



# Delivery of a Nebraska Commodity to the US Market.

Roads, Rails and Transmission

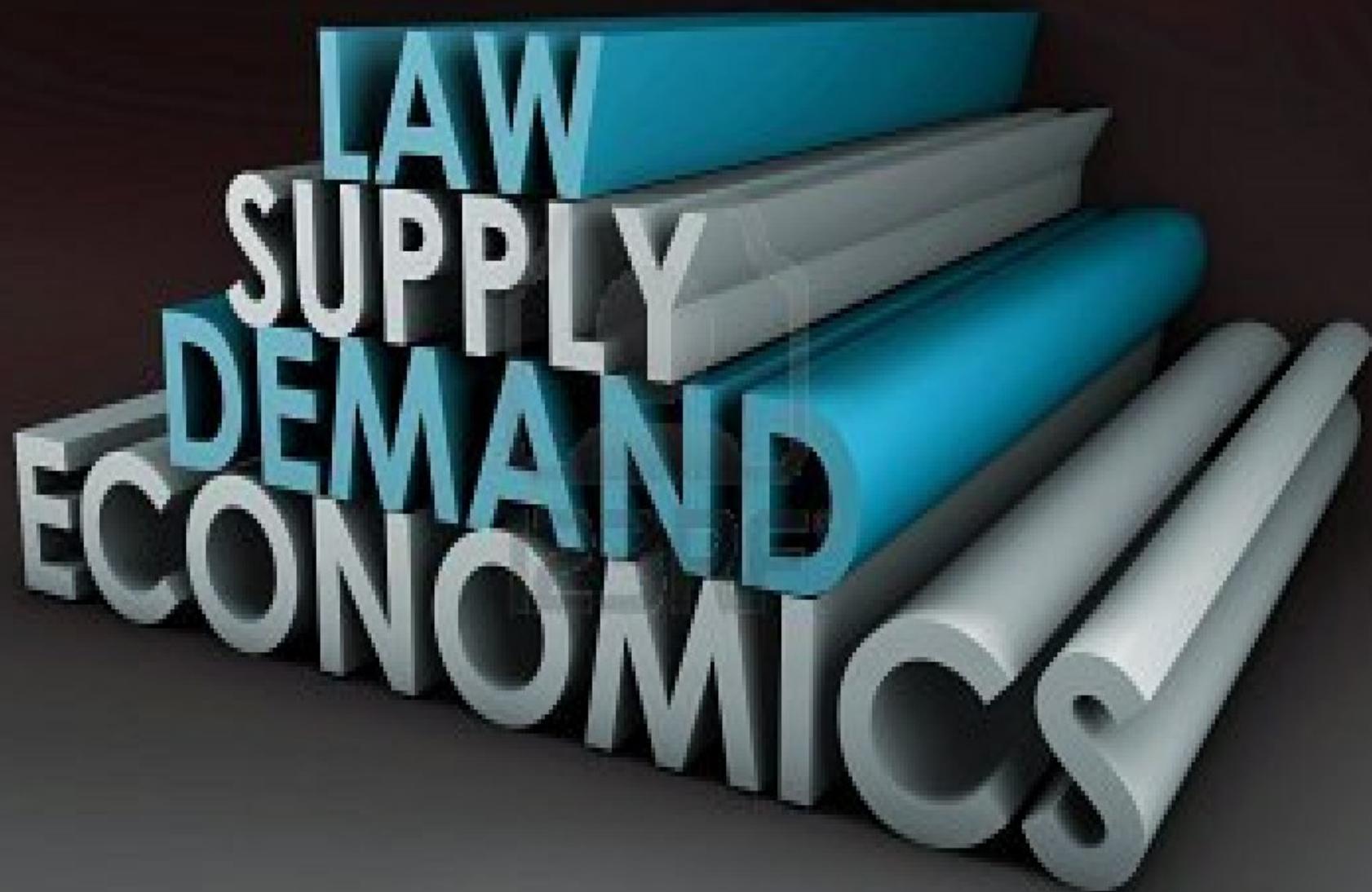
Steve Gaw

The Wind Coalition



# The Wind Coalition

- Acciona; Apex Wind; ENEL; EnXco(EDF-R);
- Infinity Wind; Pattern Energy; TradeWind Energy;
- AES Wind; Blattner Energy (D.H. Blattner); BP;
- Clean Line Energy; Clipper; CPV; Duke;
- E.On (Airtricity); Edison Mission;
- EDPR (Horizon); Exelon; Gamesa; GE Wind Energy;
- Iberdrola (PPM); Invenergy; Novus (Great Plains)
- RES (Renewable Energy Systems); Third Planet;
- Vestas; Zephyr Wind Power (MAP Royalty);
- Stahl, Bernal & Davies LLP; Electric Power Engineers;
- TREIA; Environmental Defense Fund; AWEA; Public Citizen.



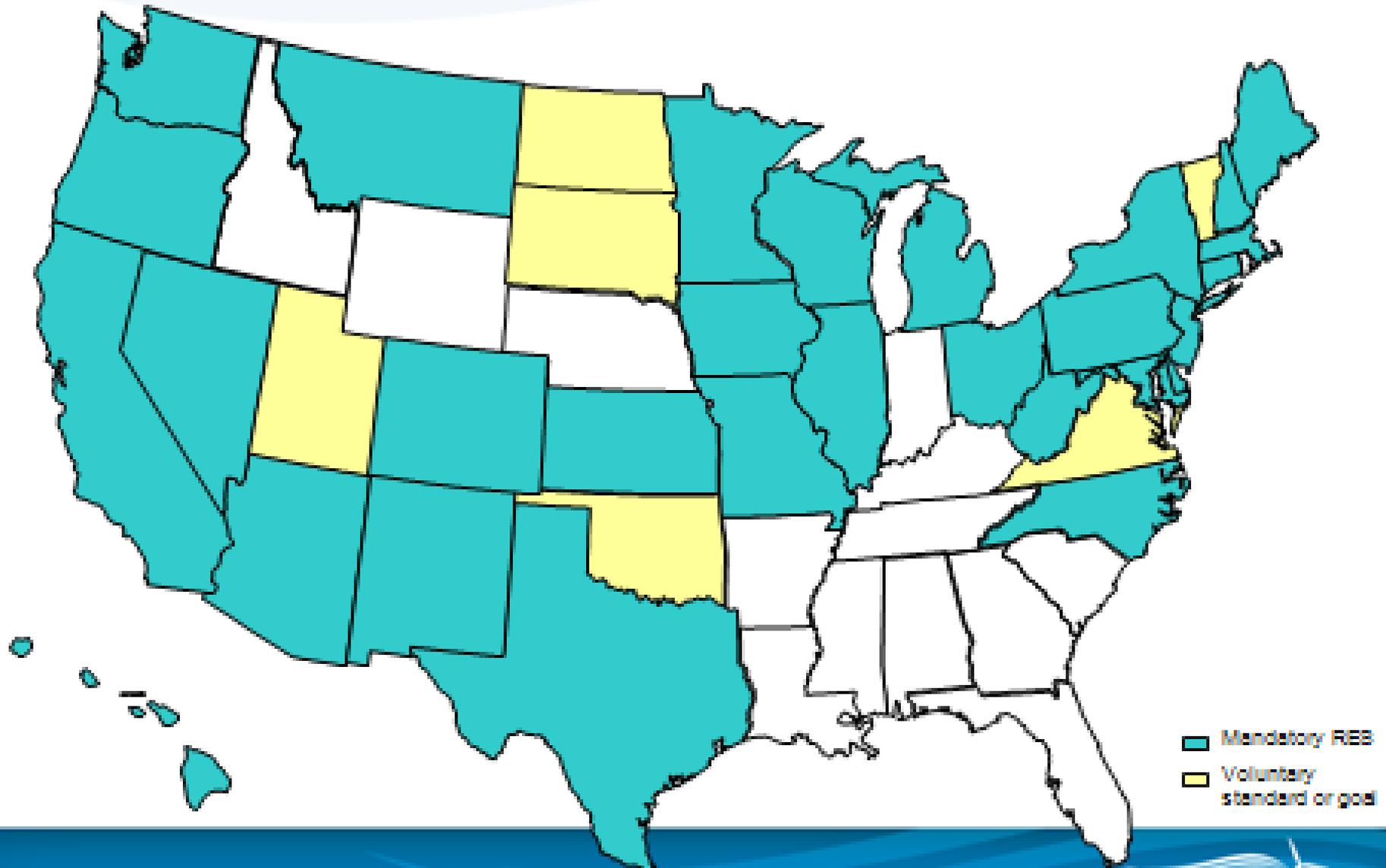
A 3D graphic featuring the words "LAW", "SUPPLY", "DEMAND", and "ECONOMIC" stacked vertically. The letters are rendered in a light blue color with a white outline, giving them a three-dimensional appearance. The text is set against a dark, gradient background. The words are arranged in a slightly staggered, overlapping manner, with "LAW" at the top, followed by "SUPPLY", "DEMAND", and "ECONOMIC" at the bottom. The overall composition is clean and modern, emphasizing the intersection of law and economics.

LAW  
SUPPLY  
DEMAND  
ECONOMIC

# Demand



# Majority of States Have Established Long-Term Renewable Electricity Standards



■ Mandatory RES  
■ Voluntary standard or goal



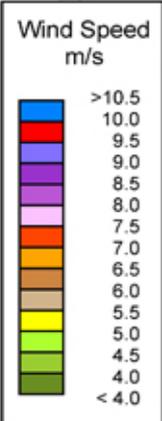
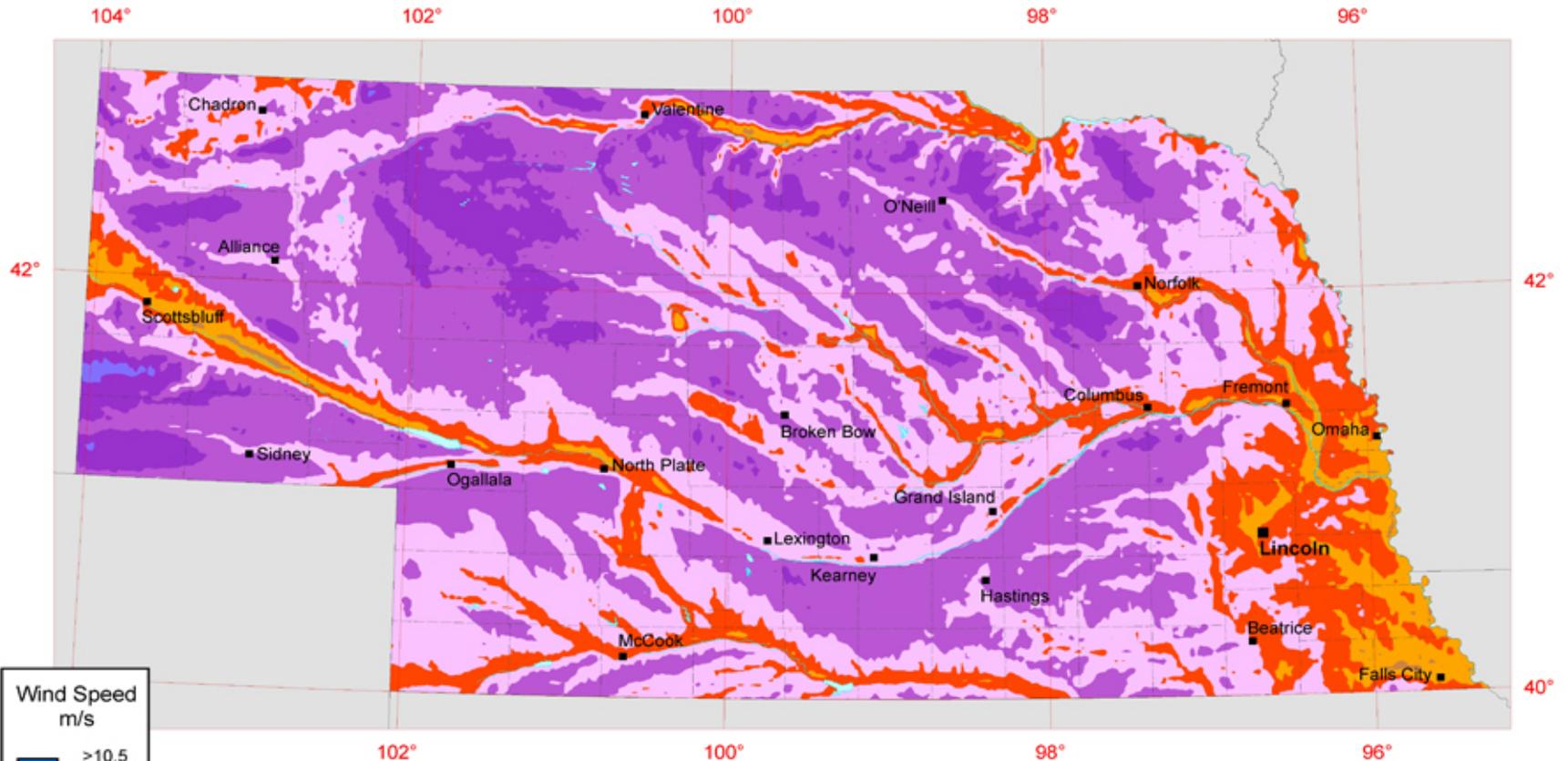
# Additional Demand

- Hedging Uncertainty
  - Fuel Prices
  - Fuel Transportation Cost
  - Diversity
- Environmental Issues
  - Cross State Air Pollution Rule
  - Mercury and Air Toxics Standards
  - Water Use

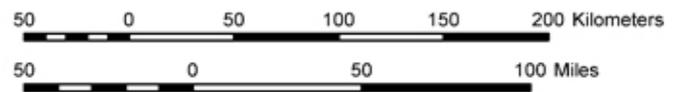
# Supply



# Nebraska - Annual Average Wind Speed at 80 m



Source: Wind resource estimates developed by AWS Truepower, LLC for windNavigator®. Web: <http://www.windnavigator.com> | <http://www.awstruepower.com>. Spatial resolution of wind resource data: 2.5 km. Projection: UTM Zone 14 WGS84.



# Wind Status in Nebraska

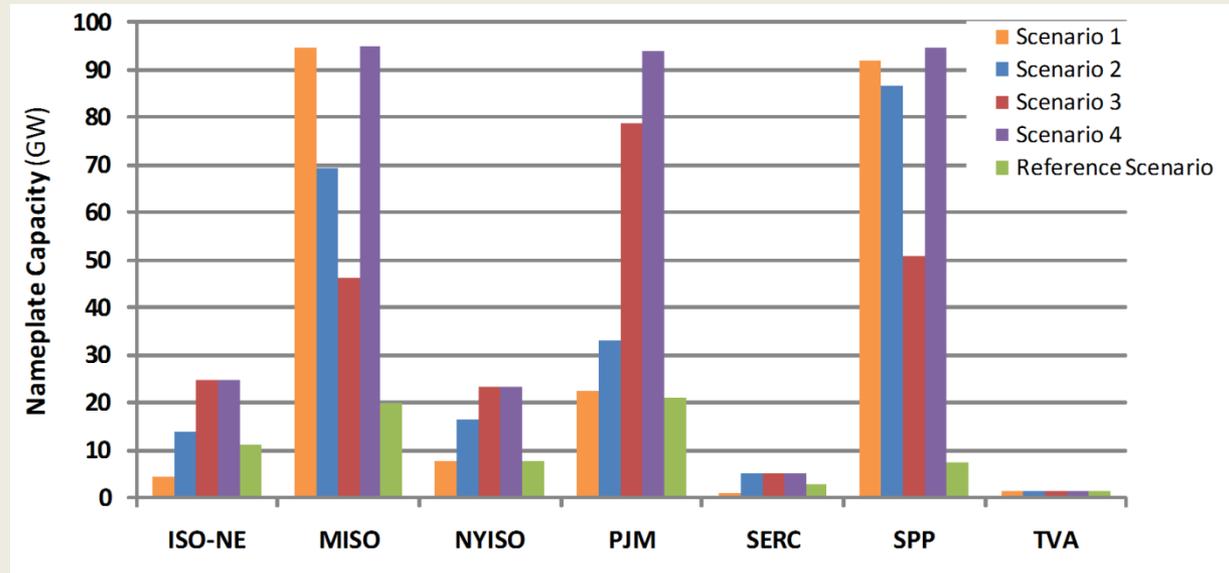
- Currently online: 457 megawatts (MW)
- Added in 2012: 120 MW
- Added in 2011: 125 MW
- Added in 2010: 60 MW

# Nebraska Wind Resources

- State potential wind resource:
  - Capacity: 917,998.7 MW
  - Energy: 3,540,370 GWh annually at 80 meters hub heights (NREL/AWS Truepower Study)
- Nebraska's wind resource is ranked **3rd** in the US.
- According to a resource assessment from the National Renewable Energy Lab, Nebraska's wind resource could provide over a hundred times the state's current electricity needs.

# Regional Wind Penetration by Scenario

- Very high penetrations in SPP and MISO for all scenarios
- Atlantic off-shore amount increases substantially in S3 & S4.
- Installed wind generation capacity
  - 20%  $\approx$  230 GW
  - 30%  $\approx$  330 GW



## Capacity Factor Comparisons:

### Scenarios

	East	West
Scenario 1	33%	40%
Scenario 2	34%	40%
Scenario 3	36%	39%
Scenario 4	36%	40%

### Entire Database

	Land Only	W/offshore
West	38%	
East	31%	36%
East + PJM	30%	36%

West = MISO + SPP  
 East = ISO-NE + NYISO

# Obstacles to wind development in Nebraska



# Challenges for Nebraska Wind Development

- Risk for private development
- Demand for homegrown renewable energy in Nebraska
- Tax issues
- Transmission

Through the efforts of a few working together...



Other challenges await...



# Transportation is critical to market success



# Roads to Market: Transmission



# Transmission Barriers

- **COST ALLOCATION**

- No mechanism for dividing costs up fairly among those who benefit
- No cost allocation for economic or policy driven projects

- **PLANNING**

- Planning was piecemeal and inefficient
- Good projects were not being built

# Highways and Markets



# Building Transmission



TRANSMISSION CHALLENGES

**THE SPP SOLUTION**

# INTEGRATED TRANSMISSION PLANNING



# Highway/Byway Cost Allocation

<b>Voltage</b>	<b>Paid for by Region</b>	<b>Paid for by Local Zone</b>
300 kV and above	100%	0%
above 100 kV and below 300 kV	33%	67%
100 kV and below	0%	100%

# SPP: After Passage of ITP and Highway/Byway

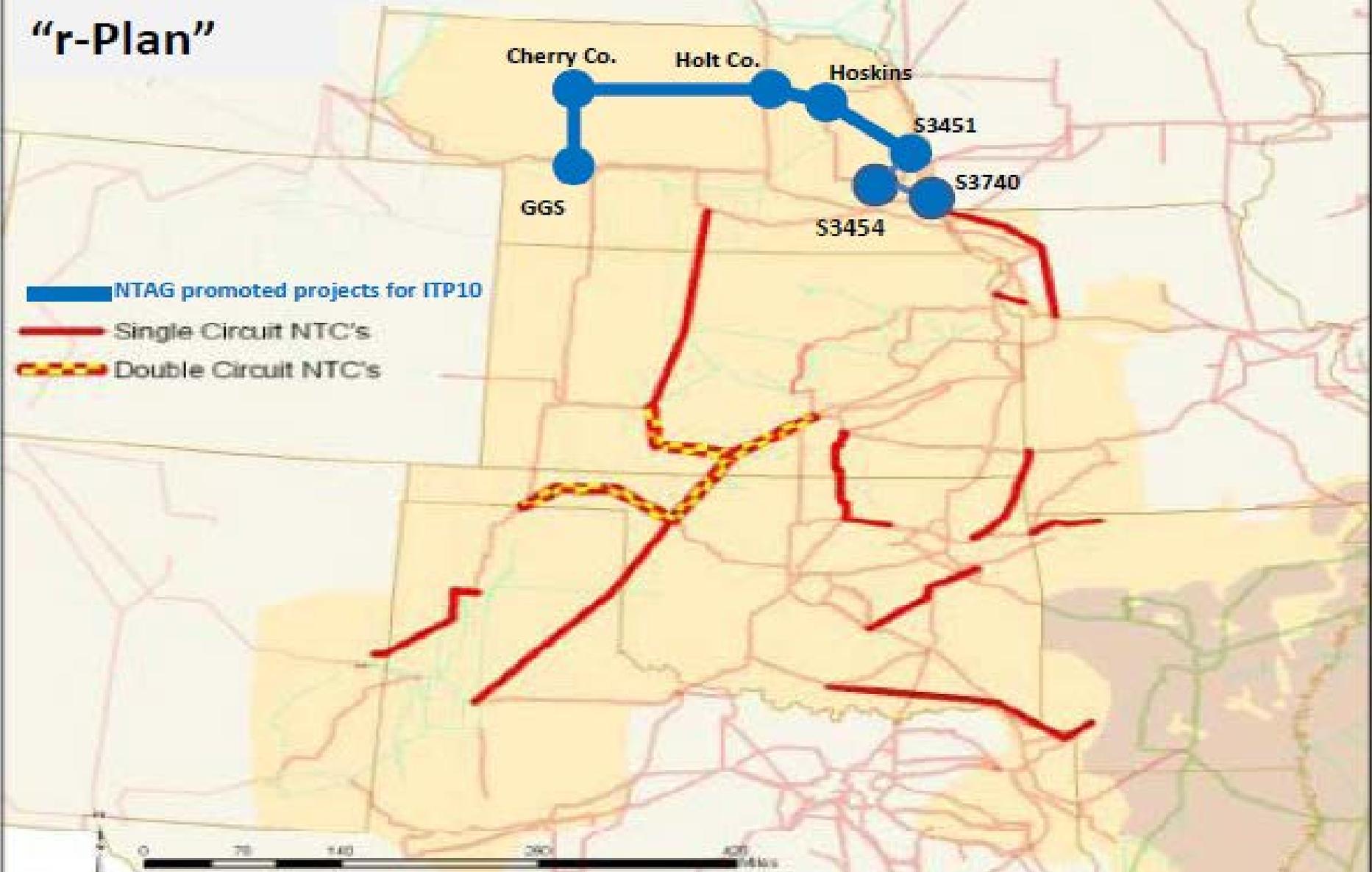
- \$7 Billion in new notices to construct transmission have been issued
- New market startup in 2014
- New Wind Resources are being modeled in every future within the Integrated Transmission Planning process

SPP

# **NEBRASKA TRANSMISSION NEEDS**

# NTAG EHV Overlay

## "r-Plan"



# Nebraska Transmission Advocacy Group (NTAG)





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## SPP 2012 ITP10 Year Plan

Completed January 2012

All SPP Transmission Expansion Plans are subject to change.

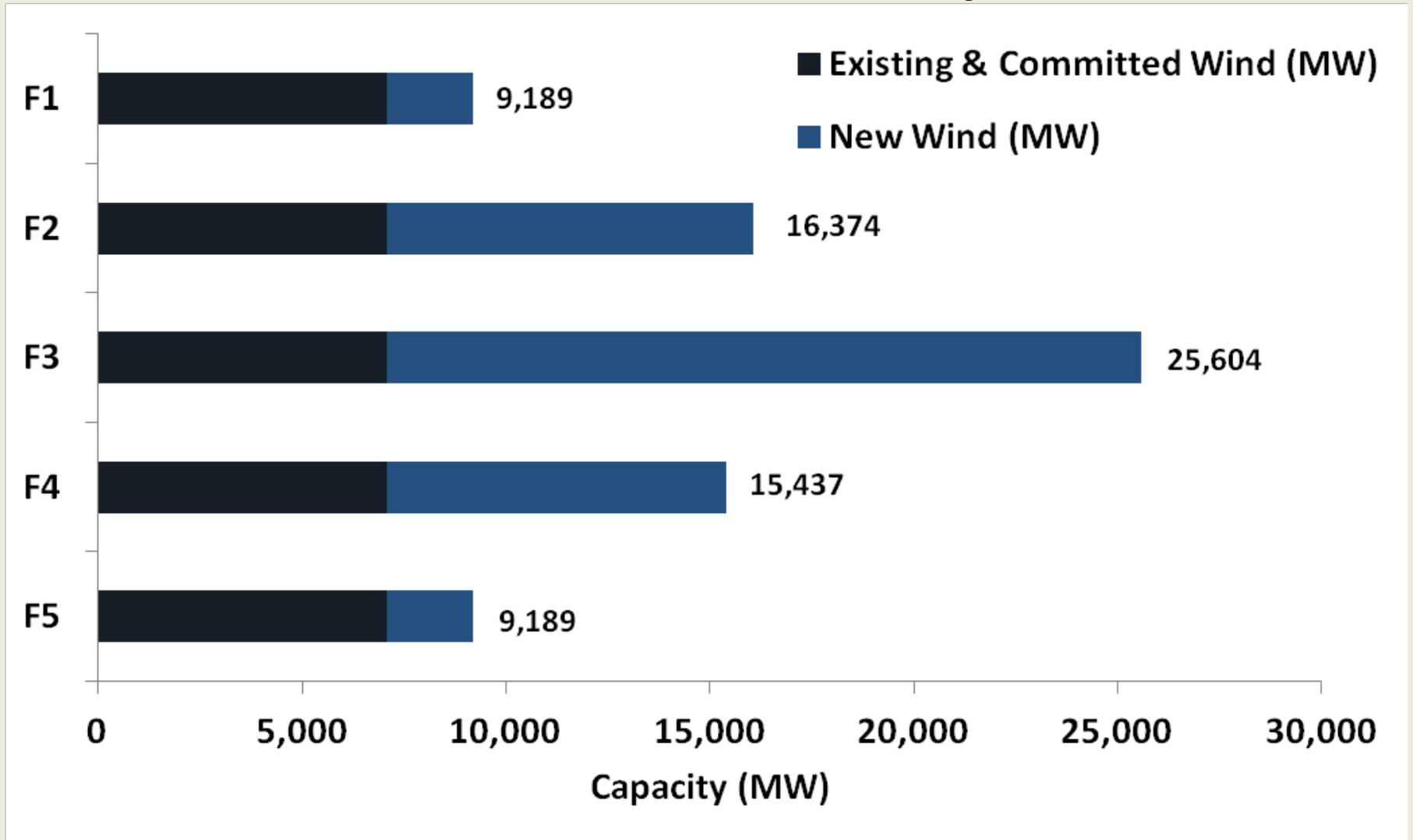
### Upgrade Type

- Rebuild/Reconductor
- New Line

### Design Voltage

- 115 kV
- 161 kV
- 230 kV
- 345 kV
- 500 kV

# Wind Summary



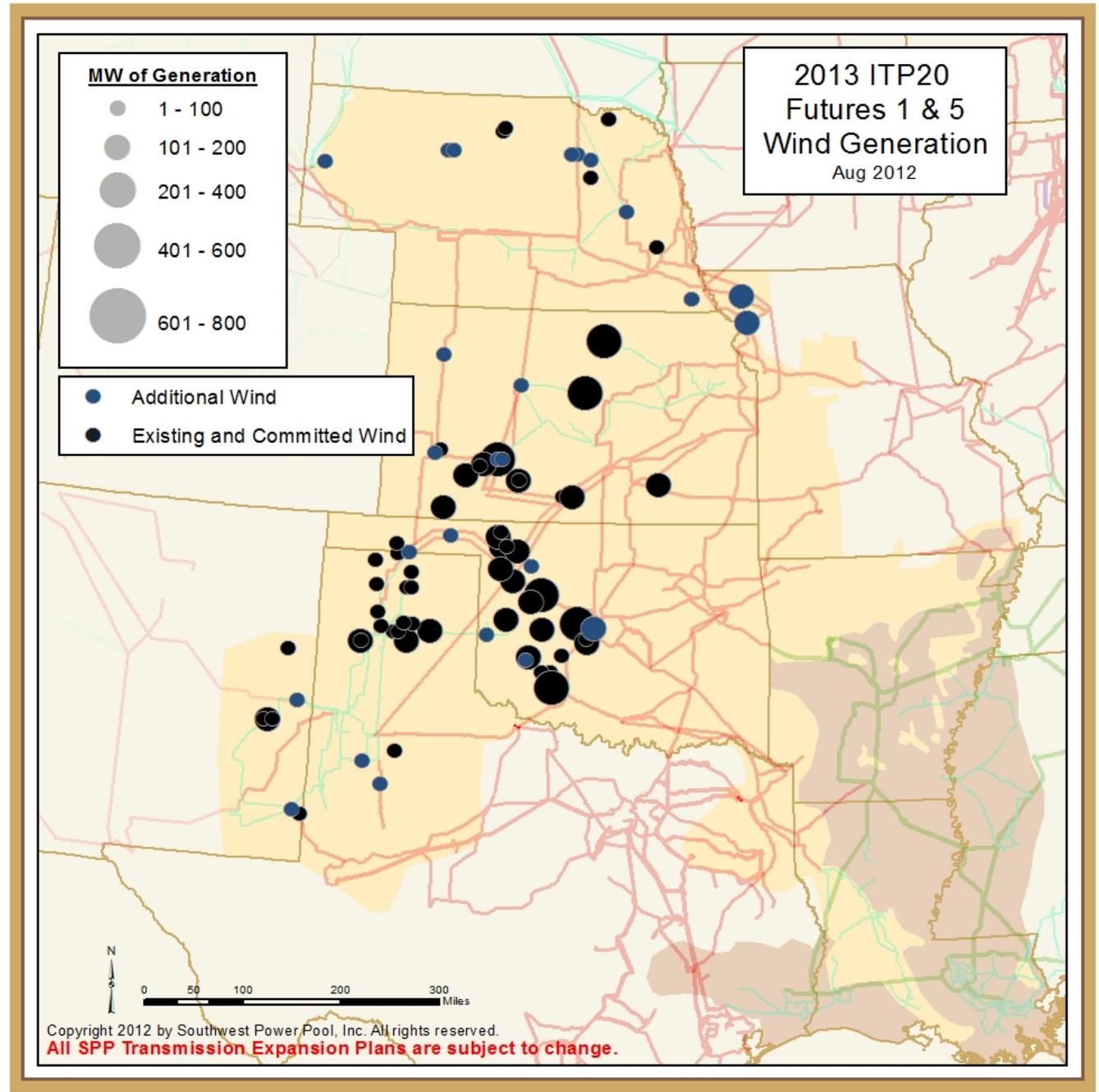
2033

Wind Sites

71 existing  
25 new

Wind Capacity (GW)

7.1 existing/committed  
2.1 new  
9.2 total



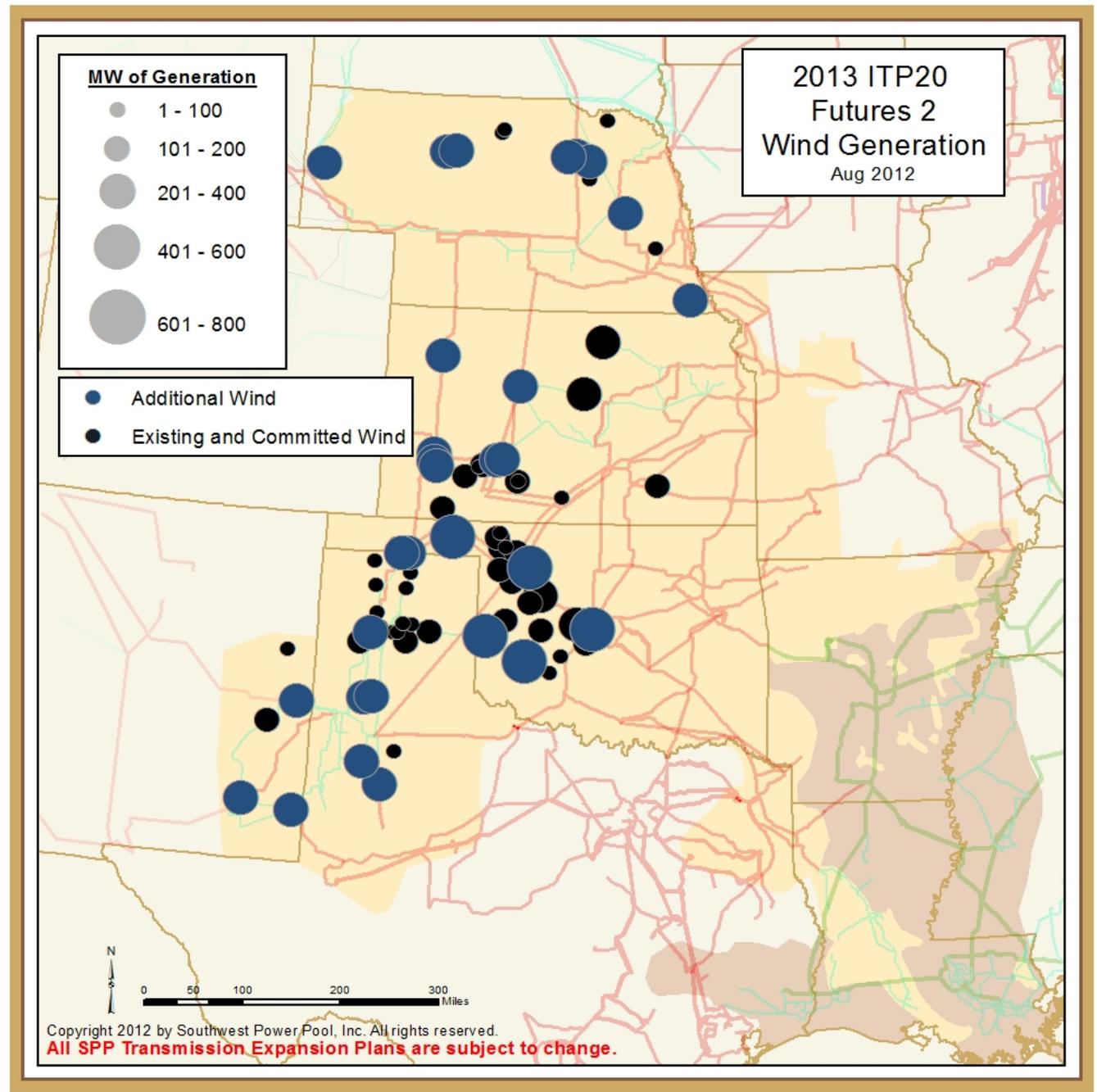
2033

Wind Sites

71 existing  
30 new

Wind Capacity (GW)

7.1 existing/committed  
9.0 new  
16.1 total



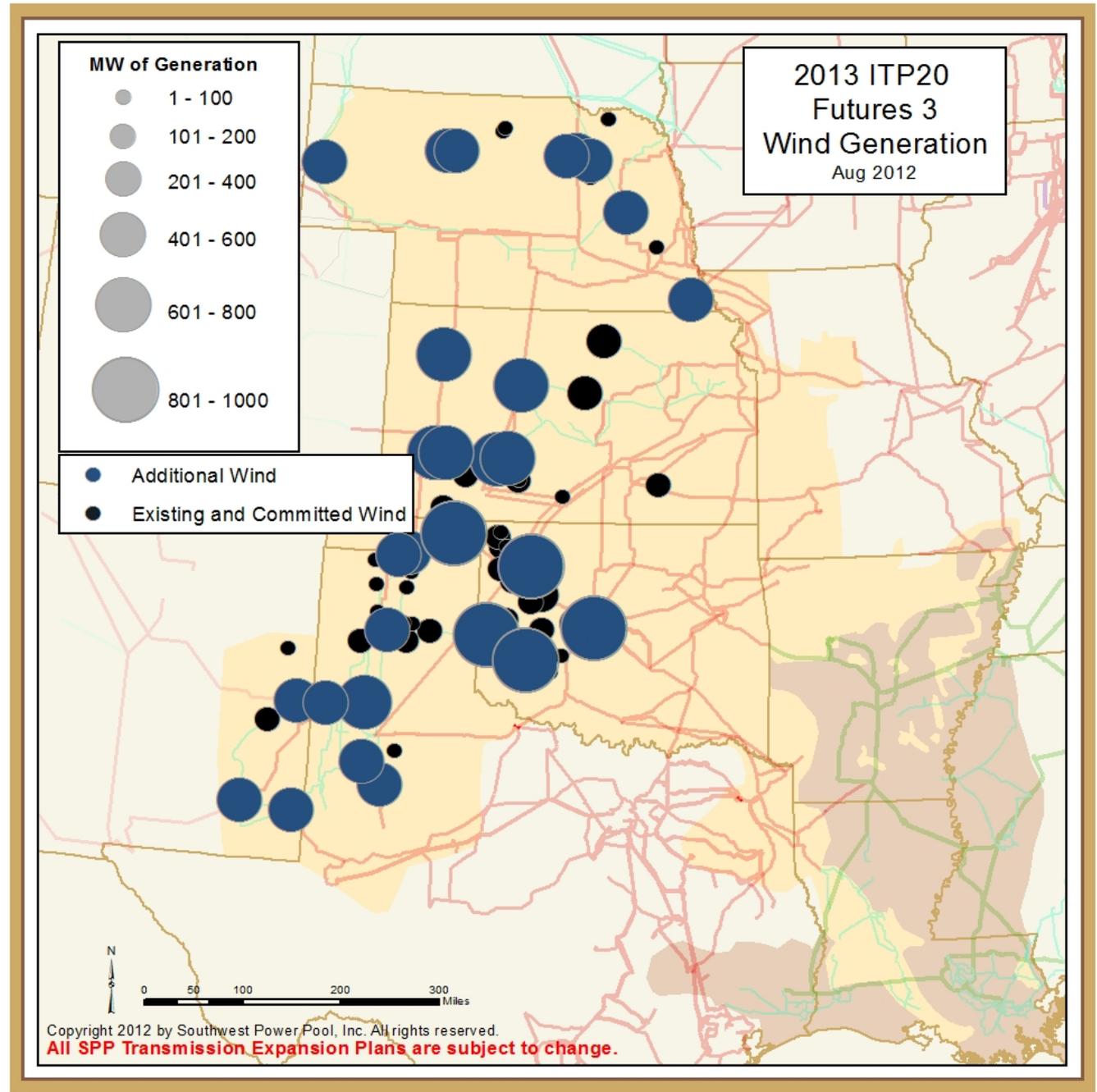
2033

Wind Sites

71 existing  
30 new

Wind Capacity (GW)

7.1 existing/committed  
18.5 new  
25.1 total



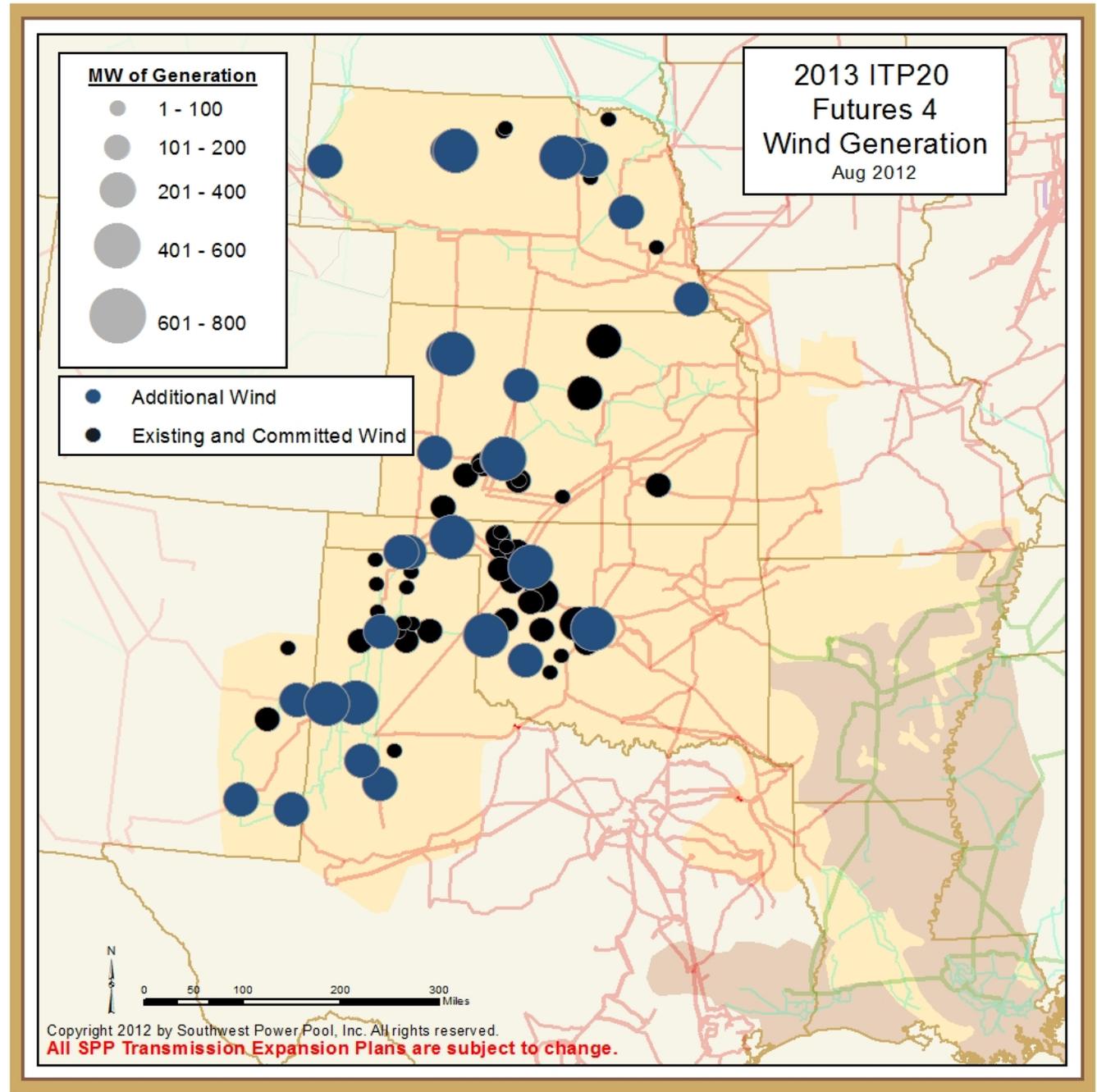
2033

Wind Sites

71 existing  
30 new

Wind Capacity (GW)

7.1 existing/committed  
8.3 new  
15.4 total



“I have spoken, so shall it be!”



# ORDER 1000

- Regional Requirements
  - Cost Allocation: Highway/Byway
  - Planning: Integrated Resource Planning process
  - ROFR
- Interregional Requirements
  - Cost Allocation
  - Planning
  - Dialogue ongoing with seams neighbors

# FERC Order 1000

- “On balance, the Commission concludes that the reforms adopted herein are necessary for more **efficient and cost-effective regional transmission planning**. As discussed further below, the electric industry is currently facing the possibility of substantial investment in future transmission facilities to meet the challenge of **maintaining reliable service at a reasonable cost**. The Commission concludes that it is appropriate to act now to ensure that its transmission planning processes and cost allocation requirements are adequate to allow public utility transmission providers to address these challenges more efficiently and cost-effectively.” P.8

# Objectives Order 1000

- “...the specific reforms adopted in this Final Rule are intended to achieve two primary objectives: (1) ensure that transmission planning processes at the regional level consider and evaluate, on a non-discriminatory basis, possible transmission alternatives and produce a transmission plan that can meet transmission needs more efficiently and cost-effectively; and (2) ensure that the costs of transmission solutions chosen to meet regional transmission needs are allocated fairly to those who receive benefits from them.” P 10

# SPP and FERC Order 1000

- Benefits of Transmission must exceed the costs.
- Traditional measures undervalue the benefits of transmission.
- Transmission costs are generally a small part of the consumers bill.

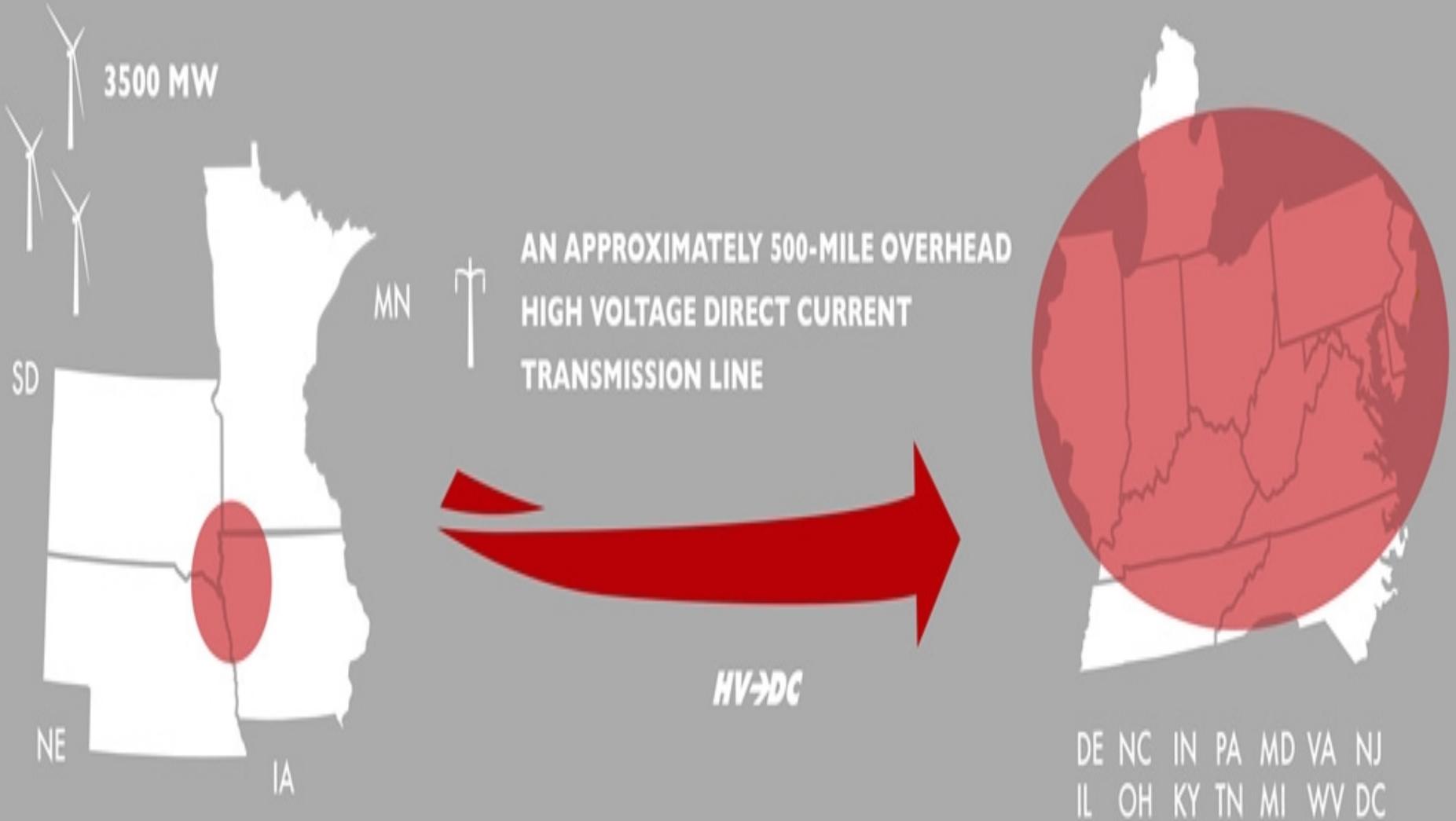
# Planning Requirements Overview

- Transmission Planning
  - Each public utility transmission provider must participate in a regional transmission planning process.
  - Each region must produce a single transmission plan under the principles of Order 890
  - Each region must consider the transmission needs driven by policies set by Federal, State and political subdivision requirements
  - Each region must have an agreement to plan with each adjoining region to address interregional transmission solutions

# Interregional Planning

- “In light of the comments received on this issue, the Commission in the Proposed Rule expressed concern that the lack of coordinated transmission planning processes across the seams of neighboring transmission planning regions could be needlessly increasing costs for customers of transmission providers, which may result in rates that are unjust and unreasonable and unduly discriminatory or preferential.” P. 272

# Clean Line HVDC



# N

# NEBRASKA

FOOTBALL VAULT



THANK YOU!

STEVE GAW

Wind Coalition

