Building Nebraska Needs into the Regional and National Grid

Nebraska Wind Energy Conference

Kearney, Nebraska

November 11, 2008

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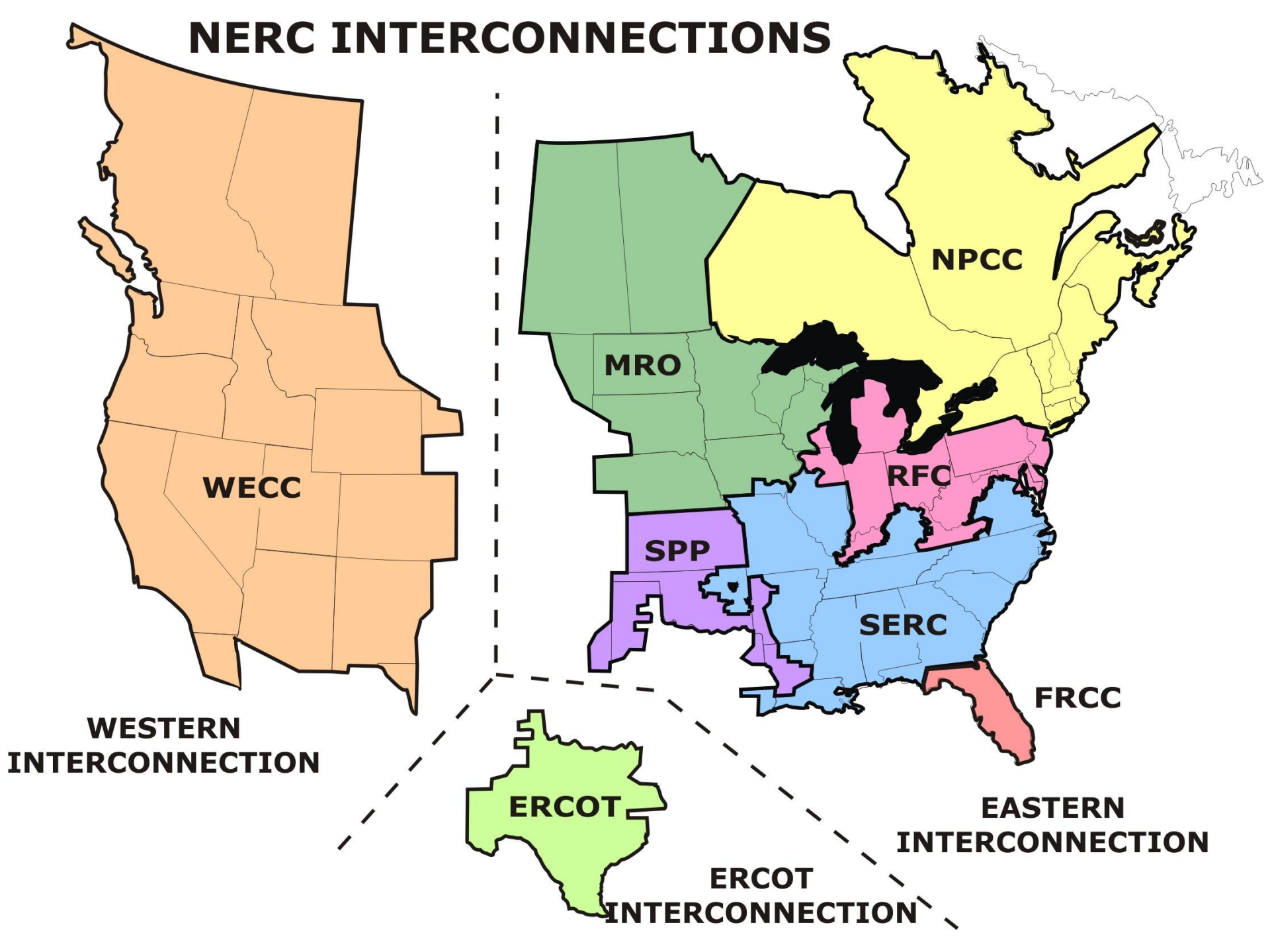
Presentation Topics

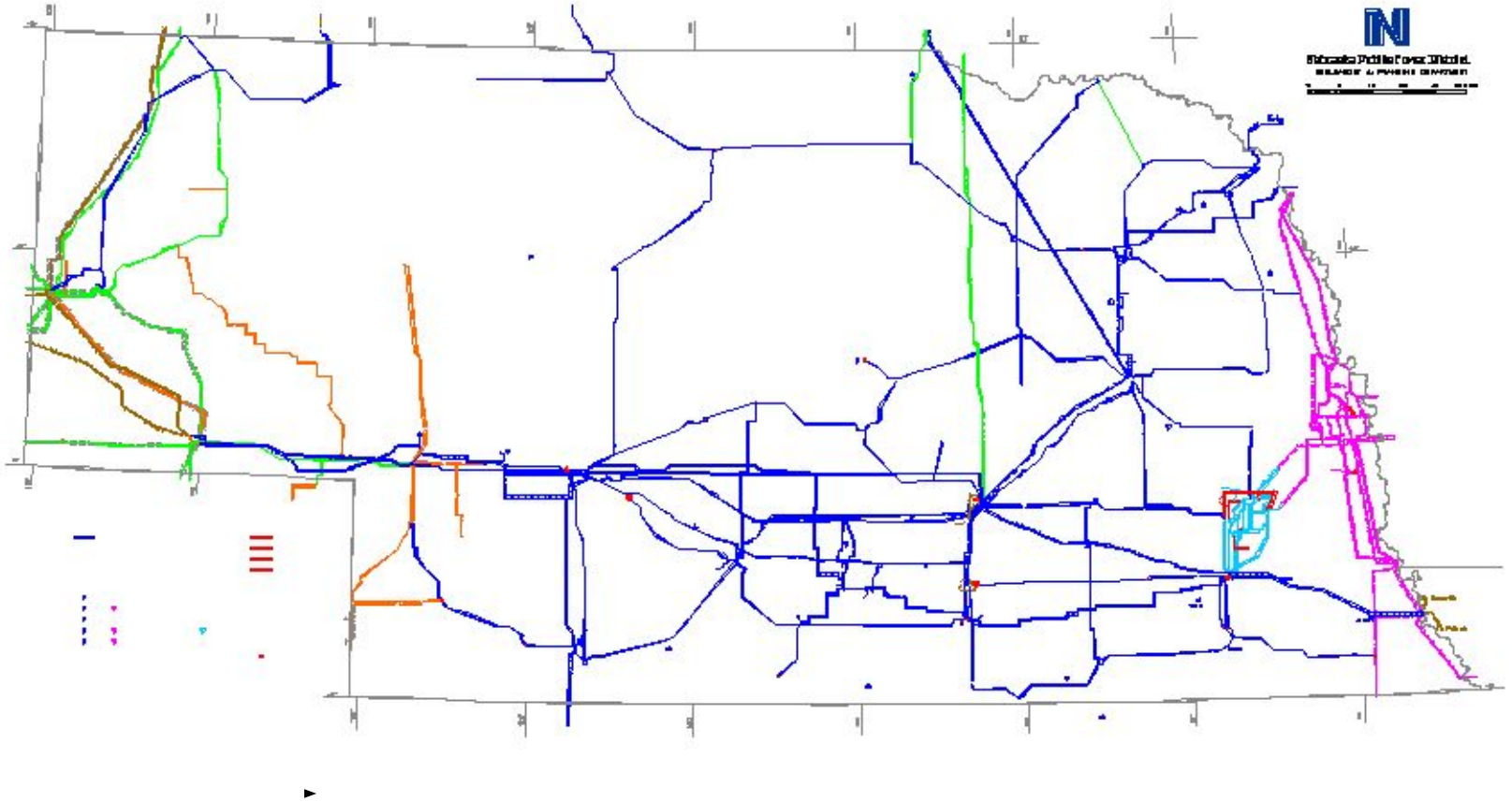
- The North American Transmission System – 3 separate Interconnections
- Functions of Nebraska's Transmission System
- Role of Regional Transmission Organizations
- Wind generation – new driver for transmission expansion
- Fundamental Issue– who pays for transmission expansion


NERC INTERCONNECTIONS
NPCC
MRO
RFC
WECC
SPP
SERC
FRCC
ERCOT
WESTERN INTERCONNECTION
EASTERN INTERCONNECTION
ERCOT INTERCONNECTION

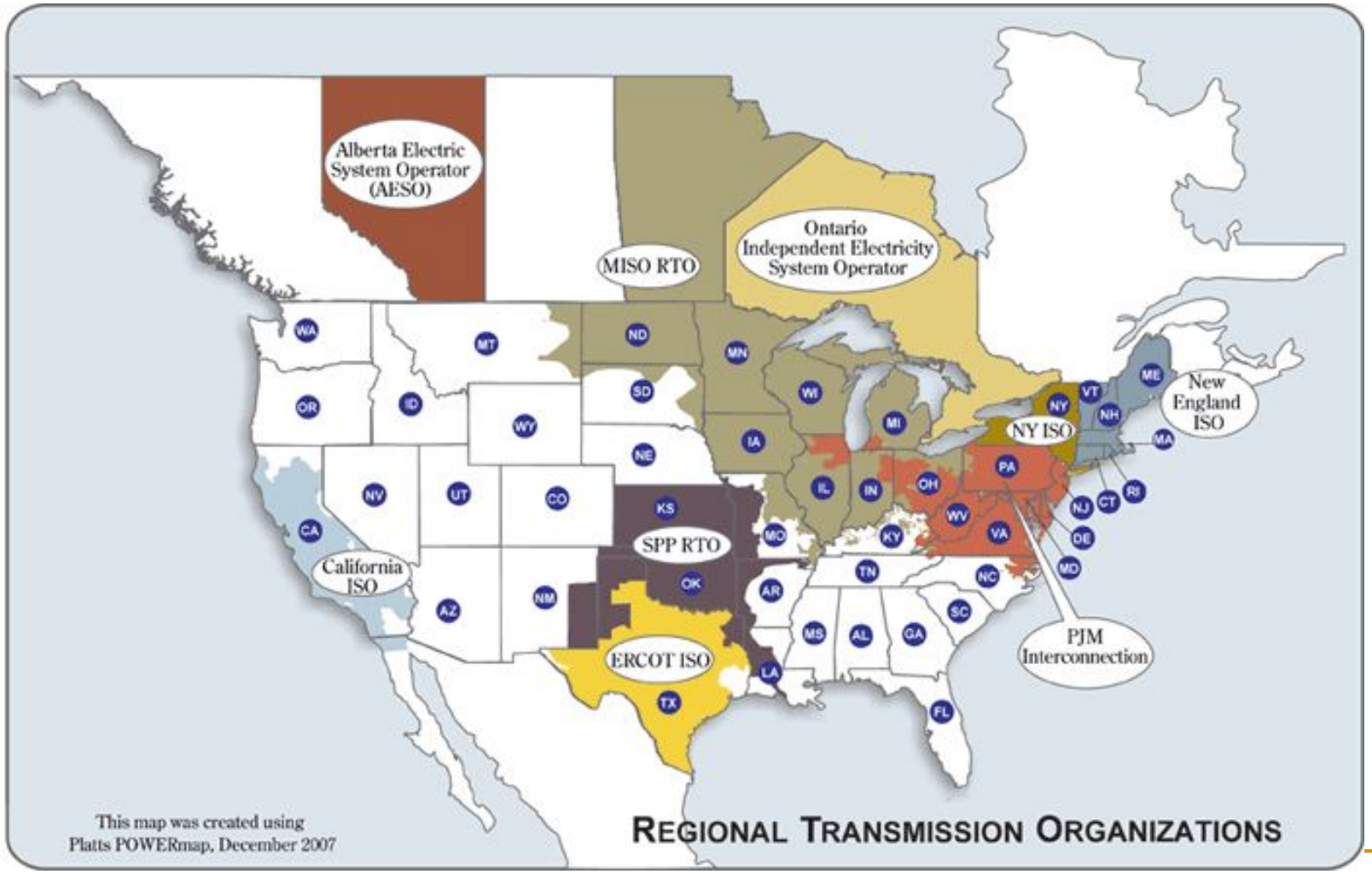
Primary Functions of Nebraska's Transmission System

- **Reliability – Network redundancy**
- Delivery of energy from the generators to the load (customers) centers
- Interconnections with neighboring states provides support for generation reserve sharing and limited transfer of energy across the region
- Western Nebraska – no transmission capacity for additional generation
- Transmission System was planned to serve local and regional needs, not national needs

Nebraska Transmission System



Regional Transmission Organizations (RTOs)

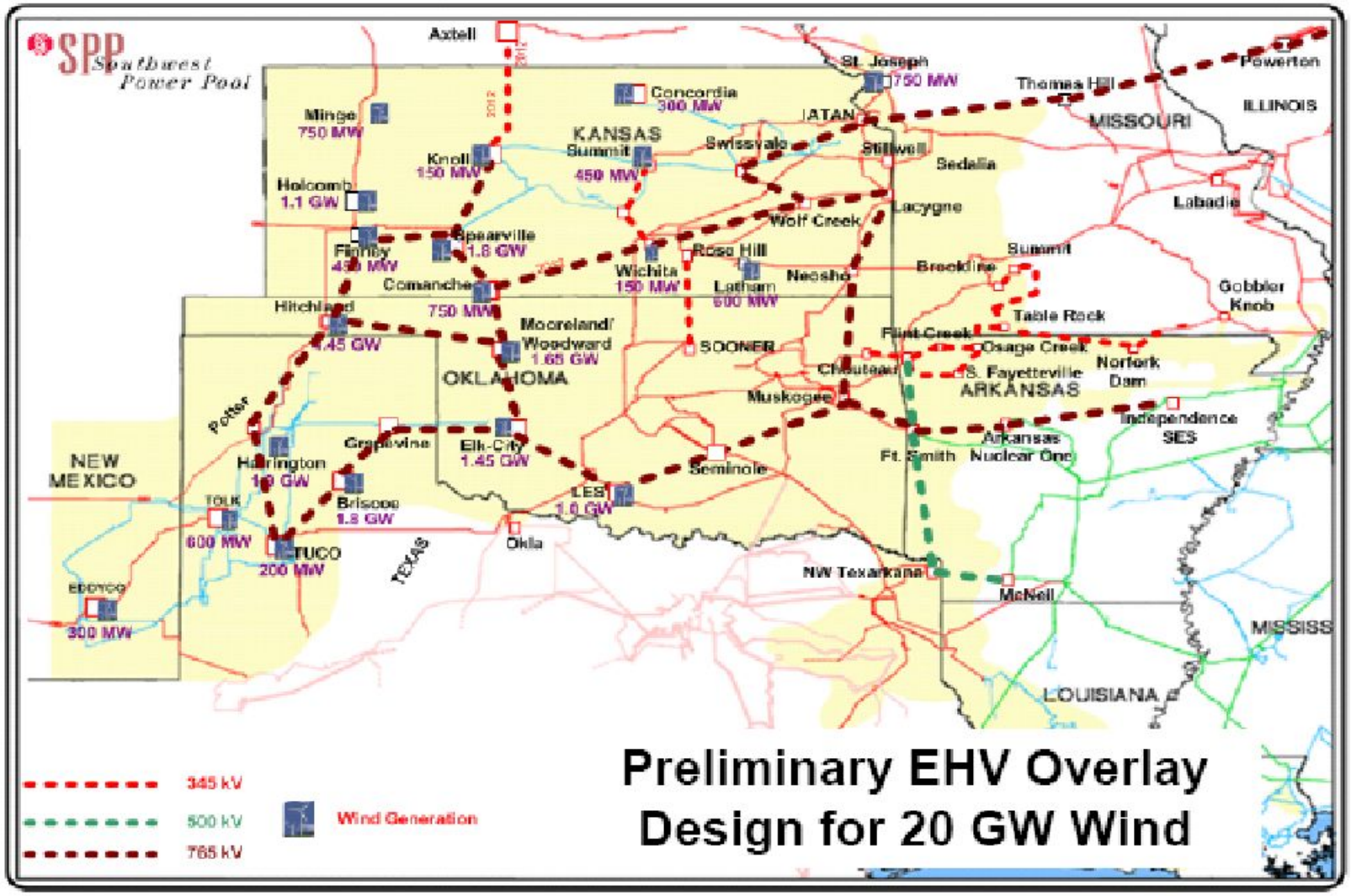


Role of Regional Transmission Organizations in Transmission Expansion

- Nebraska utilities intend to join the Southwest Power Pool (SPP) April 2009
- Each year SPP develops a 10 year region-wide transmission plan – start with a plan for each state
  - Reliability Projects – to serve new load
  - Economic Projects – to reduce congestion
  - Wind – transmission expansion for large scale wind development under consideration

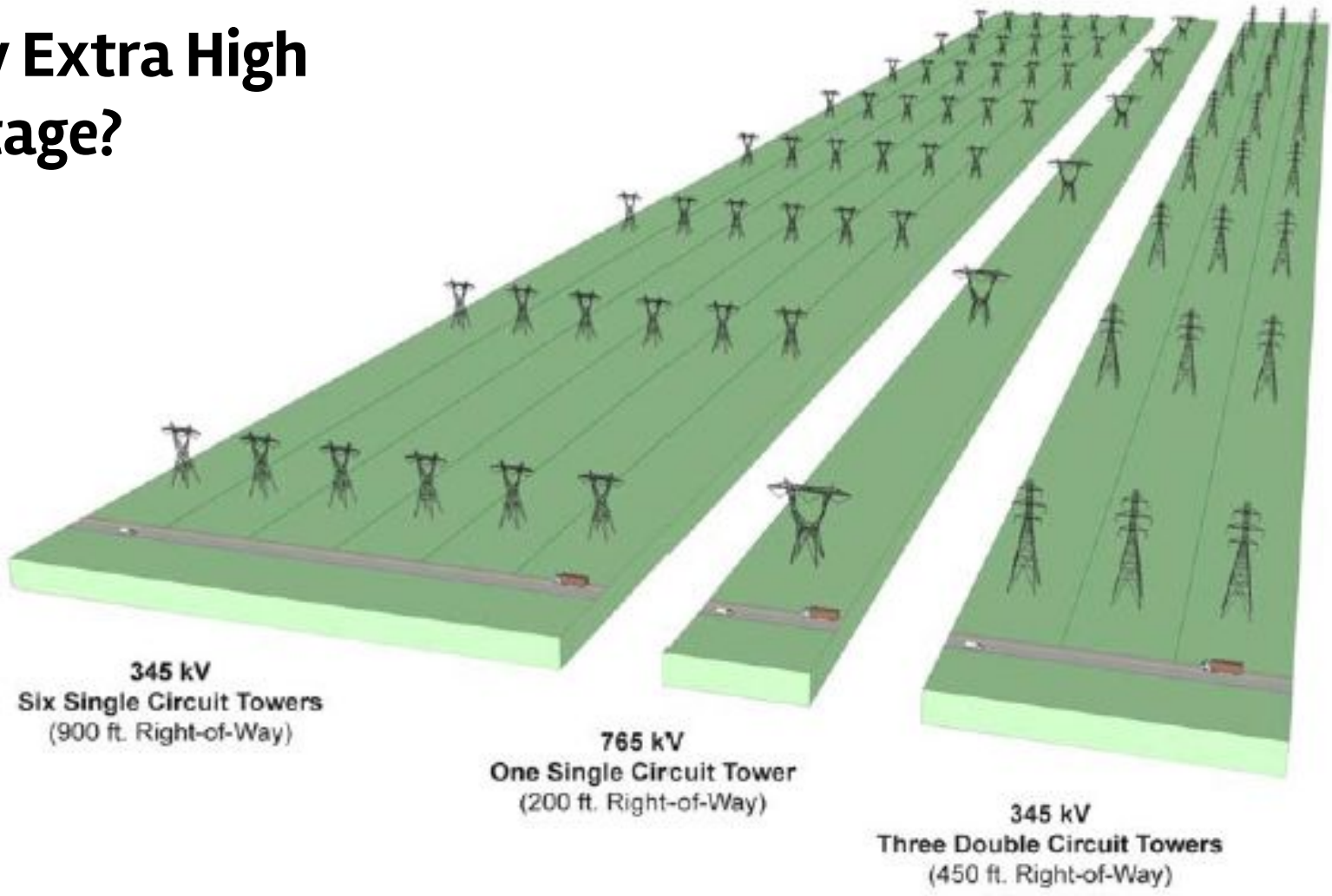
SPP – Transmission Planning for Wind

- Generator Interconnection Process
  - Submit a request – get in queue
  - Over 40,000 MW of wind in queue – equal to entire load in SPP
  - Sequential transmission study process doesn't work
- EHV Overlay Study
  - 765 kV network for 20,000 MW of wind
  - $ 7 billion
  - Need for ties to surrounding regions


SPP Southwest Power Pool
Axtell
Minge 750 MW
Knoll 150 MW
Holcomb 1.1 GW
Spearville 1.8 GW
Comanche 750 MW
Hitchland 1.45 GW
Potter
NEW MEXICO
Harrington 1.0 GW
TOLK 600 MW
Brisoe 1.8 GW
TUCO 200 MW
EDDYCO 300 MW
Grapevine
Elk City 1.45 GW
Okla
TEXAS
KANSAS
Summit 450 MW
Concordia 300 MW
Wichita 150 MW
Rose Hill
Latham 600 MW
Mooreland/ Woodward 1.65 GW
OKLAHOMA
SOONER
Seminole
LES 1.0 GW
Muskogee
Chouteau
Neosho
Wolf Creek
Lacygne
Swissvale
Stilwell
Sedalia
St. Joseph 790 MW
IATAN
Thomas Hill
Powerton
ILLINOIS
MISSOURI
Labadie
Summit
Brookline
Gobbler Knob
Table Rock
Flint Creek
Osage Creek
Norfork Dam
S. Fayetteville
ARKANSAS
Independence SES
Arkansas Nuclear One
Ft. Smith
NW Texarkana
McNeil
MISSISS
LOUISIANA
345 kV
500 kV
765 kV
Wind Generation
Preliminary EHV Overlay
Design for 20 GW Wind

National Transmission Grid (Cont'd)

Why Extra High Voltage?



Paying for Transmission Expansion

- Lack of a transmission pricing mechanism needed to support funding regional or national transmission facilities
  - 90+% of transmission revenue from wholesale and retail customers
- Postage Stamp rate – spread costs to all customers based on load
- SPP Cost Sharing for transmission expansion
  - Reliability Projects – 33% postage stamp
  - Economic Projects – 345 kV – 100% postage stamp
  - Wind Expansion – under consideration

Summary – why transmission is so important

- Nebraska transmission system capable of supporting small scale wind development
- Nebraska will have the opportunity to participate in transmission expansion for wind through membership in SPP
- Large Scale wind development in the plains states will require significant regional or national transmission expansion
- Need a funding mechanism that spreads the cost of new transmission across the region or nation
- If you support wind you have to like transmission