Helping our members work together to keep the lights on... today and in the future

SPP Southwest Power Pool

Modernizing America's Grid: What does it mean for New England?

Boston, MA

January 23, 2012

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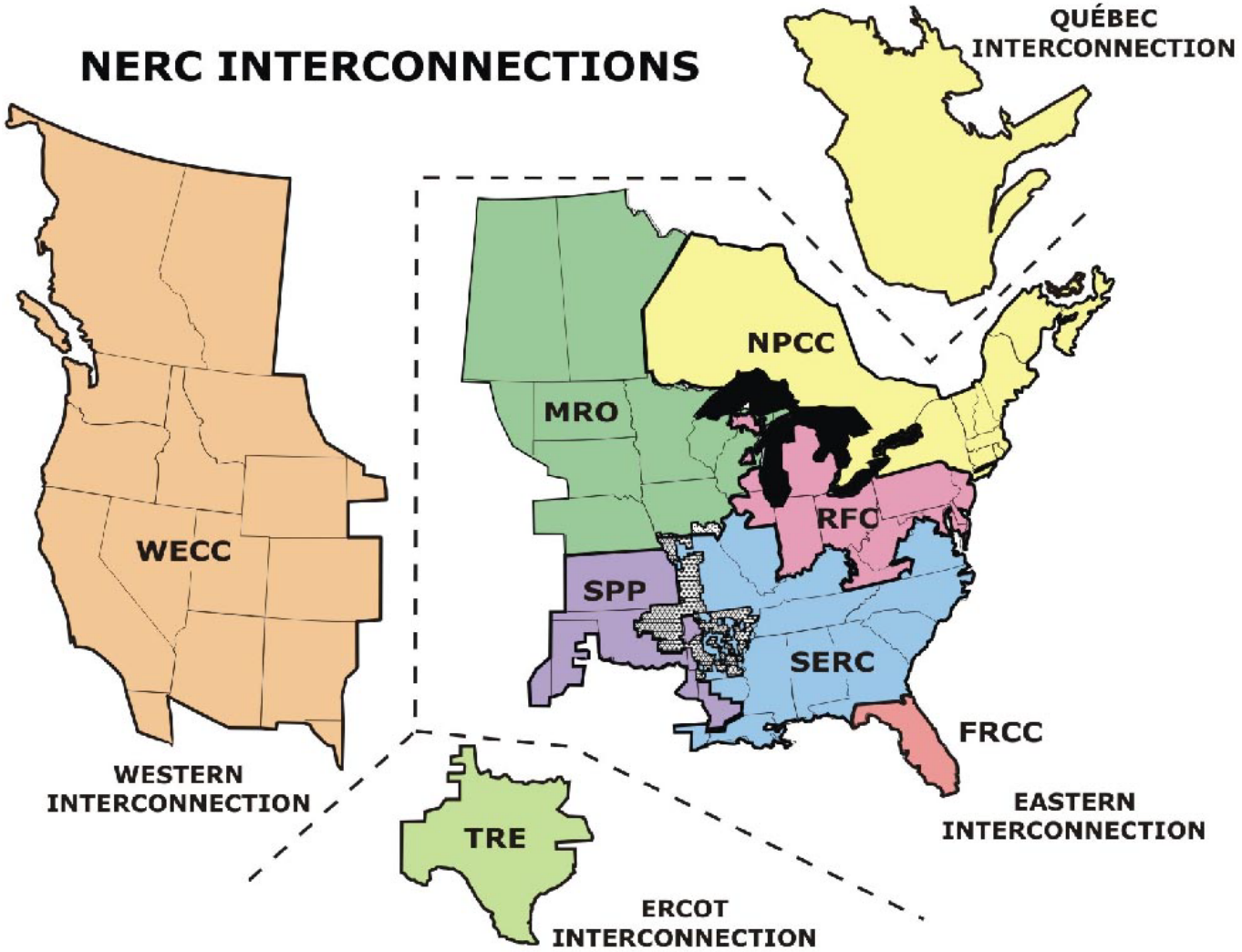
SPP Southwest Power Pool

SPP Mission

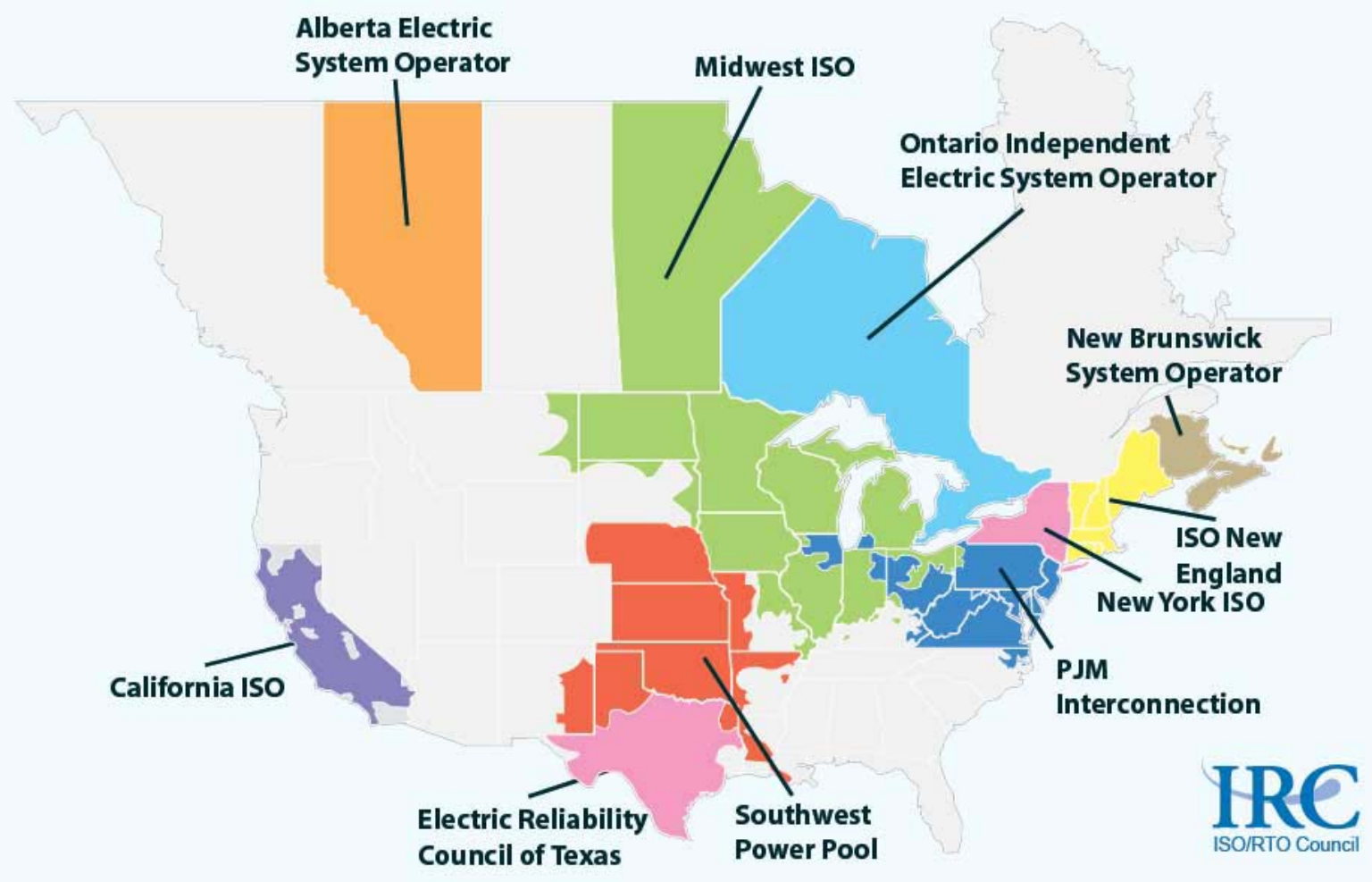
Helping our members work together to keep the lights on – today and in the future.

Updated Oct. 9, 2009

3 Interconnections / 8 NERC Regions

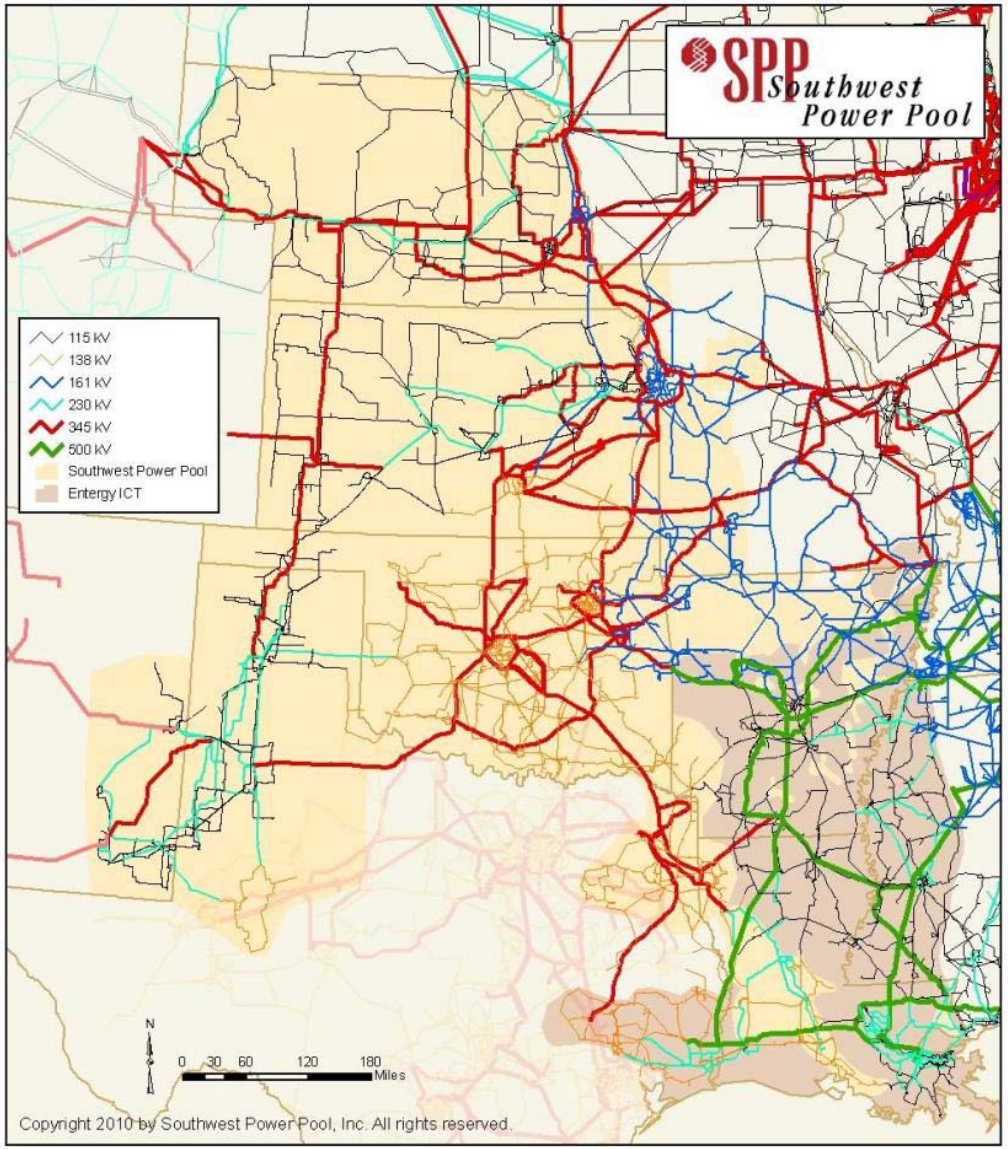


ISO / RTO Map

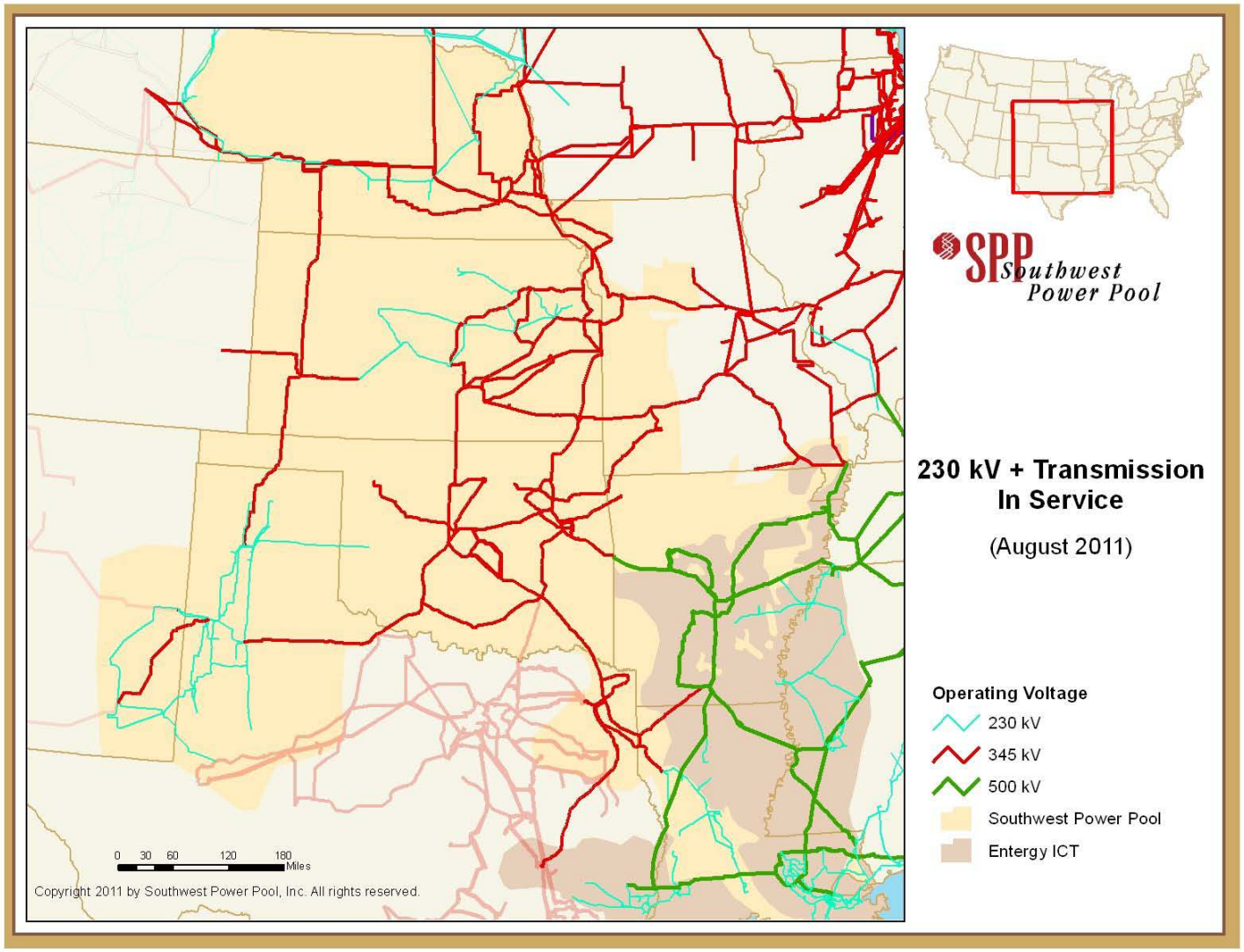

Alberta Electric System Operator
Midwest ISO
Ontario Independent Electric System Operator
New Brunswick System Operator
ISO New England
New York ISO
PJM Interconnection
California ISO
Electric Reliability Council of Texas
Southwest Power Pool
IRC
ISO/RTO Council

SPP Region

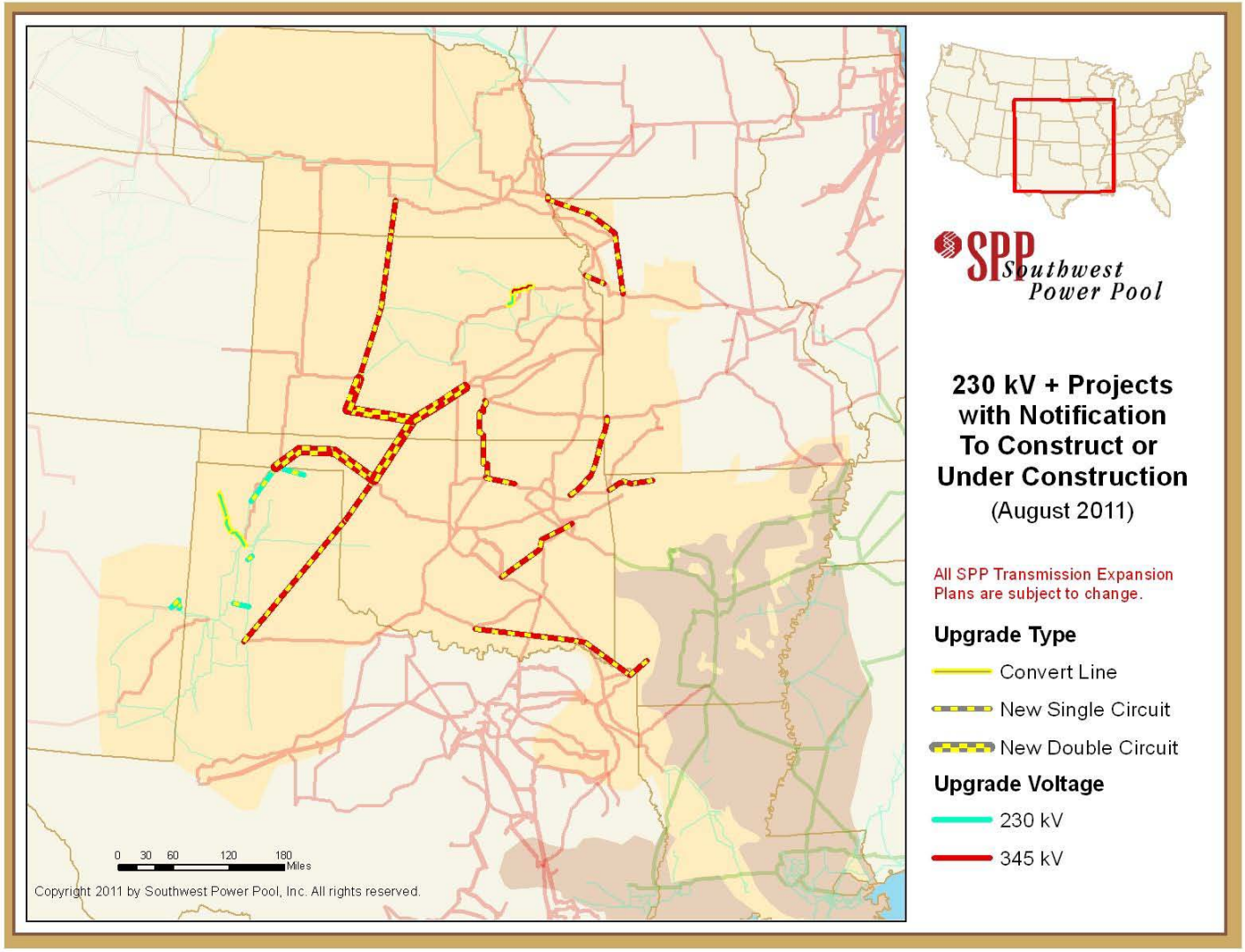
- 370,000 square miles service territory
- 859 generating plants
- 6,101 substations
- 48,930 miles transmission:
  - 69 kV – 12,722 miles
  - 115 kV – 10,143 miles
  - 138 kV – 10,009 miles
  - 161 kV – 5,097 miles
  - 230 kV – 3,787 miles
  - 345 kV – 7,079 miles
  - 500 kV – 93 miles



SPP EHV (230 kV+) Transmission

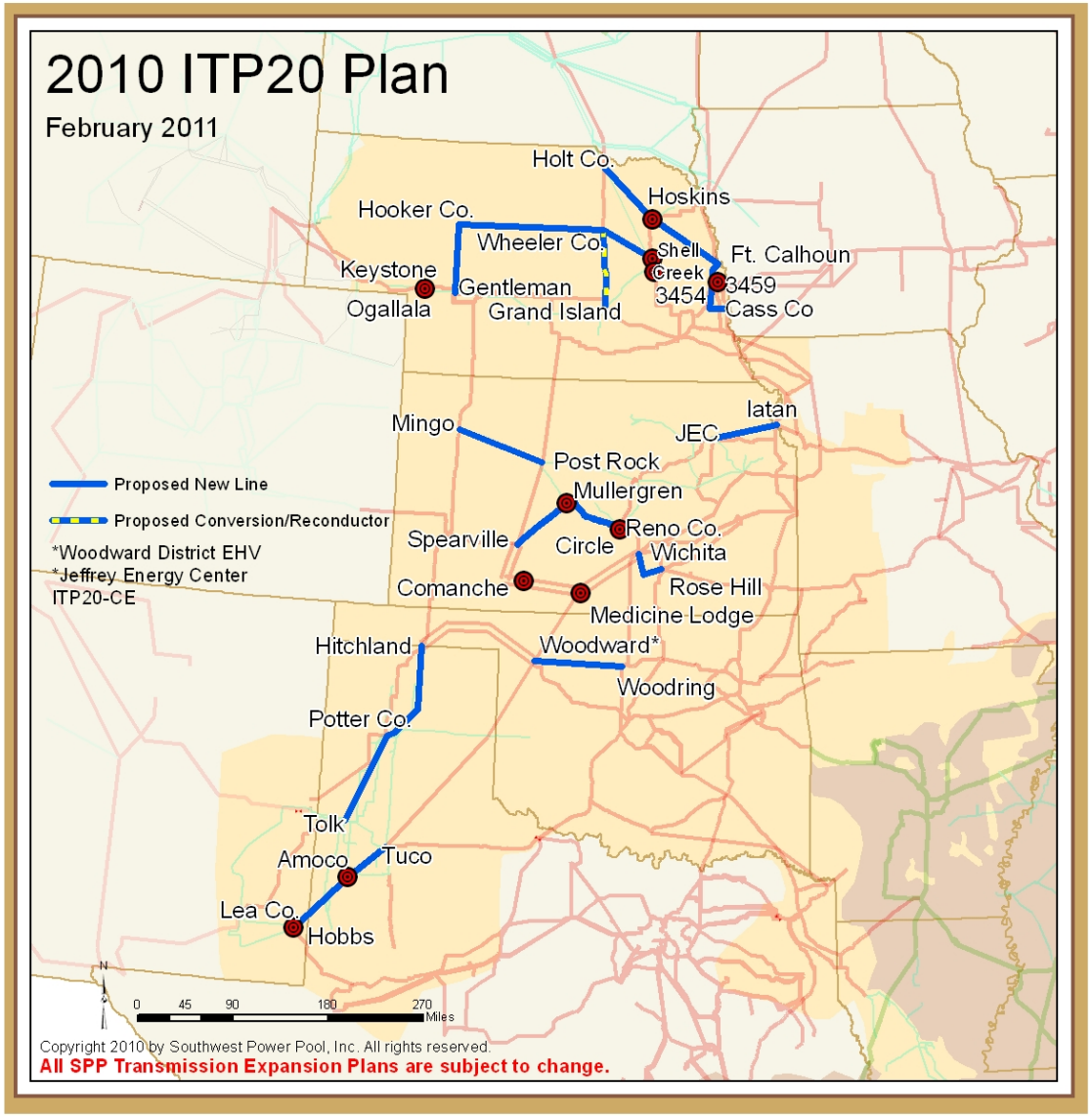


Approved SPP EHV Projects



SPP Transmission Planning Process

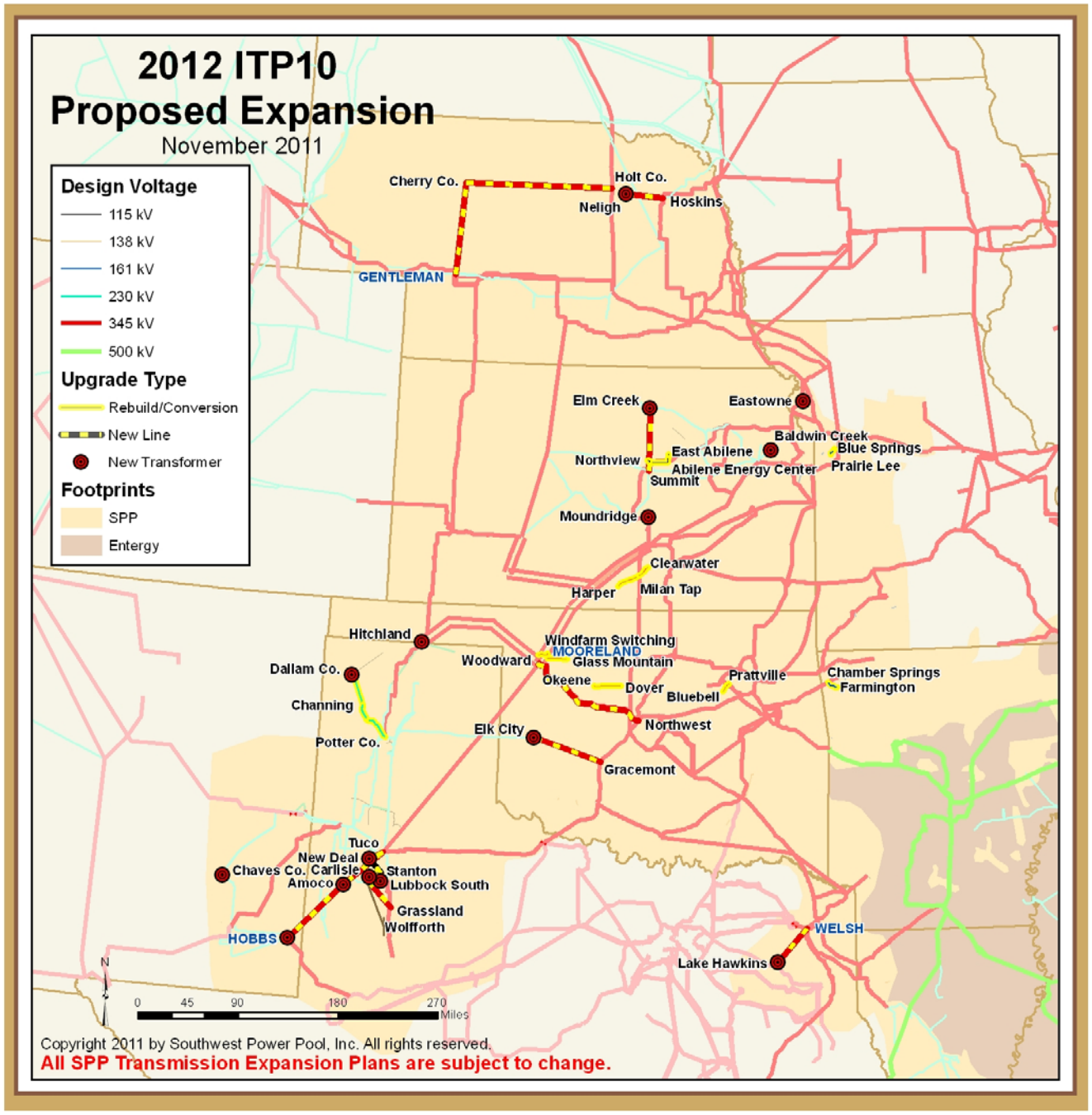
- **Integrated Transmission Planning (ITP)**
  - Iterative approach to planning with long term blueprints, 10 year approved plans, as well as near term assessments
  - Balancing objectives and facilitating future generation interconnection and transmission service requests
- **Major effort driven by core SPP value proposition that "Reliability and Economics are Inseparable"**
  - Focuses on regional projects, integrated with local needs
  - Projects for SPP region over next 20 years



Total 2010 ITP20 E&C = $1.8B

Total 40-Year APC B/C = 5.22

Robustness Score (Weighted) of 277


2012 ITP10
Proposed Expansion
November 2011
Design Voltage
115 kV
138 kV
161 kV
230 kV
345 kV
500 kV
Upgrade Type
Rebuild/Conversion
New Line
New Transformer
Footprints
SPP
Entergy
Cherry Co.
Holt Co.
Neligh
Hoskins
GENTLEMAN
Elm Creek
Eastowne
Baldwin Creek
Blue Springs
Northview
East Abilene
Abilene Energy Center
Prairie Lee
Summit
Moundridge
Clearwater
Harper
Milan Tap
Hitchland
Windfarm Switching
MOORELAND
Woodward
Glass Mountain
Dallam Co.
Okeene
Dover
Prattville
Chamber Springs
Farmington
Bluebell
Channing
Northwest
Elk City
Potter Co.
Gracemont
Tuco
New Deal
Chaves Co.
Carlisle
Stanton
Amoco
Lubbock South
Grassland
Wolfforth
HOBBS
WELSH
Lake Hawkins
N
0
45
90
180
270
Miles
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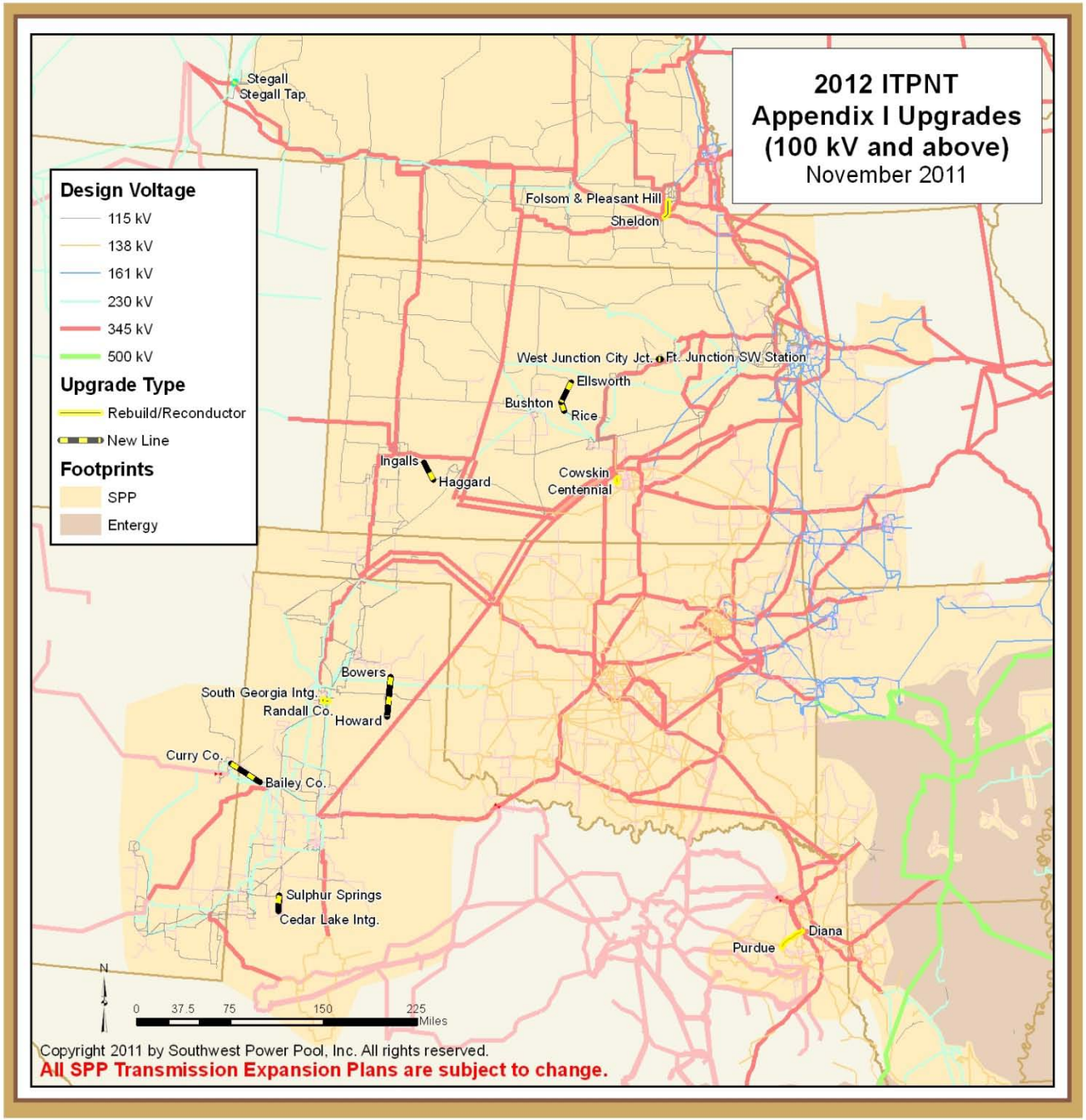
All SPP Transmission Expansion Plans are subject to change.


2012 ITPNT
Appendix I Upgrades
(100 kV and above)
November 2011
Design Voltage
115 kV
138 kV
161 kV
230 kV
345 kV
500 kV
Upgrade Type
Rebuild/Reconductor
New Line
Footprints
SPP
Entergy
Stegall
Stegall Tap
Folsom & Pleasant Hill
Sheldon
West Junction City Jct.
Ft. Junction SW Station
Ellsworth
Bushton
Rice
Ingalls
Haggard
Cowskin
Centennial
Bowers
South Georgia Intg.
Randall Co.
Howard
Curry Co.
Bailey Co.
Sulphur Springs
Cedar Lake Intg.
Purdue
Diana
N
0 37.5 75 150 225
Miles
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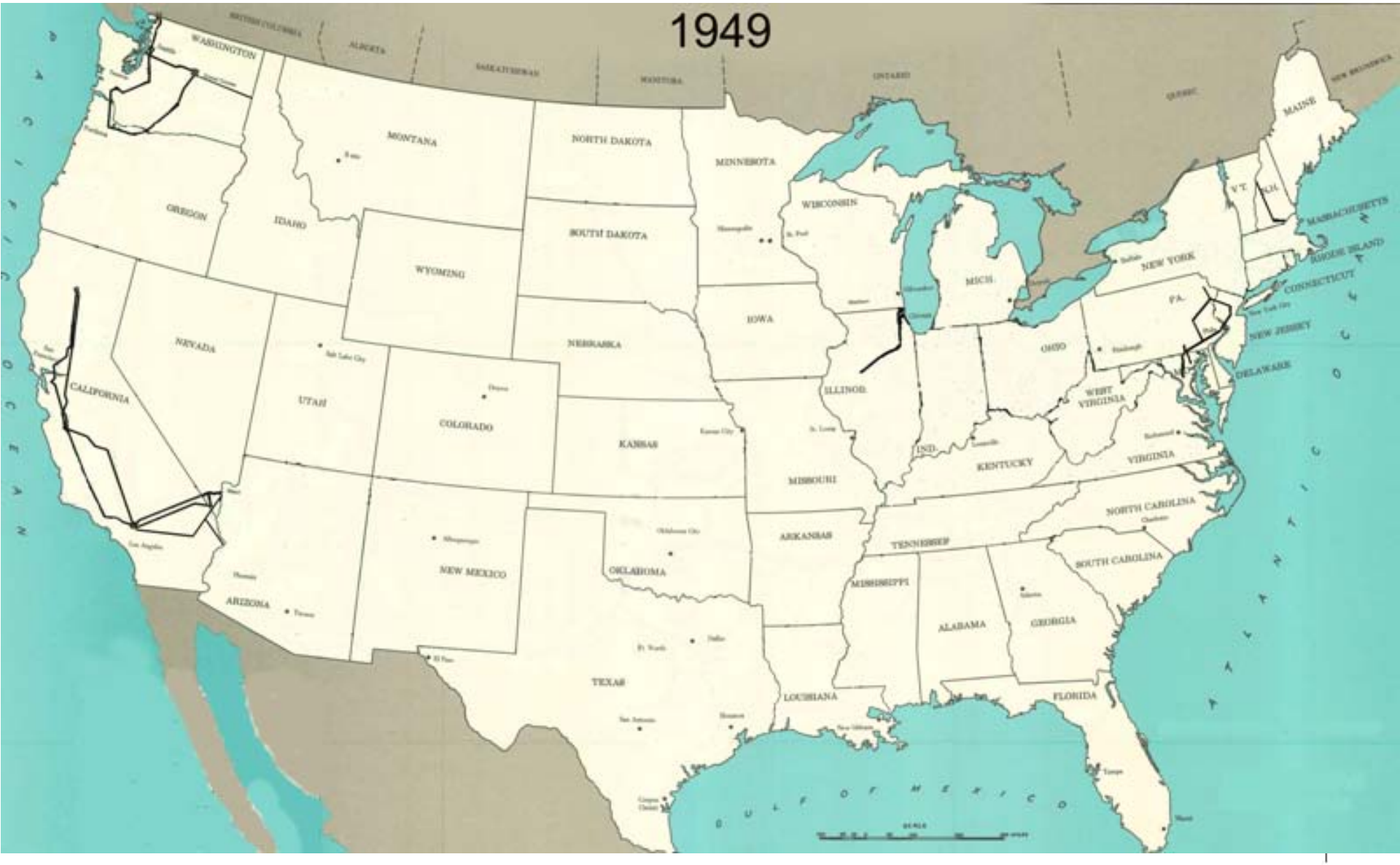
All SPP Transmission Expansion Plans are subject to change.

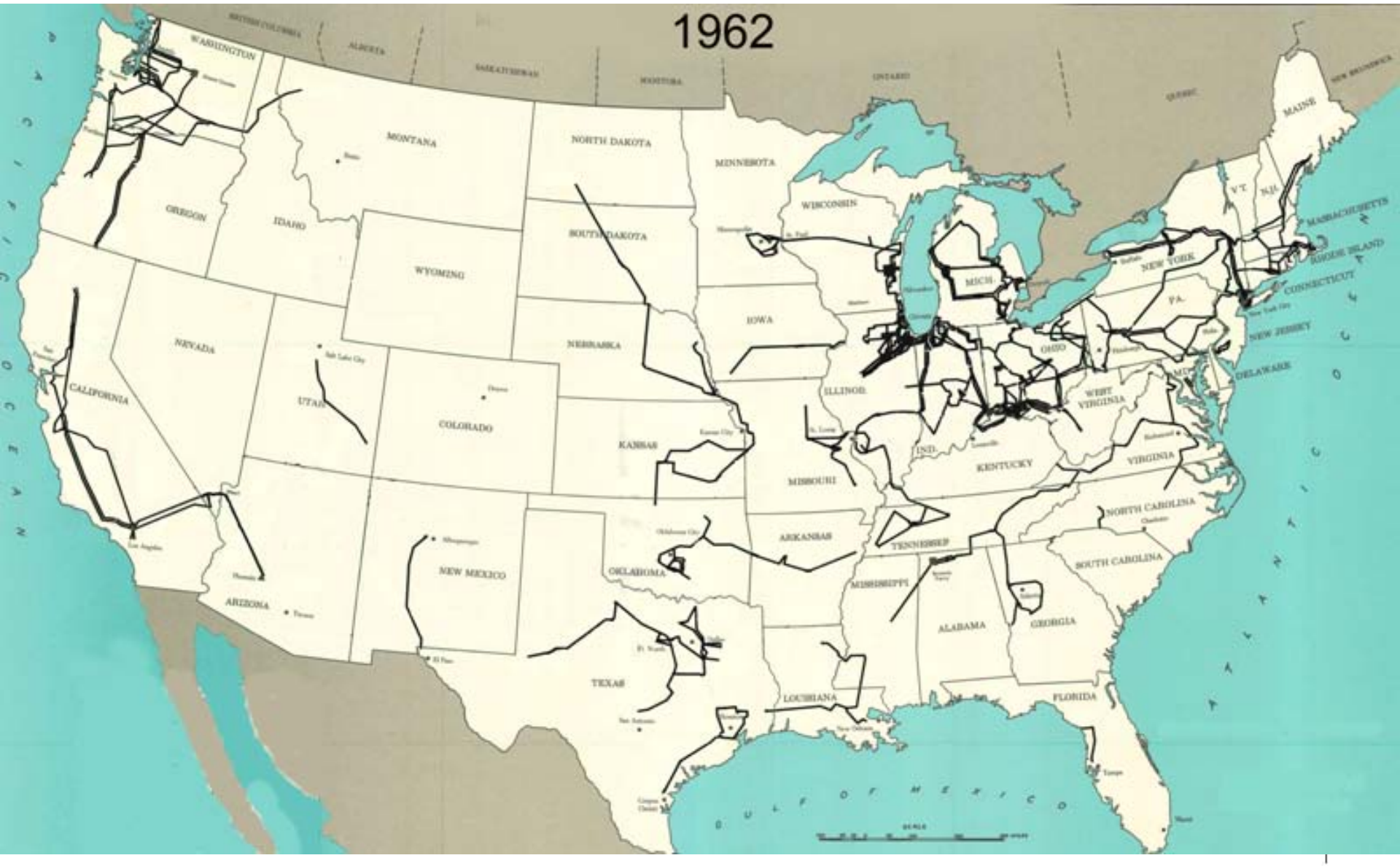
Future in SPP

- Renewable development beyond member needs of 10-14GW in SPP will depend on level of exports. While focus to date has been wind, solar will be next, then…
- Asset management with aging infrastructure will be a challenge. Effective use of new and existing Rights-Of-Ways (ROWs) will be key success factor in getting the best lines in the best corridors
- Future is bright with more robust planning and certainty of cost allocations, but we may need smart grid applications to minimize renewable curtailments in advance of grid build-out and to manage flows using new technology, e.g., HVDC, as well as system reconfiguration/ optimization tools

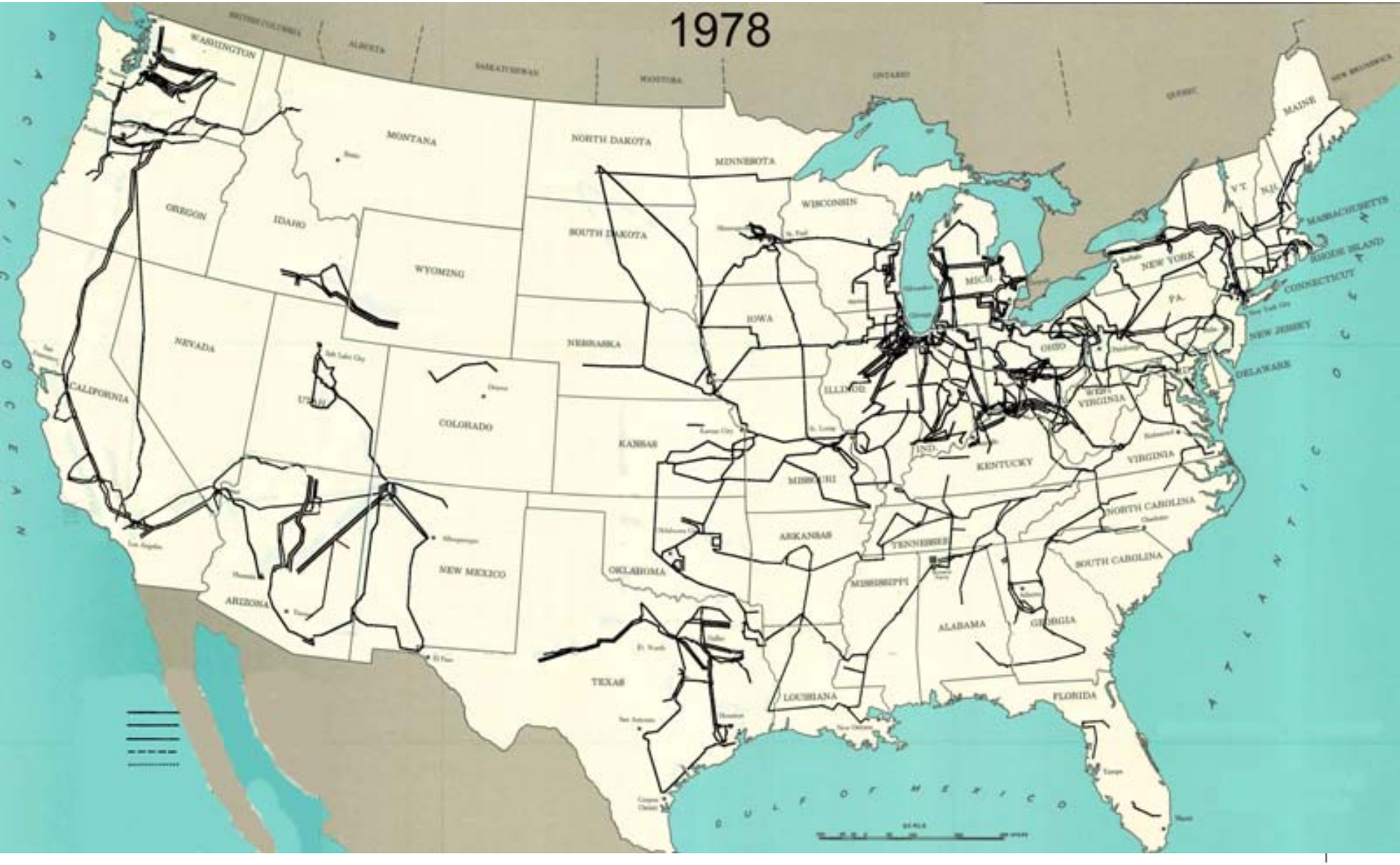
345 kV+ Transmission Growth at a Glance



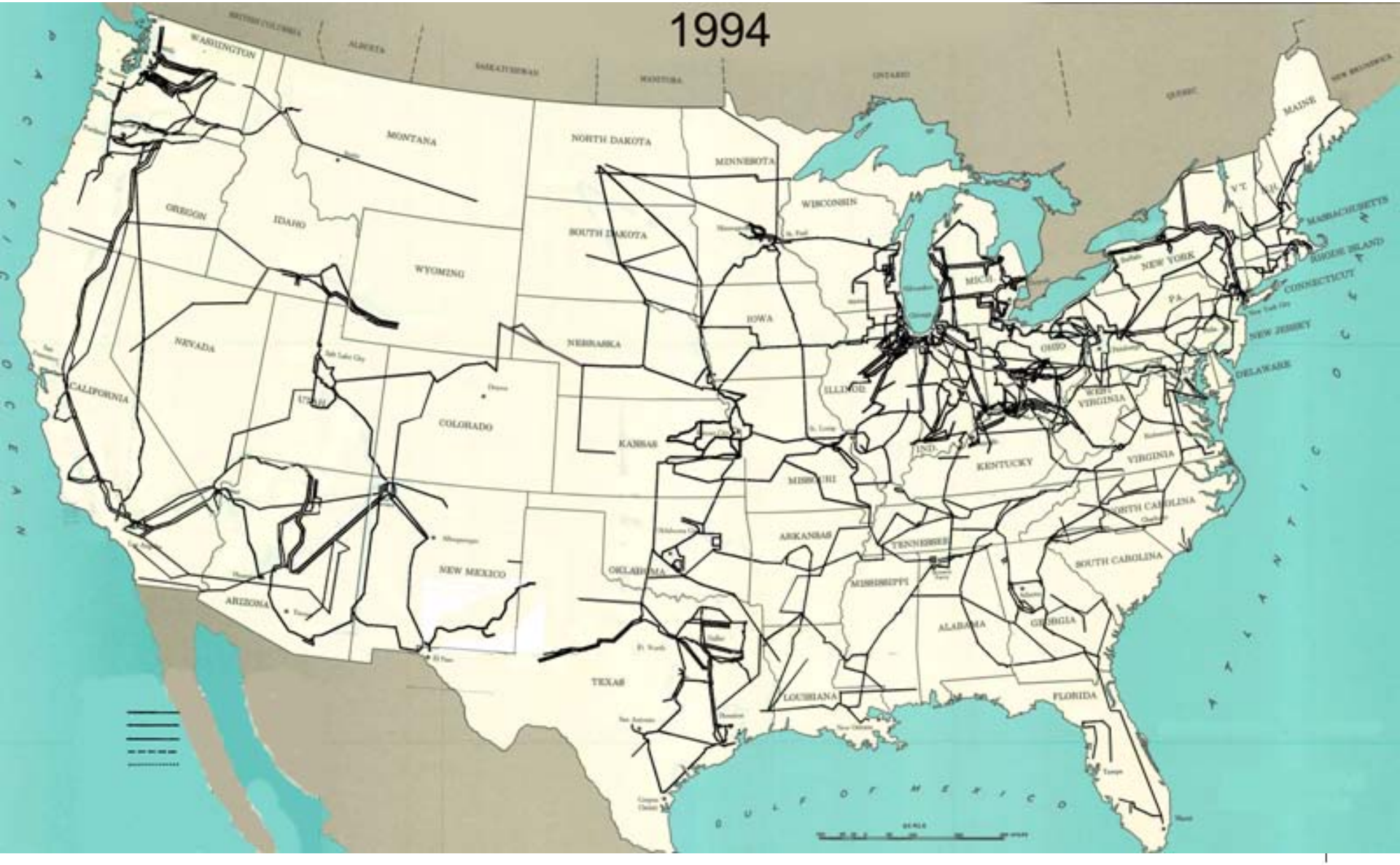
345 kV+ Transmission Growth at a Glance



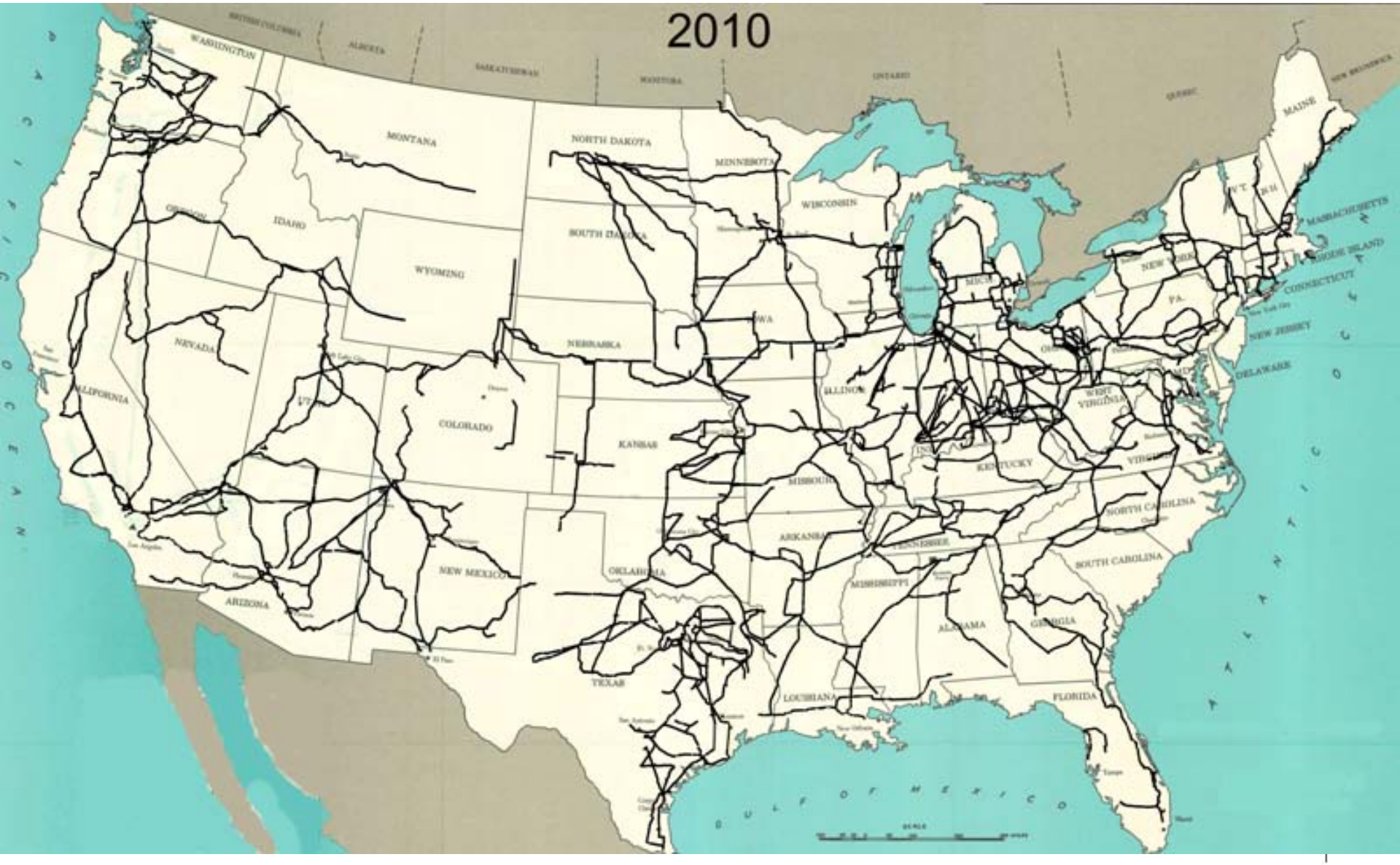
345 kV+ Transmission Growth at a Glance



345 kV+ Transmission Growth at a Glance



345 kV+ Transmission Growth at a Glance



Collaboration with Neighbors

- FERC Order 1000 will help facilitate interregional planning with compliance plans due in April 2013, if we can avoid a focus on litigation and minimalistic requirements only
- Interconnection wide planning studies like the Eastern Interconnection Planning Collaborative (EIPC) are a good step forward, but need to evolve beyond data sharing and exercises to inform regional plans
- Several large HVDC lines are being proposed to move SPP wind to adjacent markets including MISO & TVA.
  - Merchant projects may drive, and not necessarily compliment, optimal interregional plans

Interregional Studies of Interest

- EIPC Phase I report posted, Phase II in process with initial Transmission Options Task Force meeting this month focusing on model development and transmission buildouts to support 3 scenarios
- DOE's 2012 Congestion Study underway with regional technical conferences completed last month
- Power System Engineering Research Center (PSERC) National Grid Initiative focusing on energy infrastructure needs for 2050

Key Points

- Transmission enables, and defines, markets
- Transmission provides benefits that are not easily quantified, e.g., resource optionality via robust and flexible plans provide tremendous value
- Transmission is lumpy, with large economies of scope and scale
- Smart grid applications for transmission could be game changers
- Interregional planning needs to capitalize on replacement and rightsizing, where appropriate, of aging infrastructure in critical corridors

"If we all did the things we are capable of doing, we would literally astound ourselves."

THOMAS A. EDISON (1847-1931)