

# Expanding Transmission Capacity: Options and Implications

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*What role does renewable energy play in driving transmission expansion?*

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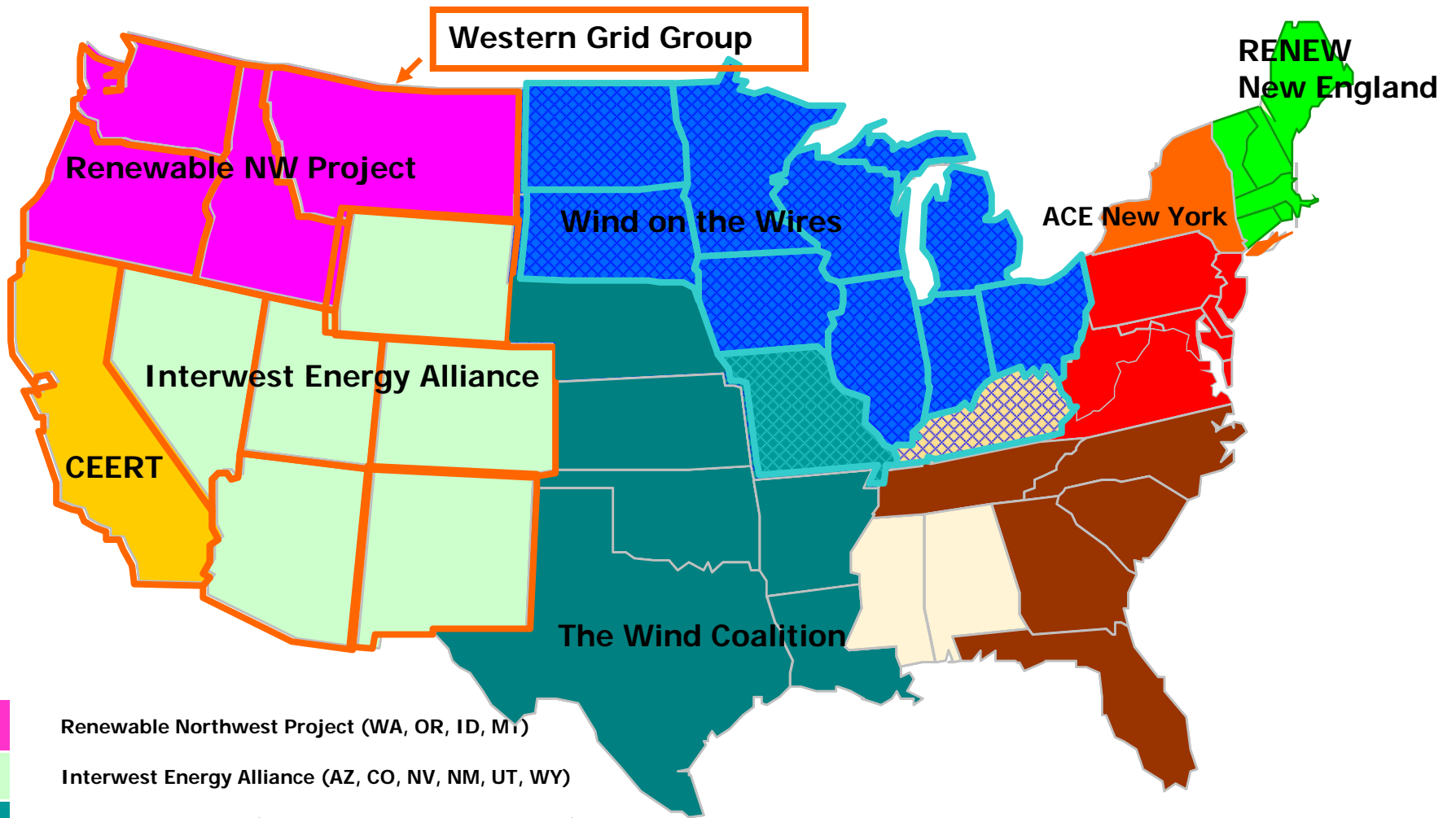


# Background on Wind on the Wires

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- **Organized** in 2001 to overcome the barriers to bringing wind power to market in the Midwest.
- **Members** include non-profit advocacy organizations, tribes, wind developers and manufacturers, American Wind Energy Association (wind industry trade association), businesses that provide goods and services to the wind industry.
- **Work in 3 areas:**
  - **Technical** – work with electric utilities and Midwest Independent System Operator (MISO – regional “grid” operator) on transmission planning for wind
  - **Regulatory** – involved in cases where states are approving new transmission lines that will advance wind power
  - **Policy education/outreach/advocacy** – speak to many people and groups about our work and issues
- **Support** – Foundations and member contributions.





- Renewable Northwest Project (WA, OR, ID, MT)
- Interwest Energy Alliance (AZ, CO, NV, NM, UT, WY)
- The Wind Coalition (NM, TX, OK, AR, LA, MS, KS, MO)
- Center for Energy Efficiency & Renewable Technologies (CA)
- Wind on the Wires (ND, SD, MI, MN, MO, IA, IN, WI, IL, OH)
- RENEW New England (CT, MA, ME, NH, RI, VT)
- Alliance for Clean Energy New York (NY)
- Potential New Mid-Atlantic Organization
- Potential New Southeastern Organization

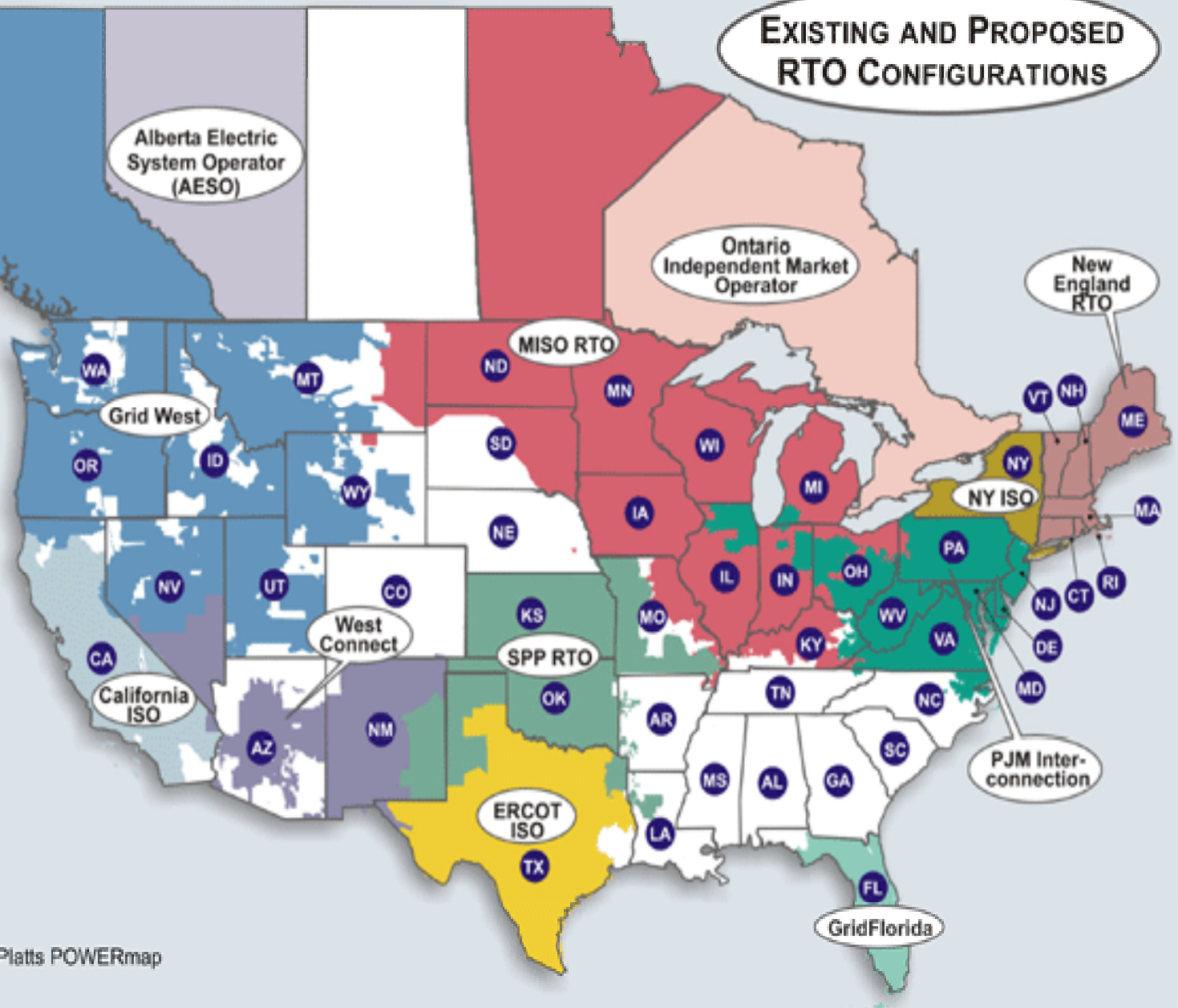


Western Grid Group (CA, OR, WA, MT, ID, AZ, NM, CO, UT, NV, WY)



Midwest Independent Trans. Sys. Operators (MISO) (ND, SD, NE, MN, IA, MO, WI, IL, MI, IN, OH, KY, Manitoba)

# EXISTING AND PROPOSED RTO CONFIGURATIONS



This map was created using Platts POWERmap  
January 18, 2006

## What's driving renewables and transmission expansion in the Midwest?

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- Climate policy debate – (federal, regional, state)
- State RES/promise of federal RES
- Debate on transmission policy – greater federal role?
- Need for new infrastructure for load growth, renewables, to reduce congestion
- Midwest Governors Association (MGA) Energy Security and Climate Stewardship Platform for the Midwest 2007
  - Aggressive renewables goals (30% by 2030)
  - Transmission Adequacy goals
- Upper Midwest Transmission Development Initiative
  - Governors of IA, MN, ND, SD, WI

# Transmission Studies

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- **State driven transmission study efforts**
  - Minnesota Renewable Energy Standard (MN RES) Transmission Studies
  - Michigan Wind Energy Transmission Study
- **Sub-regional group studies by utilities and the Midwest ISO**
  - CapX 2020 Initiative
  - American Transmission Company (Wisconsin)
  - Midwest ISO Regional Generator Outlet Study – Phase I and II
- **Multi-state transmission regulatory efforts**
  - Upper Midwest Transmission Development Initiative
  - Organization of Midwest ISO States
- **Midwest ISO footprint wide studies**
  - MISO Transmission Expansion Plan '08 and '09
- **Inter-regional studies**
  - Joint Coordinated Transmission Plan
  - Eastern Wind Integration and Wind Transmission Study

## Other Factors: Where Will the Wind be Located?

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	<u>MW Spinning</u>	<u>MW Under Construction</u>
Illinois (10 <sup>th</sup> in nation)	915	312
Indiana	531	305
Iowa	2,883	210
Michigan	129	---
Minnesota	1,804	---
Missouri	163	146
Nebraska	153	---
North Dakota	714	149
Ohio	7	---
South Dakota	238	50
Wisconsin	<u>449</u>	<u>---</u>
<b>Total Midwest</b>	<b>7,986</b>	<b>1,172</b>
Total United States	28,206	3,406

Source: <http://www.awea.org/projects/>

Information current as of March 31, 2009

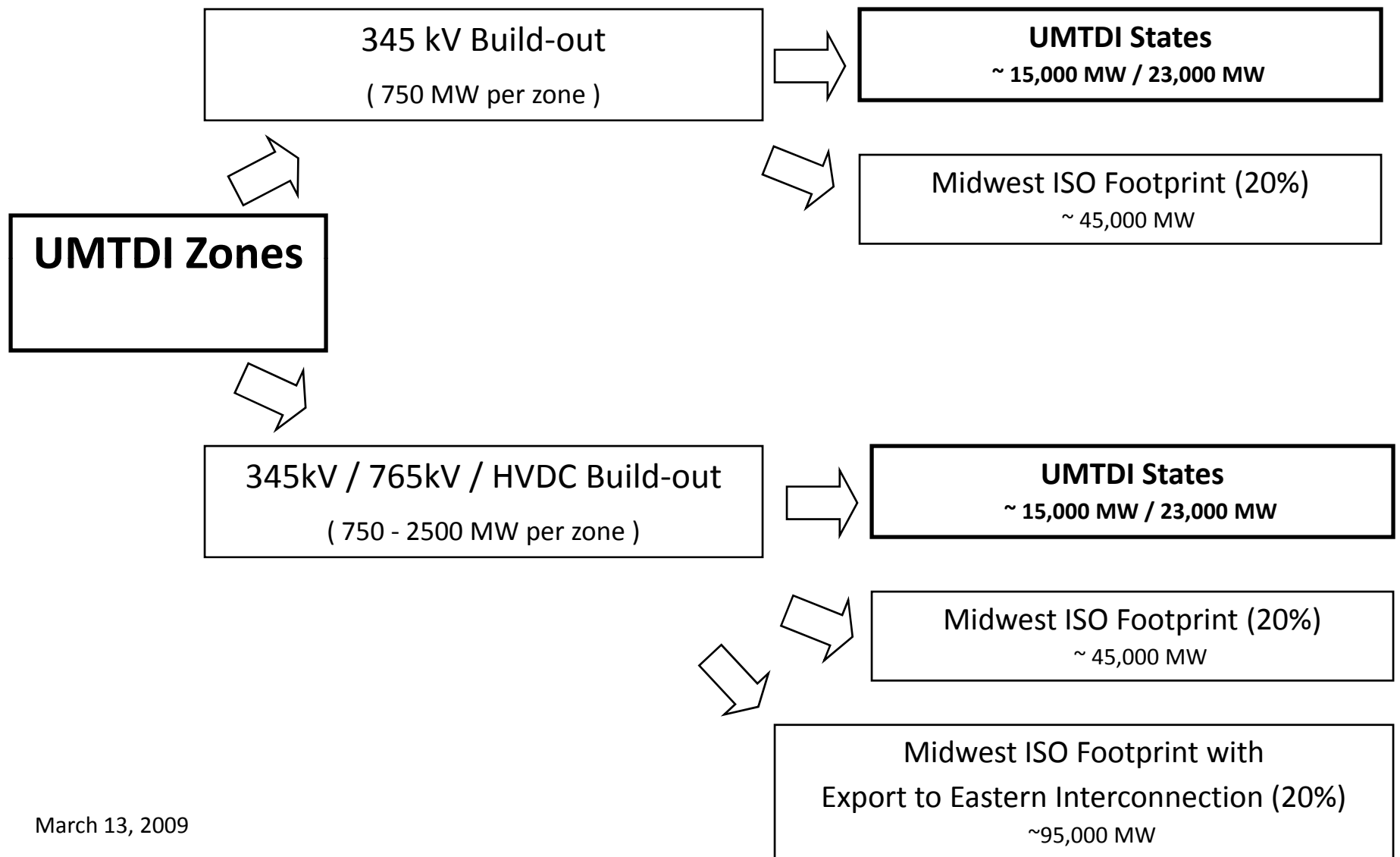
# The Vision for the Midwest??

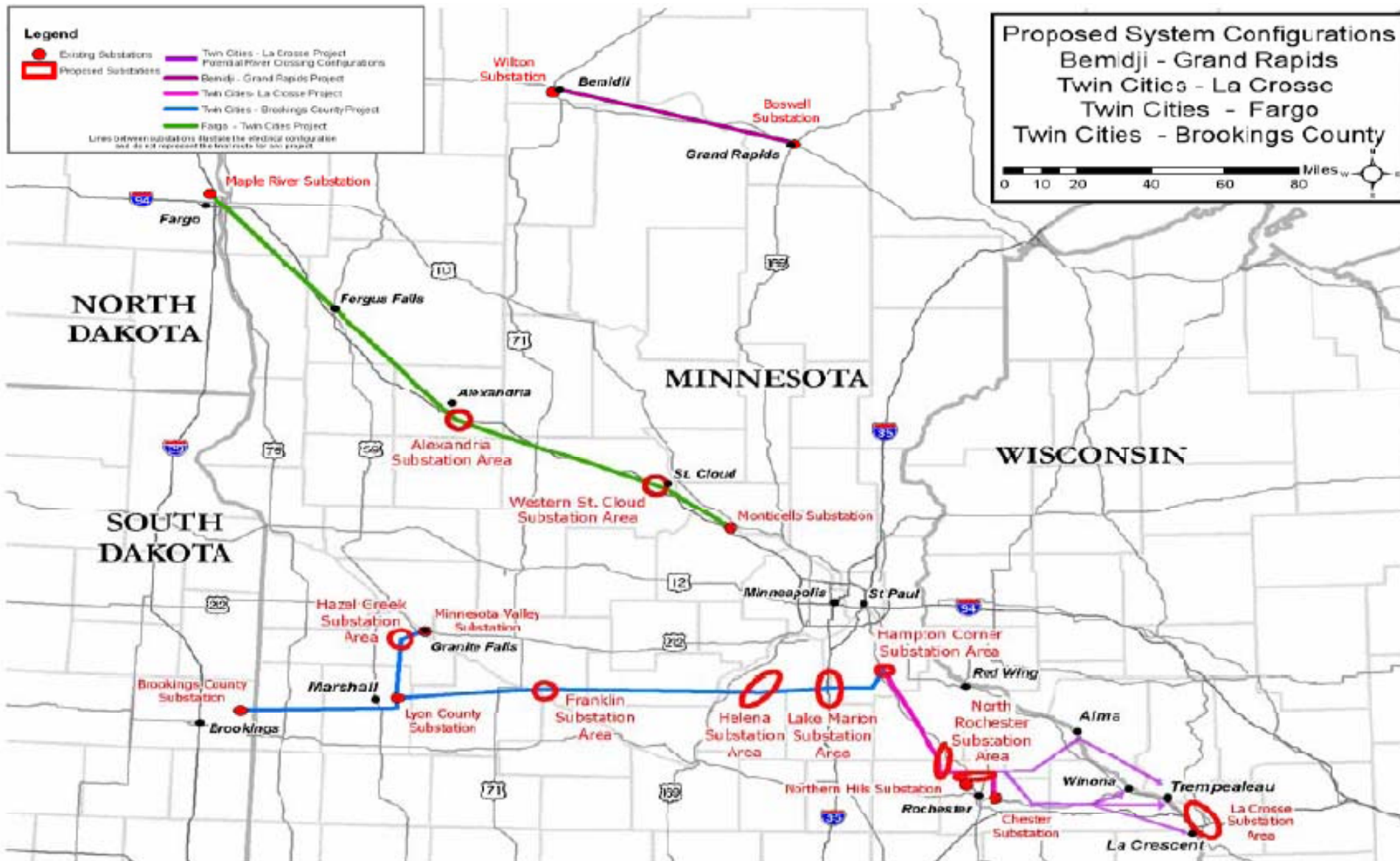
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	<u>Spinning</u>	<u>Under Construction</u>	<u>2020 VISION</u>	<u>2030 VISION</u>
Illinois	915	312	6,000	12,000
Indiana	531	305	4,000	8,000
Iowa	2,883	210	8,000	18,000
Michigan	129	---	6,000	12,000
Minnesota	1,804	---	5,000	10,000
Nebraska	153	---	2,000	8,000
North Dakota	714	149	4,000	6,000
Ohio	7	---	2,000	3,000
South Dakota	238	50	6,000	10,000
Wisconsin	<u>449</u>	<u>---</u>	<u>2,000</u>	<u>3,000</u>
<b>TOTAL</b>	<b>7,823</b>	<b>1,026</b>	<b>45,000</b>	<b>90,000</b>



# Transmission Study Scenarios





### CapX Group I Lines

Twin Cities – LaCrosse, WI: ~150 miles, 345 kV

Fargo, ND - Twin Cities: ~250 miles, 345 kV

Brookings, SD – Hampton Corners : ~200 miles, 345 kV

# How do we make progress on renewable energy goals?

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- Work in all timeframes – near, mid, and long-term
  - Renewable Energy projects must become commercially operational as we plan and build for mid- and long-term
- Continue to advocate at the state, regional, federal levels for policy changes
- Educate stakeholder groups – particularly environmental advocates – on the benefits of transmission as a climate change mitigation tool and economic driver
- Collaborate to build transmission to support renewables
- Continue to move the decimal point
- Tackle and decide cost allocation, siting issues
- Move transmission lines from the planning phase to approval and construction