

Energy Development and Transmission Committee

Curtis Jabs
Acting Director

North Dakota Transmission Projects

- Center to Grand Forks Line – Minnkota, 345kV
- Cap X 2020 Project – Fargo to St. Cloud, 345kV
- Western North Dakota – Basin Electric, 345kV
- Big Stone South to Ellendale – MDU and OTPC
345kV

Western Area Power Administration (Western) Basin Electric Power Cooperative (Basin Electric)

- Entertaining joining a region transmission organization (RTO)
- Integrated System (IS)
- Energy Policy Act of 2005
- Two RTO's – Midwest Independent System Operator (MISO) and Southwest Power Pool (SPP)
- Could be some seams issues between ND MISO members if SPP chosen.
- Western and Basin Electric view the outlook positive to get more ND transmission built.

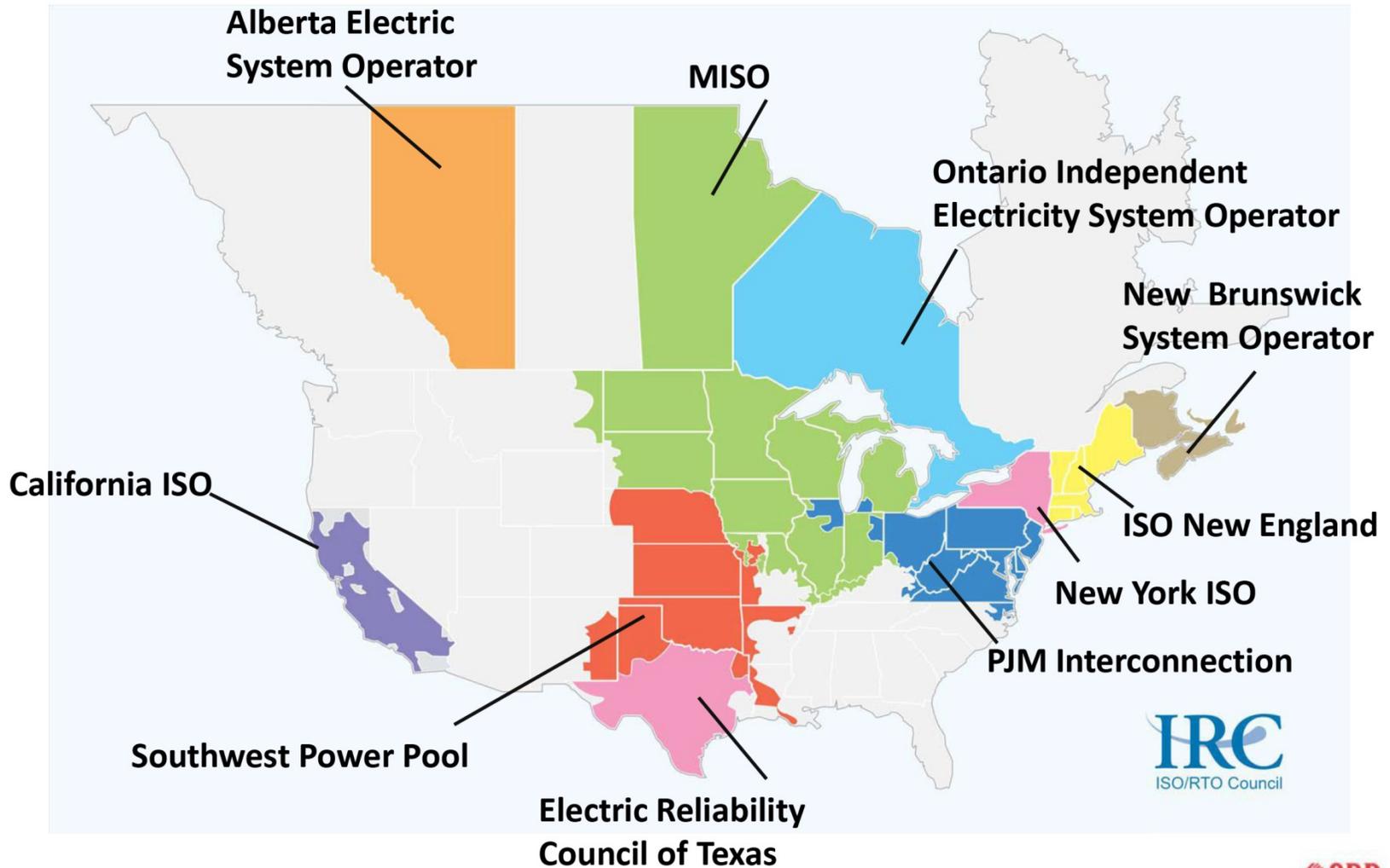
Western Area Power Administration



Regions

- Corporate Services
- Colorado River Storage
- Desert Southwest
- Rocky Mountain
- Sierra Nevada
- Upper Great Plains

Independent System Operator (ISO) / Regional Transmission Organization (RTO) Map



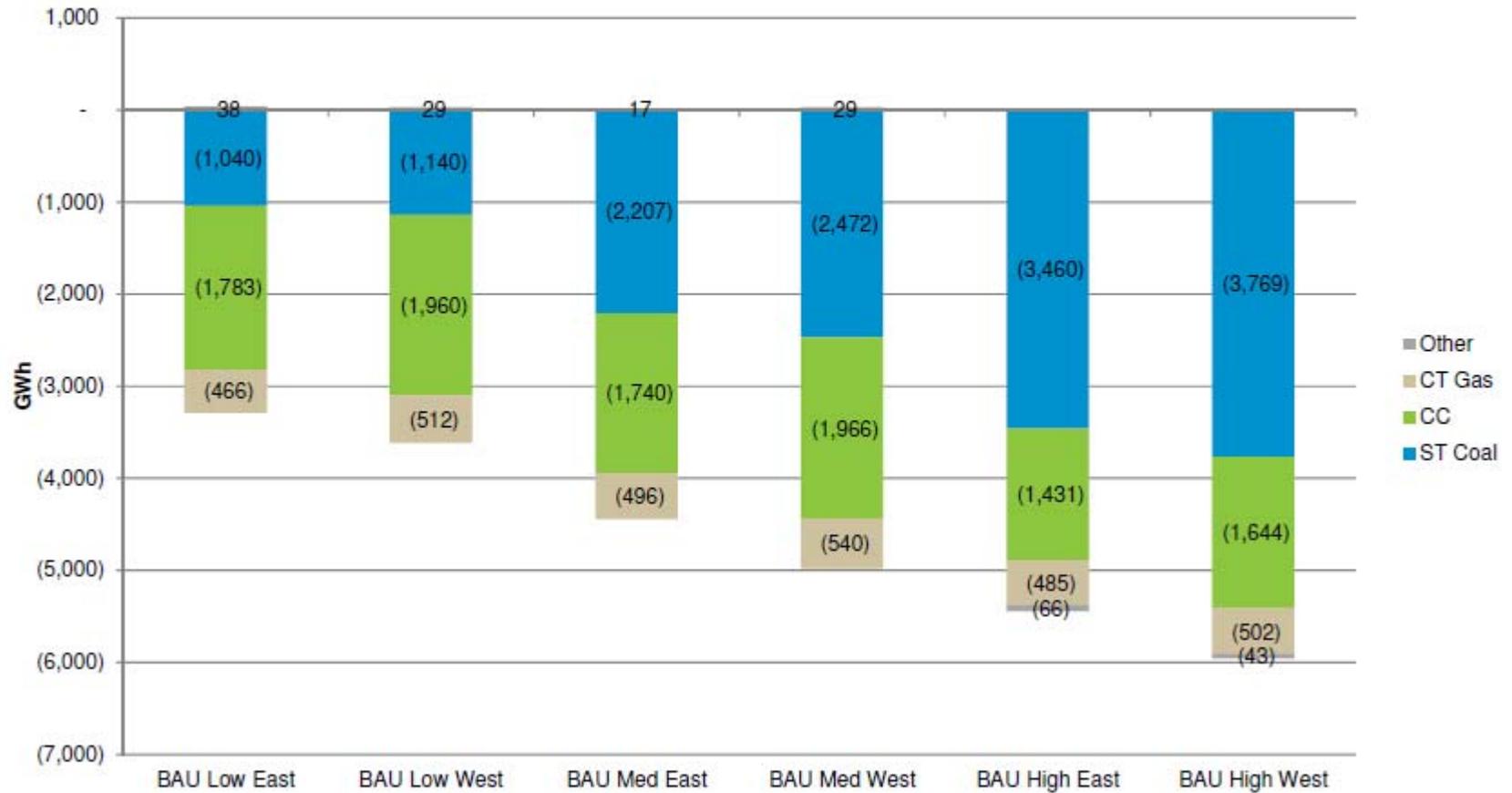
Manitoba Hydro Study

- **Manitoba Hydro Wind Synergy Study - Drivers**
- **The variable and non-peak nature of wind creates integration challenges within MISO**
 - 13 GW wind online, 17 GW active wind projects in Queue
- **Manitoba Hydro (MH) system can be considered as a super-sized pumped storage plant:**
 - Very low minimum load
 - Very fast ramping rate
- **Stakeholders requested MISO to study the potential of MH system.**
 - 5,700 MW existing generation, 4,500 MW winter peaking demand
 - 1,850 MW export capability to MISO
 - 2,100 MW new hydro generation in next 15 years

Manitoba Hydro Study



MISO Generation Displaced



New MH hydro units mostly displace MISO base load units.

Northern Area Study

Driver: Multiple proposals by stakeholders & reliability issues located in MISO's northern footprint

- **Objective is to conduct a comprehensive study to:**
 - Identify the economic opportunity for transmission development in the area.
 - Evaluate the reliability & economic effects of drivers on a regional, rather than local, perspective
 - Develop indicative transmission proposals to address study results with a regional perspective
 - Identify the most valuable proposal(s) & screen for robustness

Northern Area Study

Best-Fit Portfolios

1. Upgrade Hankinson – Wahpeton 230kV & Big Stone – Morris 115kV, Kewaunee – Ludington 500kV DC
2. Upgrade Hankinson – Wahpeton 230kV & Big Stone – Morris 115kV, National/Arnold – Livingston 345kV
3. Upgrade Hankinson – Wahpeton 230kV & Big Stone – Morris 115kV, Marquette – Mackinac County 138kV

Northern Area Study

Next Steps

- Northern Area Study is an exploratory study; results will determine and feed additional studies.
- Most cost-effective options from Northern Area Study currently being studied in the MISO Transmission Expansion Planning (MTEP13) and Market Efficiency Planning Study.

Questions