costs, and unlimited supply—can help stabilize long-term energy prices—reducing the risk of price spikes.

Distributed Wind Trends in Oklahoma

- 40 projects totally 1.6 MW of installed capacity
- Behind-the-meter use for agricultural and rural small business is the most common application
- More than half of these projects have been installed since 2022
- Oklahoma has received more than $1.4 million in REAP awards since 2012

Why Oklahoma?

- Significant wind resources, particularly in western Oklahoma
- Large agricultural community which benefit from distributed energy technologies



Lessons Learned and Questions to Consider

- Cost is a key concern – the average cost to install, financing options, tax credits and other incentives?
  - The break even point in Oklahoma because of low electricity costs
  - Differences in electric cooperative net metering policies and rates
  - Many homes and buildings still use natural gas for at least their heat, which may reduce the financial benefit unless the home/building is shifted to full electric.
- Agricultural application is the context many stakeholders relate to – individual considerations and applications versus community/government currently
- See distributed wind as an opportunity for resiliency and self-sufficiency

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Thank you

Planning for Distributed Wind in Bennington County, VT

Callie Fishburn, Regional Planner
Bennington Country Regional Commission

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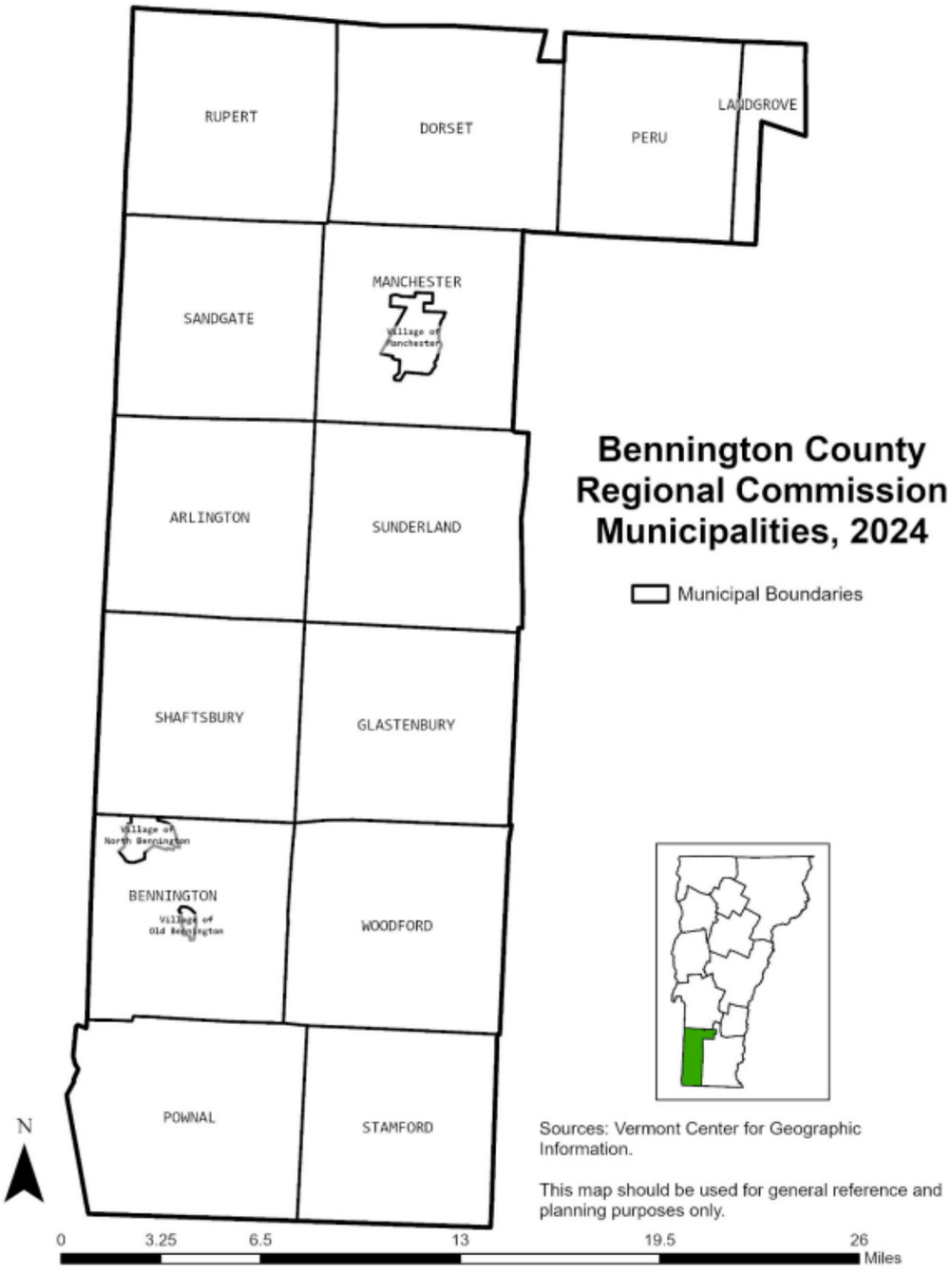
Background

BCRC

- One of 11 statewide regional planning commissions (RPCs)
- Work with 17 municipalities in Bennington County
  - ✓ SW corner of the state, bordered by NY and MA
- Regional population: ~35,000
  - ✓ Largest town: ~15,000
  - ✓ Smallest town: 7 (yes really!)
- Bennington County (and VT overall) is rural, and concerned with preserving scenic resources and viewsheds, making DW a promising solution.

Map 1-1. Municipalities of the Bennington Region.

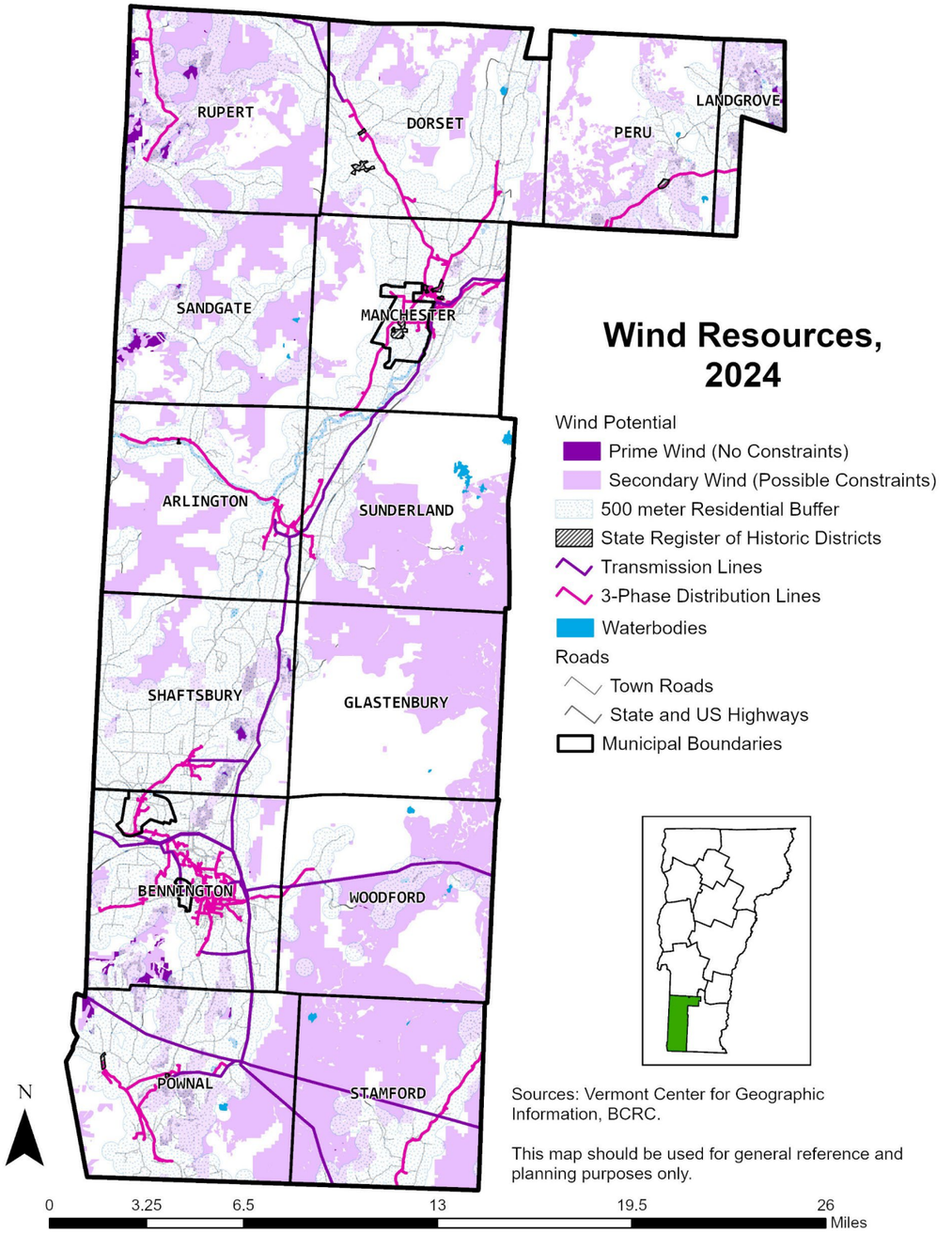


Renewable Energy Regulation in VT

- Renewable energy facilities in VT cannot be regulated by local zoning.
- VT Public Utility Commission has jurisdiction
- VT Act 174 (2016) allows municipalities and regions to have some control over the siting and standards of renewable energy facilities if they undergo an in-depth enhanced energy planning process.
- RPCs develop a regional energy plan which establishes renewable generation targets for 2025, 2035, 2050, and general siting guidance – must be approved by the VT Dept. of Public Service
- Municipalities can develop a municipal enhanced energy plan which identifies preferred sites, project characteristics, and screening standards – must be approved by the RPC.

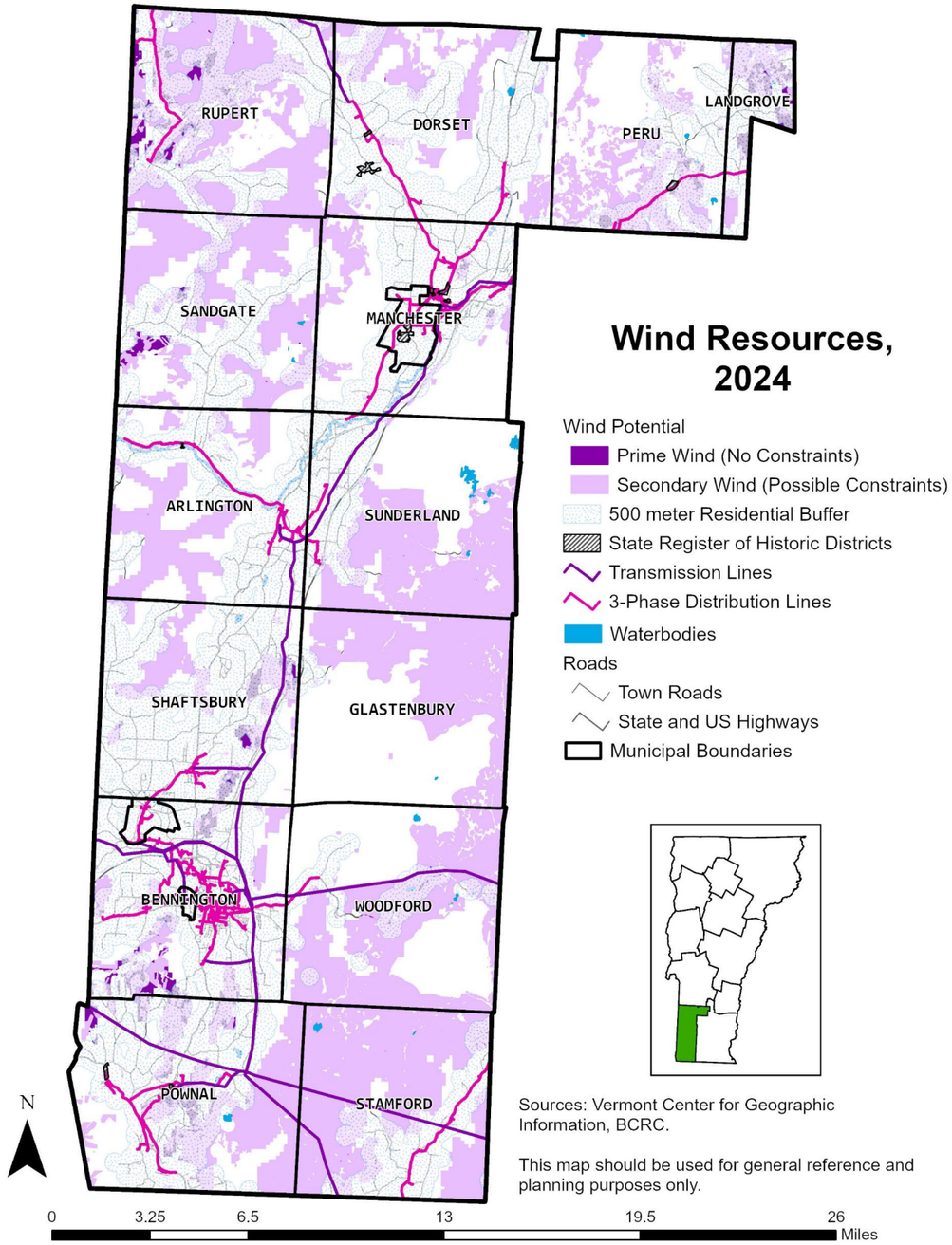
Distributed Wind in Bennington County

- Current regional goal: 12.6 MW of wind energy by 2050
- 2026 Regional Plan Update (underway now):
  - Promote DW through clear language and policies
  - Include definitions of different wind systems including DW
  - Change fixed setback recommendation to height multiplier – reduce barriers to DW
  - Distinguish the different sizes of wind systems and their relative impacts.



Community Concerns

- Local Stamford officials and residents were unhappy about two specific things in the current Regional Plan:
  - Southeast corner of Stamford being named as a preferred wind site – this area is considered a scenic ridgeline by the town.
  - 500m recommended residential setback – concerned that this is too close.
- Concerns seem to be about larger-scale wind
- Stamford's 2050 wind goal is 1.7MW – could be met with a mix of small wind energy systems, including DW



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Thank you!

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